

INDUSTRIAL LOCATION IN THE DEVELOPING COUNTRIES:
THE ACCRA PLAINS (GHANA)

by

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ABSTRACT

The purpose of the study is to show that only predetermined industrial location within a regional framework will assist the developing countries to achieve their industrialization goals. The study of this regional approach to industrial location in the developing countries is undertaken because it is felt that location of industries is one of the problems of the industrialization process in the developing countries, and that there is a need for an approach which the developing countries can use to achieve their industrialization goals of full employment, higher income per capita, and earning or saving foreign exchange.

In order to investigate this regional approach to industrial location, it is necessary to make some preliminary considerations of the various concepts involved. The term 'the developing countries' is defined, and the role of industrialization in economic development of these countries is indicated. Location of industries is shown as one of the problems of industrialization, and methods of analyzing the problem of industrial location are examined. The importance of the concept of predetermined industrial location within a regional framework necessitates a review of the concept and its application in Puerto Rico.

These preliminary considerations form the basis of the appreciation of the problems of industrial location, which the developing countries must consider in their

national industrial development policies. These problems are: the selection of industries and of industrial locations, and the provision of the facilities necessary to support industrial locations.

The consideration of the problems of industrial location provides an opportunity for relating the regional approach to industrial location to the case study area, namely, the Accra Plains in Ghana. In this regard, Ghana's national industrialization goals are identified; the settlement pattern, the economy and the resources of the region are examined to show the extent to which industries could be developed to achieve the national industrialization goals. A regional plan prepared for this region is also evaluated. It is observed that the planning consultants recommended industrial concentration only in four large urban centres in Ghana with complete disregard for the smaller urban centres and the rural areas, and that the implementation of such a recommendation would tend to widen further the existing gap between the living standards of the people in these large urban areas and the rest of the country. Only these four centres were selected as points of industrial concentration because industrial location was predetermined within a national framework. It is concluded that only predetermined industrial location within a regional framework will assist Ghana to achieve her industrialization goals, since the use of such an approach would enable the country to examine the resources and the needs of all the urban and the rural areas.

It is emphasized that although the regional approach to industrial location will assist the developing countries to achieve their industrialization goals, nevertheless this approach must take cognizance of the national development goals and be related to local economic, social, and physical conditions.

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CHAPTER I

THE DEVELOPING COUNTRIES AND INDUSTRIAL LOCATION

In order to orient the reader with reference to the general subject of industrial location in the developing countries, the main body of this study is prefaced by a discussion of a general nature. The discussion which follows defines the term 'the developing countries' and considers the role of industrialization in their economic development. Industrial location is regarded as a problem of industrialization and methods are considered for analyzing the problem.

THE DEVELOPING COUNTRIES

Until quite recently, the countries of Latin America, Africa, and Asia were described as 'under-developed countries' especially by international bodies, such as the United Nations, and by development economists. All of these various groups defined the term 'under-developed countries' differently. For instance, a group of the United Nations experts defined the term as follows:

We use the term 'under-developed countries' to mean countries in which per capita real income is low when compared with the per capita real incomes of the United States, Canada, Australasia and Western Europe. In this sense an adequate synonym would be 'poor countries'.¹

¹United Nations. Measures for the Economic Development of Under-Developed Countries. New York. United Nations. 1951, p. 3.

Following Almeida Magalhaes' discussion of the economies of under-developed countries, Dr. Loeb, a development economist, describes 'under-developed countries' as "those countries which, given the available natural and human resources, have been backward in employing economically feasible modern techniques".² Without going into the analysis of the realism of these definitions it can be said that the use of the term 'under-developed countries' to describe the countries of Latin America, Africa and Asia, should be discontinued because it is unsuitable now, not merely because the term is a relative one, thus making it difficult for people to understand the socio-economic conditions of the countries unless they are compared to other countries, but also because all these so-called 'under-developed countries' are in the process of developing. Their economies are not based only on export of raw materials and import of manufactured goods; the countries are also processing some of the raw materials domestically. The range of social necessities, such as education, housing, recreational and health facilities, is also widening. Hence, the term 'developing countries' should be used to apply to these countries in place of 'under-developed countries'.

Perhaps the economic position of the developing countries can be understood if it is put into the framework of Rostow's stages of economic growth. Rostow, taking the

²Loeb, G.F. Industrialization and Balanced Growth, Gronigen. J.B. Wolters Press. 1957, p. 8.

historical approach to the explanation of the process of economic development, distinguishes five stages through which all countries pass as they become fully developed.³ These stages are: the traditional society; a period during which the pre-conditions for the take-off are prepared; the take-off; the drive to maturity; and finally, the age of high mass-consumption. The position of the developing countries is the third stage, namely 'the take-off', defined by Rostow as "the interval when the old blocks and resistances to steady growth are finally overcome".⁴ At this stage, also, the "forces making for economic progress, which yielded limited bursts and enclaves of the modern activity, expand and come to dominate the society. Growth becomes its normal conditions. Compound interest becomes built, as it were, into its habits and institutional structures".⁵ Thus, developing countries are those which are in the early stages of development with a view to developing their resources and raising their living standards.

Although it is true that some obstacles to economic development, such as foreign domination, may have been overcome when these countries 'take-off', nevertheless, the basic problems characteristic of the countries, such as

³For a detailed analysis of these stages, see Rostow, R.R., The Stages of Economic Growth, Cambridge. The University Press. 1960, 179 p.

⁴Ibid., p. 7.

⁵Ibid., p. 7.

unemployment and under-employment, low income per capita, low standard of living, are still to be overcome. How to solve these problems becomes the main pre-occupation of the countries. They realize that these problems are prevalent not because human and natural resources are scarce but because the resources are poorly allocated and inefficiently utilized. What must be done, therefore, is to plan the whole economy so as to achieve increases in employment, in development of resources, and in productivity.

THE ROLE OF INDUSTRIALIZATION IN ECONOMIC DEVELOPMENT

As the developing countries make their development plans, they invariably recognize that industrialization is a very important, if not the most important, means of solving their problems. Not only does it utilize human and natural resources, thus creating employment and increasing real incomes, it also vitalizes the economy by increasing demand for agricultural products and service activities. Hence, their development plans place the greatest emphasis on the role of basic industries. For instance, in the introductory chapter to the Trinidad and Tobago 'Five Year Development Programme' can be found the following role which industrialization can play in economic development:

The party in power in Trinidad and Tobago - the first party government in the history of the country - enunciated its ideas for economic development in its Elections Manifesto for the General Elections on September 24, 1956. The preamble to its specific proposals reads as follows:

The domination of the oil, sugar and asphalt industries.

The under-development of such areas as St. Andrews, David, Togo, Nariva-Mayo, Ortoire-Morugu.

The existence of 18,000 unemployed in a labour force of 270,000, in a population of 720,000 of whom 293,000 are children under 15.

The existence of considerable under-employment, amounting to 14 out of every 1,000 persons employed.

The principal economic needs, therefore, are:

Provision of a large number of jobs.

Development of resources of the entire economy.

Expansion of existing industries and introduction of new ones.

The Development Programme, herewith presented, is a fulfilment of the specific pledges in the Manifesto.⁶

Examples of recognition of the role of industrialization in economic development can also be found in the Development Plans of such developing countries as Ghana, India, Puerto Rico, and Pakistan.

The developing countries recognize also the importance of the role of the State in industrial development. The State must prepare the environment in which industry, as a functioning entity with a life of its own, can live and grow. It must provide such supporting facilities as utilities, highways, and social services, such as schools, hospitals, and recreational facilities. In addition, the State must enter directly into industrial activities, either by assisting private entrepreneurs to carry on their concerns through tax reduction, tariff manipulation or providing

⁶Government of Trinidad and Tobago. Five Year Development Programme, 1958-1962. Trinidad. Government Printing Office. 1958, p. 1.

finance, or by becoming an entrepreneur itself, or by working alongside private industrialists. Baljet Singh points out the Indian Government's realization of the role of the State in India's industrialization:

The country.....needs a large public sector to push investment in strategical directions that have been neglected by, and are unsuitable for, private enterprise either on account of marginal considerations pertaining to net return or due to their magnitude and risks involved.⁷

This State participation, however, does not necessarily mean nationalization of private industries which have already been in operation. Except in the communist developing countries where, in accordance with their ideology, the State is the only entrepreneur, all the developing countries welcome private participation in industrial development.

For rapid development of the industrial sector of their economies, the countries set up 'industrial development corporations', or companies, as they are called in different countries. These are statutory agencies charged with the industrial development of the countries. The importance of industrialization to these countries can be seen from the wide range of powers given to these agencies. For instance, the then Gold Coast (now Ghana) Development Corporation, created in 1954 by the Industrial Development Ordinance, Chapter 191, was given the following powers:

(2) The said Corporation shall have power for the purpose of the discharge of their duty under the preceding subsection -

⁷Singh, B., Economic Planning in India, Bombay. Hind Kitabs, Ltd. 1953, p. 10.

- (a) to carry on all activities, the carrying on whereof appears to them to be requisite, advantageous or convenient for or in connection with the discharge of the said duty including the marketing of industrial products:
- (b) to promote the carrying on of such activities by other bodies or persons and for that purpose to establish or expand, or promote the establishment or expansion of, other bodies to carry on any such activities either under the control or partial control of the Corporation or independently, and to give assistance to such bodies or to other bodies or persons appearing to the Corporation to have facilities for the carrying of any such activities, including financial assistance, by the taking up of share or loan capital or by loan:
- (c) to carry on any such activities in association with other bodies or persons (including Government authorities or Local Government authorities) or as managing agents or otherwise on their behalf.⁸

In addition to these powers the Corporation was given authority "to do anything and enter into any transaction"⁹ whether or not this transaction involved expenditure, borrowing, the lending or investment of money, the acquisition of any property or rights, "which in their opinion is calculated to facilitate the proper discharge of their functions or is incidental or conducive thereto".¹⁰

This wide range of powers, including discretionary ones, is not restricted to the then Gold Coast Industrial Development Corporation alone. In the Trinidad and Tobago 'Five Year Development Programme', the envisaged Industrial

⁸The Gold Coast Government. The Industrial Development Ordinance, Ch. 191. Accra. The Government Printer. 1954, p. 338.

⁹Ibid., p. 338.

¹⁰Ibid., p. 338.

Development Corporation will be responsible for "the discovery and publicizing of some potentialities, the seeking-out and persuasion of prospective industrialists and attention to their needs with regard to information concerning such matters as labour, legislation, industrial relations, the recruitment of labour, housing accommodation for staff and many other points on which they need information and guidance will be amongst the main charges of the Corporation".¹¹

Other examples can be cited from other developing countries. The essential characteristics of these Industrial Development Corporations are: (a) that they are concerned exclusively with the promotion of industrial development; and (b) that they are not confined to one industry, or group of industries, but are empowered to operate over a wide field.

But making development plans and establishing Industrial Development Corporations are not the entire solutions to the problems of industrialization. There are still problems of the financing of the industries, problems of their proper location, and problems of getting skilled personnel to operate the industries. Without investigating all these problems, those dealing with the location of the industries are selected for a detailed investigation. In attacking the selected problems of industrial location, the following theories are found to be useful as methods of analysis.

¹¹The Government of Trinidad and Tobago. op. cit., p. 7.

THEORY OF INDUSTRIAL LOCATION

The conventional industrial location theory seeks to analyze the factors that affect location of industries. These factors are: markets; suitability of labour; cheap land; low rent or low rates; proximity to other factories in the same industry and convenience of premises.¹² These are the factors which guide an individual entrepreneur in choosing a location for his plant so as to realize the maximum profit. It is fairly clear that the average entrepreneur is in no way equipped or disposed to analyze so complex a set of unknowns before selecting a plant location, but the fact that most of these factors are considered is true since all geographic areas do not have the same industrial location advantages. The industrial location theory is, therefore, useful in making prospective industrialists conscious of these factors so as to minimize costs.

Since the beginning of this century, many economists have attempted to develop location theories, and some have concerned themselves with factors affecting both industrial and agricultural locations.¹³ The works of two industrial

¹²For a detailed discussion of these factors of industrial locations, see Political and Economic Planning. Report on Location of Industries in Great Britain. London. Political and Economic Planning. 1939, pp. 55-89.

¹³For a detailed account on the development of location theory, see Isard, W., Location and Space Economy. New York. John Wiley and Sons. 1956, pp. 24-54.

location theorists are reviewed here. In addition, an attempt at a theoretical approach to selecting industries offered by Walter Isard and his co-authors is also considered. These theories will serve as methods of analysis of the problem of industrial location in the developing countries in subsequent sections.

August Losch and Industrial Location Theory¹⁴

In his book, 'The Economics of Location' in which he discusses the location of industry, agricultural activity, towns, regions, etc., August Losch outlines his theory of industrial location.

Losch begins by attacking such early theories, as that of Alfred Weber, which have been one-sided. This one-sided orientation,¹⁵ as he points out, considers only cost factors, that is to say, cost of transportation and cost of production, disregarding the demand side, that is, market. Such a theory assumes that demand is inelastic, that is, there is no competition between industries. It assumes the barrier between neighbouring competitors as fixed. "In this case, the factory would then be situated at the point of the lowest c.i.f. costs."¹⁶

¹⁴Losch, A., Economics of Location, (translated from the 2nd revised edition by William H. Woglom with the assistance of Wolfgang F. Stopler). New Haven. Yale University Press. 1954, pp. 19-36.

¹⁵By 'orientation' is meant motives for, or the outcome of, a choice of location.

¹⁶Ibid., p. 21. c.i.f. is cost, insurance and freight.

There is another one-sided orientation which is based on 'Gross Receipts'. The aim of this orientation is to realize maximum revenue. This orientation considers only the demand or the market side alone, disregarding total costs of production. This orientation has two components: orientation by quantity, which would look more toward the number of buyers, that is, in a populous district; and orientation by price toward their purchasing, that is, in a prosperous district. Both of these orientations like a location away from competition.

Losch makes it clear that the one-sided orientation is not correct. The correct orientation is the two-sided one, which is orientation by profit. This is the complete orientation. "The right location depends neither upon expenses nor upon gross receipts alone, to say nothing of any individual cost or receipt component. The determining factor is their balance: the net profit."¹⁷ In a free economy, Losch says, the correct location of the individual enterprise lies where the net profit is greatest. The greatest profit attainable at each of these points can be determined from the cost and demand curves, while from the place of greatest money profits, the optimum location can be found. The procedure of finding this point is by empirical testing, as there is no scientific and unequivocal solution for the location of the individual firm, but only a

¹⁷Ibid., p. 26.

practical one: the test of trial and error. Hence, the earlier attempts at a systematic and valid location theory for the individual firm were doomed to failure.

Losch's criticism and theories are valid. An overall view of both the total costs and gross receipts is the most rational approach. This approach seeks the maximum net profit, which is total receipts less total costs. The other approach, that is, the one-sided orientation to either lowest costs or greatest receipts, is deceptive. An industry may produce at low cost in a particular location, but lack of market will result in a great loss. On the other hand, an adequate market may be available, but high cost of production may result in a loss to the industry. The correct approach, therefore, is the balance of the two sides - costs and receipts - which yields the greatest profit, the essence of individual enterprise.

Losch's theory is oriented purely to the individual enterprise where money profit is the only motive. The developing countries, however, need a theory which considers more than the profit motive. The social welfare motive, that is, consideration of the people's needs, must also be incorporated in a theory of industrial location.

Edgar Malone Hoover and Industrial Location Theory¹⁸

Hoover sets down the essential problems of industrial location in his book, 'The Location of Economic Activity'.

¹⁸Hoover, E.M., The Location of Economic Activity, New York. McGraw-Hill Book Co. Inc. 1948, 310 pp.

His discussions are very much oriented to cost factors of location. He divides cost factors into two groups: transportation factors and the production factors. Cost of procuring the raw materials and cost of distributing the finished products are considered as transportation costs while the 'agglomerative' costs and 'institutional' cost factors, such as taxes, labour, etc., are considered as partial determinants of production costs. Hoover's main contribution to industrial location theory lies not in theoretical originality, but in penetrating analysis of the influence of these factors on industrial location.

Freight

Hoover stresses the fact that cost of transfer does not increase proportionately with distance; rather the additions to transfer costs are less than proportional as the distance increases - for long distances, transportation costs are less per unit article, making water transportation cheap, relative to rail or trucking costs.¹⁹

From still another viewpoint, freight costs are significant determinants of location. Any perishable, dangerous, fragile or offensive cargo requires special handling. The extra costs of such handling force the entrepreneur to emphasize this factor in selecting an industrial location.²⁰

¹⁹Ibid., pp. 19-22.

²⁰Ibid., p. 25.

The same reasoning appears in Hoover's brief discussion of freight absorption. In his view, the firm that absorbs freight costs is the principal "gainer by proximity and the principal loser by distance".²¹ It follows that the incentive to locate near materials or markets is reduced for one purchasing from, or selling to, the freight absorber, though, from the standpoint of flexibility of service, convenience of contact, and accumulation of inventory, distance still remains a factor. None of these freight considerations change the basic theory, but they do emphasize some aspects of transportation practice which explains the transport orientation of certain industries.

Agglomerating and Deglomerating Forces

Hoover's analysis of the agglomerating and deglomerating forces in industrial location is also penetrating. Included in agglomerating are such advantages as better transfer services, a broader and more flexible labour market, more advanced banking facilities, better police and fire protection, and lower insurance costs and utility rates. In addition, by agglomerating and localizing, firms specialize to a greater degree. Thus certain operations and services that a plant in a less industrialized area would have to perform for itself could now be farmed out

²¹Ibid., p. 28.

economically. The inter-industry advantage of agglomerating is pronounced. Thus, industries may be linked by the use of each other's by-products, complementary use of labour, or a policy of 'hand-to-mouth' purchasing of inventory, rather than inventory accumulations.²²

Institutional Factors

Hoover's analysis of the institutional factors shows that Hoover, unlike many industrial location theorists, is interested in all possible locating forces, not only the general factors that affect all plant locations. This interest makes him analyze the locational influence of property taxes.

Hoover regards the property tax burden as an element of land cost. This factor, he claims, affects the location in much the same manner as the interest burden. He concludes as follows:

A tax that becomes a fixed cost regardless of rate of output, e.g., a general property tax, has about the same effect as a higher interest rate: it penalizes localities where plant and equipment are less fully utilized and sharpens the producer's incentive to find a location where less capital investment is required per unit of output.²³

A tax reflects the return on the investment, thereby influencing the locational choice.

²²Ibid., pp. 116-123.

²³Ibid., p. 254.

Climate

Hoover describes the significance of climate in plant location in a similar manner.²⁴ Where the climate is excessively hot, labour may be sluggish and labour cost high; if air refrigeration units are used to counteract this tendency, the land cost rises. Where the climate is very cold, the heating system becomes very costly, resulting in high land cost.

In addition to these principles relating to the selection of location for private and public industrial activities, Hoover develops ideas on land utilization; metropolitan and regional planning, and programmes of industrial development and stabilization at local, state, regional and national levels; and the locational significance of political boundaries.

These ideas, as set down in his book, are of great significance for the developing countries. For instance, his ideas on the problems of economic development show the conditions which must be present for satisfactory economic development at the regional level.²⁵ Such conditions as the availability of a domestic market, the intensity of land use for increased production to release agricultural labour for industry, and the development of manufacturing industry,

²⁴Ibid., p. 76.

²⁵Ibid., pp. 187-196.

which, as a basic activity, will result in a greater demand for the products of the other sectors of the economy, for instance, agriculture and commerce. He also points out such impediments to industrialization as lack of raw materials, capital, and energy, and also high social overhead costs, such as cost of providing roads, schools, housing and other social facilities which, though not generally considered as locational factors, indirectly affect industrial development.

Hoover's ideas are useful in understanding the steps which should be taken by the developing countries in their goal towards industrialization. However, Hoover is silent on how industries should be planned within a regional framework.

Walter Isard and Others on Industrial-Complex Analysis

A theoretical approach to planned industrial selection for a region is taken by Isard, Schooler and Vietorisz.²⁶ In their book 'Industrial-Complex Analysis and Regional Development' they seek to identify some specific combinations of industrial activities for which Puerto Rico is likely to be an economically favourable location. After examining such possible approaches of analysis, as the broad economic development approach, the comparative-cost analysis for individual industries approach, the location quotient approach, the coefficient of localization approach, the

²⁶Isard, W., Schooler, E.W., and Vietorisz, T. Industrial Complex Analysis and Regional Development. New York. John Wiley and Sons. 1959, pp. 1-26.

inter-regional output-input approach, the linear programming approach, and the gravity model approach, and rejecting them all as inappropriate for their purpose, the authors finally developed their own approach, 'the industrial-complex analysis'.²⁷ This approach is based on considerations of sets of sectors and was selected because it could yield positive results, whereas an approach such as the comparative-cost analysis which considers industries individually could produce a negative result for Puerto Rico, since the specific industry, considered alone, could operate at a disadvantage compared with the operation of the same industry on the mainland (United States). On the other hand, if industries are considered in a complex, because of economies of scale and integration, urbanization economies, production relation, and other agglomerating factors, it would be economically advantageous for these industries to operate together.

In developing their analysis, the co-authors determined the available resources, both human and non-human, in Puerto Rico. Puerto Rico was seen to have three main locational advantages which any rational method of industrial selection should take into account. These advantages are: a large supply of moderately skilled, cheap labour; proximity to oil deposits in Venezuela; and easy access to the United States markets. This last factor,

²⁷For detailed discussion of the various approaches, see Ibid., pp. 5-25.

as was shown, affords Puerto Rico a major advantage relative to other cheap labour regions of the world, including some within the United States.²⁸

Given these three advantages, the problem that arose was how they could be combined by means of a matrix of industrial activities to yield the maximum advantage for location in Puerto Rico. In other words, this was a problem of identifying the industrial complex which could be advantageously located in the country.

The procedure followed was the identification of a group of industries that use the same raw materials. The selected industry was that which utilizes the unskilled and semi-skilled labour available in Puerto Rico. In this case it was necessary to include fibre production in such a complex because of its intense utilization of the abundance of moderately skilled and cheap labour. Oil refining was considered together with synthetic fibre because the former uses the second Puerto Rican resource, namely, oil deposits in Venezuela. There would be a gain here since the raw materials for synthetic fibre could be obtained from petroleum refinery by-products. This combination would result in additional gains on two scores: first, refinery products would be upgraded, and secondly, transport costs on chemical intermediates would be eliminated. Finally, both the refinery products and the synthetic fibre products

²⁸Ibid., pp. 27-28.

could be exported to the United States market duty free, thus making use of Puerto Rico's third important advantage, that is, direct access to the mainland markets.

Fertilizer production was also included in the complex because its transport cost is a locationally important variable, and also because nitrogen fertilizers can be based on refinery by-products, thus upgrading refinery by-products. In addition there is a great domestic market for fertilizers.

The authors concluded that, "in considering the possibilities for economic development in Puerto Rico, industrial complexes involving petroleum refinery, petrochemical, synthetic fibre and fertilizer processes appear to be promising".²⁹

Such an approach as taken by Isard and his co-writers is a rational one. As has been pointed out above, if only one type of activity, for instance, petroleum refinery, were to be considered, it would probably be uneconomical to locate it in Puerto Rico. Such a rational approach to locating industries is needed for the selection of industries for developing countries. However, their approach is limited in the sense that it is restricted only to selecting the industries. A wider approach is needed which is oriented to considering all aspects of industrial location in a regional framework.

²⁹Ibid., pp. 29, 32.

Summary

The theories discussed above should be given considerable thought when the developing countries make policies on industrialization. August Losch writes of a 'two-sided' orientation, that is, balancing gross receipts against costs, as an indicator of the profitability of a location. E. M. Hoover takes the same point of view except that he discusses the receipts and costs in greater detail. These theorists look at the problems of industrial location from the viewpoint of private entrepreneurs whose main aim is profit. Nevertheless, the developing countries can learn much from these theories for no country, however its goals, can afford to produce at a loss indefinitely. The rational approach to selecting types of industries, offered by Walter Isard and his co-authors can also help the developing countries if the industries are selected with special reference to their national goals.

CONCLUSION

The developing countries have 'taken-off' in economic development in order to achieve such social and economic goals as full employment, a strong balance of payments, higher per capita income, and higher standards of social facilities and amenities. In the course of their economic development, they look upon industrialization as an important means of achieving some of their socio-economic

goals because most of these goals have been achieved by the more developed countries through industrialization. The degree to which the developing countries attach importance to industrialization is shown in their various development plans.

However, in the process of industrialization, the developing countries encounter many problems; among them is the problem of industrial location. What approach must be used in locating the industries in order to achieve their industrialization goals? Should the industries be concentrated in a few cities or spread throughout the country? In what framework should industrial location be predetermined? Such are the questions which the countries have to answer when they embark upon industrial development. It is the contention of the author that:

ONLY PREDETERMINED INDUSTRIAL LOCATION WITHIN
A REGIONAL FRAMEWORK WILL HELP THE DEVELOPING
COUNTRIES TO ACHIEVE THEIR INDUSTRIALIZATION
GOALS.

The use of this regional approach to industrial location in the developing countries will assist those responsible for their national industrial development policies to examine closely the resources of both the urban and the rural areas, to utilize these resources to create employment and income for the people. Such a regional approach will necessitate an appreciation of the idea of predetermined industrial location within a regional framework.

CHAPTER II

THE CONCEPT OF PREDETERMINED INDUSTRIAL LOCATION WITHIN A REGIONAL FRAMEWORK

Little has been written concerning the concept of predetermined industrial location within a regional framework and how the concept has been applied in either the developed or the developing countries. For this reason, it is impossible to analyze examples from many countries to illustrate this concept and how it has been applied. In view of this scarcity of information, it is the purpose of this chapter to examine briefly the basis of the concept of predetermined industrial location within a regional framework and how this concept has been applied in one developing country, namely Puerto Rico, so as to throw light on the concept.

THE BASIS OF THE CONCEPT OF PREDETERMINED INDUSTRIAL LOCATION WITHIN A REGIONAL FRAMEWORK

The concept of predetermined industrial location within a regional framework is based upon the premise that a country is varied in its topography, soils, and socio-economic pattern so that its division into sub-areas is necessary for industrial planning purposes. Such a division permits a detailed examination of the needs and the potentialities of all the various regions in a country as participants in industrial development. A regional analysis for the purposes of national industrial development is

valuable not only for its presentation of the geographical framework within which the existing economy operates but also for planning of the facilities that support industrial location, such as transportation, utilities, water supply, electric power, housing and other community facilities.

In any country, because of variations in its physical and social characteristics, it is important to understand these characteristics and how they affect the economic structure. Predetermined industrial location within a regional framework permits regional studies of population distribution, natural resources, transportation and other facilities which are basic to industrial development.

APPLICATION OF THE CONCEPT IN PUERTO RICO

In the Puerto Rican industrial 'Master Plan',¹ prepared by the Puerto Rico Industrial Development Company, can be found a rational predetermination of industrial location within a regional framework. For the purposes of the plan, eleven Integrated Industrial Areas and twenty-eight Local Industrial Centres were established. These areas and centres were developed "not only to give a regional basis to planning but also to show how the remainder of the Island outside of San Juan and other major cities will

¹Puerto Rico Industrial Development Company. Master Plan, San Juan. 1956, 143 p.

benefit by industrialization".²

Delimitation of Industrial Areas and Centres

The primary objectives of the industrial development programme were to reduce unemployment and under-employment, increase workers' incomes, and raise the level of living of families in Puerto Rico. Much industrialization has taken place in the San Juan Metropolitan Area, and the rest of the country has not benefited by the earlier industrial development programmes. This is the result of the relative advantages, such as large labour force and market, which the San Juan Metropolitan Area possesses for the location of industries. In order that the achievement of the above objectives might be advanced in the other areas of Puerto Rico, it was proposed by the Development Company that industrial centres be developed which would have attractions for industry similar to those of the Metropolitan Area. The industrialization potential not only of the centres themselves but also of the surrounding towns would be increased by the provision of easily accessible services and facilities.

The following municipalities were selected as industrial centres:

- | | | |
|-------------------|---------------------|------------|
| 1. San Juan | 5. Manati-Vega Baja | 9. Fajardo |
| 2. Ponce | 6. Aguadi | 10. Yauco |
| 3. Caguas-Humacgo | 7. Guayama | 11. Cayey |
| 4. Mayaguez | 8. Arecibo | |

²Ibid., p. 13.

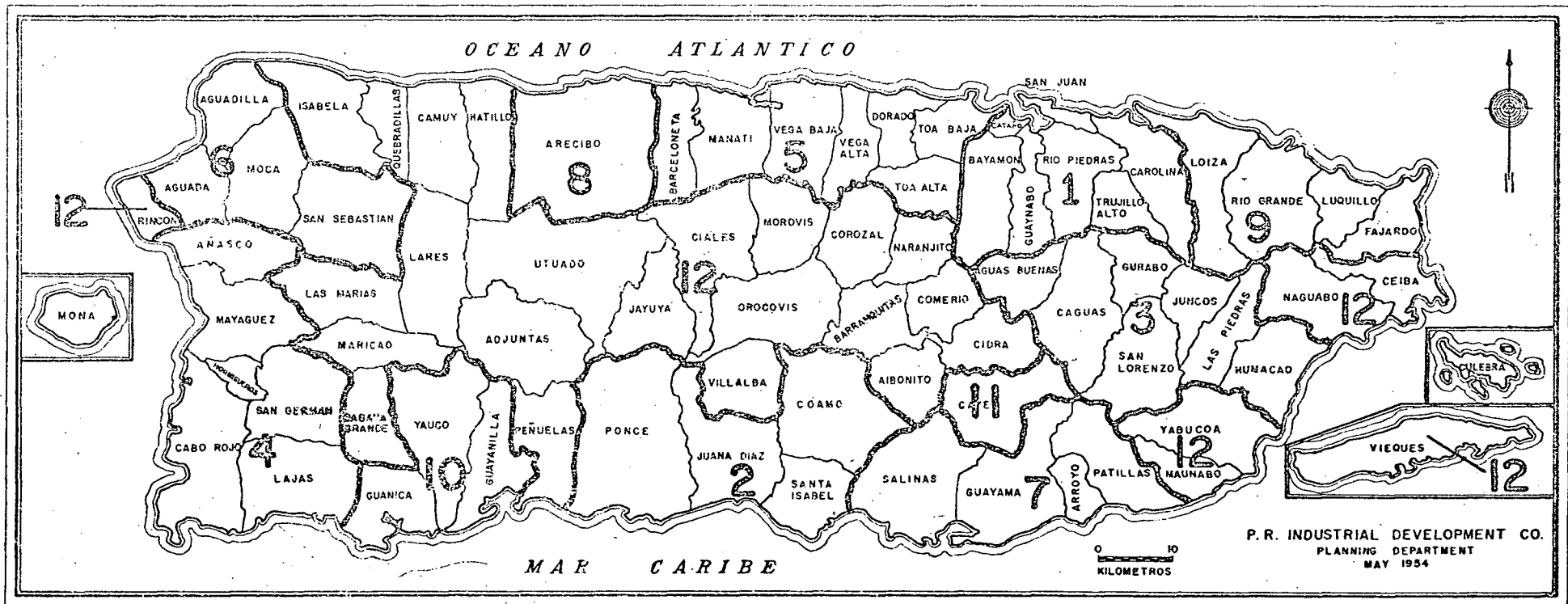
These centres can be seen in Figure I on the following page. They were selected because they exhibited a combination of the following characteristics:

- a. Large centre of population
- b. Existing industrial development
- c. Trade centre for surrounding towns
- d. Existing industrial and residential services and facilities.
- e. Accessibility to surrounding towns as centre for new services and facilities.

These characteristics are quite important in any regional industrial development. A large centre of population is needed for the labour-oriented industries; such a centre, like a trade centre for surrounding towns, can also serve as a market for the industrial products. Existing industrial development is also important for the efficient operation of new industries which require integration with other industries. Existing industrial and residential services and facilities would help to cut down the cost of providing these facilities and services. Finally, accessibility to surrounding towns is important in enabling the surrounding towns to benefit by the industrial development in the centre.

After the industrial centres were selected, a study was made to identify the towns with which the centres had primary economic relationships. These economic ties were thought of in terms of wholesale and retail trade, farm produce markets, professional and business services, etc. It was understood that for certain kinds of economic or social activity, every town eventually depended upon San Juan because it is the economic, cultural, and governmental

Figure I. MAJOR INDUSTRIAL DEVELOPMENT AREAS



INTEGRATED INDUSTRIAL AREAS

- | | |
|--------------------------|------------------------------|
| 1. SAN JUAN AREA | 7. GUAYAMA AREA |
| 2. PONCE AREA | 8. ARECIBO AREA |
| 3. CAGUAS-HUMACAO AREA | 9. FAJARDO AREA |
| 4. MAYAGUEZ AREA | 10. YAUCO AREA |
| 5. MANATI-VEGA BAJA AREA | 11. CAYEY AREA |
| 6. AGUADILLA AREA | 12. LOCAL INDUSTRIAL CENTERS |

centre of Puerto Rico. However, the groups of towns shown in Figure I were those among which there were more frequent day-to-day contacts. The evidence of this pattern of economic relationships was sought in the study of the following key regional factors:

Topography

The degree to which towns are related to one another is often dictated by their regional topographic relationship. For towns on Puerto Rico's northern and southern coastal plains, topography was found to be less important than distance, but the relationship of towns in the highlands to the selected industrial centres was found to be determined by topography and the ease of access between them.

The Cordillera Central and the great valleys which lead down from it to the seas surrounding the Island are the main features of the topography of the country. The central mountain spine makes a sharp physical demarcation between north and south, and the easiest communication routes are down the valleys from the highland towns to the coastal cities. The lateral ridges extending from the central mountains to the east and west coasts serve as barriers to separate groups of coastal towns from one another. The location of larger urban centres and the lines of communication from them to the smaller villages were largely determined by this configuration.

Highway Connections

Highway connections are the basic factor which determines economic and social intercourse among towns, for the extent of these activities is measured by the amount of movement between them. In the mountainous areas, as has been pointed out above, road connections are almost completely dictated by topography. In easier terrain, highway location tends to be a continuous process. The improved access generates a still greater volume of movement which in turn creates a demand for further improvement in the highway facilities. The result of this process is that the centres become increasingly important and their growth is more rapid relative to the surrounding towns. The grouping of towns around regional centres, therefore, was found to reflect the existing pattern of highway connections.

Average Daily Traffic Flows

Average daily traffic flows were taken as another evidence of the economic relationship between towns. The volume of flow of passenger and commercial traffic between towns is proportional to their importance as centres of economic activity and to the strength of the economic ties between them. In this regard, the Development Company received assistance from the Department of Public Works which maintains a continuous system of traffic surveys along the major highways of Puerto Rico. Their traffic flow maps represented the relative volumes of vehicle movement

between towns by varying band widths. These maps were considered in the process of delineating the industrial regions.

Passenger Transport Services

The pattern of transportation services reflects all of the above factors. "Topography influences the layout of the highway system and the physical connections between towns, and economic relationships between them are reflected in the demand for transportation services and the number of carriers which become available in response to this demand."³

A field survey was undertaken to determine the pattern of passenger transportation services between towns. The purpose of this survey was to document general knowledge as to the cities which are tributary to them and the pattern of industrial development regions reflects the findings of the survey.

Commercial Banking Services

Further evidence of economic ties between communities was sought in the geographic distribution of banks and the areas served by each. A survey of commercial banking services was made and the distribution of these banks was a factor considered in the delineation of the Integrated Industrial Areas.

³Ibid., p. 16.

Potentiality as Centre of Industrial and Residential Services

The delineation of the industrial regions was intended not only to accommodate the existing pattern of relationships among towns but also to serve as a planning tool by which industrial development might be fostered. The division of the Island into industrial regions would permit more detailed studies of the resources and needs of each area and help to reveal its characteristics and potentialities. In terms of positive action to foster industrial development in the towns outside of the San Juan Metropolitan Area, it was recommended that additional and residential services should be provided in the centres. This would increase the potentiality for industrial location of all the surrounding towns within easy access. An important consideration in grouping the towns was, therefore, the service potentiality of each central town and the surrounding area which it would be able to serve.

The Resulting Pattern

The result of the various studies and considerations discussed above was the delineation of eleven Integrated Industrial Areas and twenty-eight Local Industrial Centres to serve as the basis for planning the future industrialization. These are shown in Figure I.

The Integrated Industrial Areas were delineated so as to include adjoining municipalities which, because of

topography, transportation routes, population concentration, and existing economic development were seen as providing a homogeneous area within which concentrated industrial development would take place in the future. These areas would develop so as to permit, within each area, a ready exchange of manufacturing labour, goods, and services between the municipalities included therein. These areas would be the major centres of industry in Puerto Rico.

The twenty-eight Local Industrial Centres comprised those municipalities which were not included in the Integrated Industrial Areas. These centres, because of their isolation, rugged terrain, poor transportation routes, and scattered population, would not support a very extensive industrial development. Most of the Local Industrial Centres are in the mountainous interior section of the Island, with a few along the coast. These coastal Local Centres might later be added to adjacent Integrated Areas or might develop into separate Areas.

Taken together, the Integrated Industrial Areas and the Local Industrial Centres formed a regional pattern for the entire Island by which the future industrialization would be guided in such a way as to satisfy area needs by area resources. The aim was to achieve the goals of the development programme with the least wastage of the limited resources available.

For each industrial region, the types of industrial activity that would be economically advantageous were

selected; industrial locations were also selected; and such supporting facilities necessary for industrial operation as utilities and highways, housing, schools, and hospitals, were also considered. In addition, the need for co-operation between both the public agencies and the private entrepreneurs was also emphasized.

Such a rational approach to the predetermination of industrial location within a regional framework is helpful in the general planning and development of Puerto Rico, since the approach permits the country to examine in detail the potentialities of the various areas.

Summary

In order to enable all the various areas of Puerto Rico to benefit by industrial development, the Puerto Rican industrial 'Master Plan' subdivided the country into industrial regions. In this regard, eleven Integrated Industrial Areas and twenty-eight Local Centres were delimited, based on the following criteria: population; existing industrial development; trade centre for surrounding towns; existing industrial and residential services and facilities; and accessibility to surrounding towns as centres for new services and facilities. After the industrial centres were selected, towns with which these centres had primary economic relationships were identified. The evidence of this pattern of such regional factors as topography, highway connections, average daily traffic flows, passenger transportation

services, and commercial banking services. As a result of the study of these regional factors, eleven Integrated Industrial Areas and twenty-eight Local Centres were delimited as regions within which industrial location for specific industries would be predetermined.

CONCLUSION

The concept of predetermined industrial location within a regional framework has not yet been either comprehensively investigated or applied in either the developed or the developing countries. However, Puerto Rico's experience provides a method of approach to the investigation of the concept and its application in the developing countries so that these countries may achieve their industrialization goals.

There is no available information concerning the extent to which the application of the concept has been successful in Puerto Rico, but it can be said that such a regional approach to industrial location is helpful to Puerto Rico since the approach enables the country to examine closely the needs and resources of each region; the developing countries can learn a lesson from Puerto Rico's experience.

Puerto Rico was subdivided into Integrated Industrial Areas and Local Centres, owing to the country's peculiar topography and distribution of resources. Such criteria, namely, the topography and the distribution of resources may not necessarily be the same in all the developing countries,

and for that reason, not all the developing countries would find it necessary to be subdivided into integrated areas and industrial centres. However, the general approach, that is to say, the subdivision of all the developing countries into industrial regions would help these countries to achieve their industrialization goals. Prior to demonstrating how predetermined industrial location within a regional framework will help the developing countries to achieve their industrialization goals, it is necessary to consider the problems entailed in industrial location.

CHAPTER III

PROBLEMS OF INDUSTRIAL LOCATION

A private industrialist may conceive of the problems of industrial location as mainly problems of locational selection. His goal, namely profit maximization, is clearly known to him, and he does not need to identify it. He may have in mind the type of industry he wants to operate to realize his goal. A government, on the other hand, trying to influence the location of industries or develop them itself, cannot regard problems of locational selection as the only problems of industrial location. Every government is presumed to function for the benefit of the society as a whole. For this reason, the moment a government enters into industrial development, it is presumed that it has a view to achieving complex social and economic goals. These goals must be identified so as to enable the government to know the types of industries to be developed and where to locate them. In this sense, the problems of industrial location include the identification of the national industrialization goals; problems of selection of industries and of locations; and problems of providing supporting facilities to keep industries healthy on the sites chosen.

NATIONAL INDUSTRIALIZATION GOALS

National industrialization goals are only some of the national goals in economic development. The industrial-

ization goals must be identified for a developing country to know what types of industries to select and where to locate them. Whilst it would be impossible to list all the developing countries and their respective industrialization goals, it can be said in general terms that the main goals for which most developing countries embark on industrialization are: increase in income per capita; earning or saving foreign exchange; and full employment.

Increase in Income Per Capita

Income per capita in the developing countries is low relative to that of the more developed countries.¹ This is an obvious fact, for productivity is relatively low in the developing countries. The low productivity can be attributed to lack of skill, too many people crowded on land, lack of capital and lack of administration, and use of primitive farm implements. Agriculture can be developed, and it is being done in many developing countries, to raise incomes, but the relatively high incomes in the industrialized countries, such as the United States and the United Kingdom, have shown that incomes are higher in industry than in agriculture.² Hence, in making plans for industrial

¹Compare, for instance, the per capita incomes of economically active population of: India, \$60 U.S.; Pakistan, \$70 U.S.; with United Kingdom, \$780 U.S.; United States, \$1870 U.S. (1952-54 figures). Source: Loeb, G.F., op. cit., p. 14.

²Ibid., pp. 14-18.

development, the developing countries have the objective of raising the incomes of the people. This goal has been clearly stated by the framers of the Puerto Rican Industrial Development Plan: "The goal that has been set is a minimum family income of \$2,000 a year including the cost of government services."³

Industrial projects which are economically sound in the first place and properly administered can contribute immensely to the incomes of the people. The potential for such projects exists in almost all developing countries. The problem is to find the industries and help them to operate. But for every sound project which has the inherent potential to make a significant contribution to the per capita income, there may be some projects which have little or no real capacity for making a positive economic contribution. One of the most important aspects of industrial development planning is identifying and stopping such projects before the economy is harmed.

Earning or Saving Foreign Exchange

Another basic goal most developing countries have in their industrial development programmes is earning or saving foreign exchange through diversification. Most developing countries rely on the export of one or few products for much of their livelihood. These goods are sold in highly competitive international markets where prices are unstable

³Puerto Rico Industrial Development Company. op. cit., p. 1.

because of severe fluctuations of both supply and demand.⁴ Consequently, the unit prices for the exports vary widely from year to year. The physical volume of the products available for export also fluctuates considerably if the item is agricultural, because crops vary from one year to another. With the combination of crop fluctuation and price variations, the foreign exchange earnings of a country overly dependent on such exports, and consequently its national income, are subject to extreme instability. A United Nations analyst has shown that from 1901 to 1950, the average year-to-year variations in foreign exchange yield of eighteen major crops exported by some developing countries was 23 per cent.⁵ In addition to added stability, industrialization which enables the country to manufacture products to be sold competitively in export markets usually brings about larger foreign exchange earnings which result in increased national income.

In many development plans the earning of foreign exchange through diversification is stressed as a basic goal in industrialization. The Philippines, in view of their great reliance on a small number of exports, envisage the development of basic industries to change the "structure of

⁴For instance, about 80 per cent of the Philippines' exports consist of 4 commodities: sugar, copra, abaca and timber (The Government of the Philippines, The Five Year Economic and Social Development Programme, Fiscal Year 1957-1961. 1957, p. 18).

⁵Department of Economic Affairs, Instability in Export Markets of Underdeveloped Countries. New York. United Nations. 1952, p. 36.

the economy so that there will be more dependence on internal diversified production and less dependence on a few basic exports".⁶

Industrialization, which permits the economic production of goods for domestic use which would otherwise be imported, has an equally good stabilizing effect. Such total manufacturing reduces demands on the country's foreign exchange resources. In time of low earnings from exports, the consumption of the items continues instead of having to be curtailed. Moreover, domestic production of manufactured goods, like any creation of additional wealth, is in itself an addition to the national income.

Full Employment

Full employment of the unemployed or partially employed can be another sound goal which industrialization, under certain conditions, is regarded by the developing countries as desirable. These conditions are that the unemployed people could not be used more productively in agriculture or some other activity, and that the particular industrial projects in which they could be employed are sound enough to make a net contribution to the national income. Full employment is not restricted to human resources alone; natural resources can also be unemployed or under-employed, and industry is meant to create markets for local

⁶Government of the Philippines. op. cit., p. 8.

raw materials, such as timber or agricultural or mineral products, which otherwise would be largely or completely wasted.

Full employment of both human and natural resources is a goal emphasized in many Development Plans. The Pakistan Five-Year Plan states this goal in this way:

The objective of providing for a maximum increase in employment has been particularly important in framing the programme for small industries. The increase in direct employment in large-scale industry is expected to be about 200,000; the increases in small-scale industry and through indirect effects are very difficult to estimate but they would be larger.⁷

In the same way the Puerto Rican Industrial Plan aims at "the reduction of unemployment to its reasonable minimum of about 4 per cent of the Labour Force".⁸

Achieving such a goal is difficult but not impossible. Efficient utilization of natural and human resources involves costs of importing machinery to process the materials and also cost of training the people. These costs must be borne by a developing country if it is clear that there will be a net gain to the economy, for unused or less efficiently used resources are a waste to the country. In order to achieve such a goal, a survey of the quantity, quality, and the degree of utilization of the resources will be needed.

⁷Government of Pakistan Planning Board. The First Five-Year Plan, 1955-1960. Karachi. 1956, p. 7.

⁸Puerto Rico Industrial Development Company. op. cit. p. 1.

Summary

Increase in income per capita, earning or saving foreign exchange, and full employment of the employed or partially employed are not the only goals which the developing countries strive to achieve by means of industrialization, though these are very significant ones. Nor can it be said that every developing country has only one goal.

Several goals may be combined in a single industrialization policy, but the emphasis on some goals may be greater than the emphasis on others, the degree of emphasis depending on the existing socio-economic conditions in the country. The goals which a developing country has for industrialization must determine the types of industries to be selected for development.

SELECTION OF INDUSTRIES⁹

Industrialization is not an end in itself but a

⁹So far there has been no attempt to define 'industry'. The term 'industry' is somewhat ambiguous. In Canadian terminology, particularly in statistical use, the term 'industry' refers to all economic activities (c.f. e.g. Dominion Bureau of Statistics, Department of Trade and Commerce. Census of Canada, 1951, Vol. IV: Occupation and Industries, Ottawa, 1953). A less comprehensive definition commonly employed in other countries includes under industry only such productive activities as are related to the transformation of materials. In general, industry also includes mining, public utilities and construction, although these are sometimes excluded (c.f. e.g. United Nations. World Economic Situation: Industrialization in Egypt, Israel and Turkey, Pt. 1: Growth and Structure of Manufacturing Industry, New York. United Nations. 1951, p. 1). For the purpose of the thesis the term 'industry' is used to mean only such productive activities as are related to the transformation of materials, and it thus excludes mining, public utilities and construction. In short, 'industry' refers to manufacturing alone.

means to achieve special goals, which may be: increase in the national income; stability of foreign exchange; and maximum utilization of resources. In short, industrialization is meant to raise the living standards of people.

Therefore, governments and all others involved in the campaign to solve problems of the developing countries through industrial growth need to consider the general industrialization goals and problems and every specific project in terms of value to the economy. In practice, how to identify the types of industry which, from the viewpoint of the whole economy, will be most beneficial, poses great problems.

As an approach to the selection of industries in the developing countries, several criteria have been suggested by various research organizations and individual economists. These criteria purport to be guide-lines calculated to assist the developing countries to select industrial activities, which will bring the maximum benefit to their economies. Some of these criteria are: factor intensity; plant size and complexity; foreign exchange benefits; and utilization of raw materials.

Factor Intensity

The factor intensity criteria has two opposite sides: the labour intensity criterion and the capital intensity criterion. Unemployment, under-employment, and shortage of capital are characteristic of most developing economies. For this reason it has been suggested that the

developing countries must select industries which make maximum use of the abundant factor, labour, and minimum use of the scarce factor, capital. This viewpoint has been expressed by a United Nations report in this way:

Other things being equal, therefore, in most underdeveloped countries, it is labour intensive rather than capital intensive industries that would appear likely to possess the great relative competitive advantage even when the productivity of labour is somewhat lower than in the more advanced countries.¹⁰

Buchanan and Ellis have expressed the same viewpoint in this way:

Since the most pervasive economic feature of the underdeveloped countries is the abundance of labour in contrast to the shortage of capital, strong presumption exists that capital should be used sparingly relative to labour whenever there is a choice in the methods of production.¹¹

The labour intensity criterion is useful in identifying such industries as will demand less capital, whilst at the same time utilizing the unemployed and the under-employed rural and urban labour. This criterion has been recommended in the Puerto Rico Industrial Development Plan. The planners point out that unemployment is a problem in the country, and, for that reason, the establishment of "Labour-oriented industries, such as home needlework, apparel manufacture.....",¹² must be an important objective of

¹⁰United Nations. Processes and Problems of Industrialization in Underdeveloped Countries. New York. United Nations. 1955, p. 69.

¹¹Buchanan, N.S. and Ellis, H.S., Approaches to Economic Development. New York. The Twentieth Century Fund, Inc. 1955, p. 64.

¹²Puerto Rico Industrial Development Company. op. cit., p. 26.

industrial development. As time goes on, however, mechanization and automation may be introduced. The answers to the questionnaire, drawn by the United Nations Economic Commission for Asia and the Far East (ECAFE) show that "the absorption of surplus labour is also an important consideration in the selection of industries in many countries of the region, as shown by the emphasis on 'cottage' industry, particularly cotton handloom weaving in India".¹³

The labour-intensity criterion has much to commend itself, but it must be used quite selectively. An industry should not be selected just because it creates employment; it is important to relate the advantages arising because an industry is labour-intensive to the advantages and disadvantages of the other things which are part of the same package. Too often those who advocate a project on the grounds of its importance in creating employment neglect the project's other economic features, which may cause its total impact to be much less favourable, or even harmful to the economy.

An opposite, though less often suggested, criterion is stressed by some economists. This is the capital intensity criterion. The advocates of this criterion assert that capital intensive projects may have such great advantages in productivity and efficiency that the loss through stressing the use of scarce capital rather than abundant labour is more

¹³United Nations Economic Development and Planning in Asia and the Far East - Industrialization. New York. United Nations. 1958, p. 50.

than offset. Galenson and Leibenstein express the capital intensity case in this way:

The correct criterion for allocating investment must be to choose for each unit of investment that alternative that will give each worker greater productive power than any other alternative. To achieve this result we must maximize the amount of capital per worker.....our thesis, badly, is that successful economic development under present conditions, particularly in the face of gross backwardness, hinges largely upon as large a scale as possible.¹⁴

Whilst capital-intensive industries do not solve the problems of unemployment and under-employment, their importance in contributing to the national income and accelerating the growth of other industries should not be overlooked. The importance of capital-intensive industries has been emphasized by the Indian Plan in this way:

.....rapid industrialization and diversification of the economy is the core of development. But, if industrialization is to be rapid enough, the country must aim at developing basic industries which make machines to make the machines needed for further development.¹⁵

Evidence of employment benefits in projects which are labour intensive is worthy of attention, as is evidence of technological efficiency in projects which are capital-intensive. In itself, neither should be considered an economic justification for a project; every project must be weighed to determine its net advantage to the economy.

¹⁴Galenson, W. and Leibenstein, H. "Investment Criteria, Productivity and Economic Development". Quarterly Journal of Economics. Vol. 69. 1955, p. 351.

¹⁵The Government of India. op. cit., p. 392.

Plant Size and Complexity

Another criterion suggested as the prime test of suitability of industrial projects is that of the size and degree of complexity involved. This might be termed the 'stepping-stone theory', for it stresses that an industrially developing country must progress from small, simple industrial operations to larger and more complicated operations as skills, capital and experience are acquired. Brozen puts this view in this way:

In general, in early stages of development, the enterprises which are of a type calculated to develop entrepreneurship should be encouraged. Those which are small, use rudimentary production techniques, and give immediate returns are more likely to accomplish this at the earlier stage. Large scale enterprises using more complicated techniques and yielding distant returns must wait for a later stage when simple entrepreneurial skills and attitudes have been learned..... The evolution may be thought of as from the simple to the complex. Simplicity may be measured in terms of finance, production, and return.¹⁶

In its report to the United States Congress on overseas economic operations, the Hoover Commission strongly supported the small-scale industry approach:

The most valuable contribution to world economic stability can be made by improvement of small manufacturing industries in non-industrialized countries..... In the 'Asian-African Arc', with the possible exception of Japan, no manufacturing or large-scale industrial development projects should be undertaken, and industrial aid should be confined to small industries..... Industrial

¹⁶Brozen, Y., in Economic Development. Principles and Patterns. Brozen, Y., Williamson, H.F., and Buttrick, F., (Eds.). Englewood Cliff (N.J.) Prentice-Hall Inc. 1954, p. 18.

projects should not be undertaken in countries which do not already have an industrial background. In these countries there is little local capital available for participation, and the vast background of transport, marketing, technical and executive skill is lacking. Large industrial projects cannot succeed against this background and in any event cannot affect the standard of living for many years to come.¹⁷

In its recommendation to the Ceylonese Government on the types of industries to be selected, the International Bank for Reconstruction and Development stated clearly that until training facilities were greatly improved, new industries should be either those not calling for unusual amounts of skilled labour, or ones employing techniques which could be learned easily and rapidly.¹⁸

In fact, the advantages of small, simple projects are as numerous as they are obvious. Small projects are less demanding of the things a developing country usually lacks: capital, management, and technical skills. Generally they use more labour in relation to capital than large projects. They can usually be built quickly and put into operation to produce returns. They facilitate decentralization, which enables people in various areas to have contact

¹⁷Overseas Economic Operations. Report to the Congress. U.S. Commission on Organization of the Executive Branch of the Government. Washington, D.C. 1955, p. 107.

¹⁸International Bank for Reconstruction and Development. The Economic Development of Ceylon. Baltimore. The Hopkins Press. 1953, pp. 598-599.

with industry. They often can raise capital more easily, in the absence of capital market, through direct contact between the project sponsor and other local investors. They can provide a reduction of financial risk through diversification, thus lessening the magnitude of overall loss through the failure of any one project.

All these advantages show that industrial development can be facilitated by establishing small, simple industries. However, the development of these types of industries should not be thought of as an alternative to the establishment of medium-sized and large industries, where it is clear that they can be operated economically. A country does not need to choose between small industries and other industries, for generally the two types tend to be complementary. Where the market, raw materials and trainable labour exist, it is possible to establish a large plant around which can be located smaller plants supplying the larger plant with tools. It is necessary that decisions in regard to plant size should not be made on political or emotional grounds, or on the basis of theoretical prejudgments as to the desirability of plants of a certain size or complexity in a given environment, but only on a measurement of the costs and benefits of the various alternatives to the economy.

Foreign Exchange Benefits

In the course of their development, most developing countries encounter foreign exchange difficulties, arising,

probably, from crop failure or heavy capital-goods imports. It is not surprising, therefore, that the criterion often applied in judging the economic merits of industrial projects is that of foreign exchange benefits. Industrial projects are often accepted solely on the evidence, or at least the belief, that they will be substantial net savers or earners of foreign exchange. For instance, it was recommended by Ricardo Roque that in selecting industries, the Philippines Government should give high priority to:

Industries that are either dollar-saving or dollar-earning. Industries where the ratio of local to imported raw materials is higher.¹⁹

The United Nations Economic Commission for Asia and the Far East, from the answers to its questionnaire sent to the various governments of the region, concludes in this way:

A common feature in the selection of projects, and more particularly of industries, in the countries of the region is the priority to import-substitution and utilization of available domestic raw materials. This is due chiefly to balance of payment difficulties.²⁰

In particular, the Government of the Republic of China pointed out to the Commission that "the utilization of available domestic raw materials will in most instances have resulted in producing import substitutes and in saving foreign exchange."²¹

¹⁹Roque, P.R. Present-Day Philippine Economic Problems and Their Solutions. Manila. 1950, p. 49.

²⁰United Nations. op. cit., p. 49.

²¹Ibid., p. 49.

If there is good reason to consider the exchange crisis to be a short-term phenomenon with good long-term prospects, there is no justification for directing development toward acceptance of otherwise uneconomic projects as a crash programme to help solve a temporary problem which may be over soon after the projects are in operation. If, on the other hand, the exchange crisis seems to last for a long time, considering the country's existing means of offsetting it, the development of new foreign exchange earners or savers is of basic importance in correcting a structural fault in the economy.

It may be noted, however, that the development of import-substituting industries may require considerable import of semi-finished goods and new raw materials. Moreover, in the consideration of foreign exchange earners or savers, comparative advantages should not be neglected; but, in cases where it is justified from a long-run point of view, protection may be granted to 'infant industries' during the initial stage.

The Utilization of Raw Materials

Most developing countries still export the greater part of their raw materials because there are few facilities to process them locally. Ghana's main cash crop, cocoa, which is wholly processed outside the country, is a case in point. Hence, it has been suggested that in selecting industries, the developing countries should give high

priority to industries which can utilize the local raw materials. For instance, among the types of projects emphasized by the Puerto Rico Industrial Development Plan are "industries using local agricultural products, such as sugar, bagasse, tobacco.....",²² and industries using local materials, such as clay, sand, cement.

The case for the raw materials utilization criterion is a strong one. Sometimes a raw material may lie idle because it is not exportable, considering the transport costs involved. Industries are, therefore, needed to utilize them at the source. Even where the material can be exported, its local utilization is important in creating employment. However, an industry should not be created at once merely because a raw material is available. Production should begin only when it is economically justified.

Summary

The various criteria suggested for the selection of industries in the developing countries include: factor intensity; plant size and complexity; foreign exchange benefits; and utilization of raw materials. The choice of each of these criteria will, of course, depend upon the goals which the developing country concerned has set in its industrialization policy, each goal in turn depending upon

²²Puerto Rico Industrial Development Company.
op. cit., p. 43.

the existing social and economic conditions. While some projects may be clearly unsound and thus deserve elimination, considering the existing conditions, there is every degree of variation in projects which may warrant approval. The objective must be not just to obtain desirable projects, but to secure projects which rank highest in what they can provide for the developing economy. Whatever criterion is used for the selection of the industries, it is necessary to consider the possibility of locating the industries to operate economically.

SELECTION OF INDUSTRIAL LOCATIONS

Industries selected for operation in the developing countries will not flourish properly unless some consideration is given to where these industries are to be located. As has often been repeated above, the developing countries look to industrialization as a means of raising their standard of living. In this sense, their efforts must include a determination of where to locate the industries so as to result in the maximum benefit to the economy.

In their process of selecting industrial locations, the developing countries must consider the factors of location. These factors generally influence the decision of industrialists when they want to select locations for their industries.

Several industrial location theorists have

identified a number of factors which affect the suitable location of industries. For instance, McKinley Conway, editor and publisher of 'Industrial Development', has published a check list of as many as 700 plant location factors, which may enter into a plant location decision.²³ All these factors cannot be considered here, owing to the scope of the study. However, the major industrial location factors, such as transportation, raw material source, markets, labour, and energy are basic and are analyzed here for the developing countries to know the problems entailed in the selection of industrial locations. These factors have been considered most important by the location theorists and have appeared most often in empirical studies. Here, the factors are discussed in general terms.

Transportation

Transportation is one of the most important location factors which the developing countries must consider in selecting an industrial location. Edward Lynch of the United States National Resources Planning Board points out that the peculiar importance of transportation as a location factor arises from the fact that location is a matter of spatial considerations, and that transportation

²³Conway, McK., Jr. "700 Plant Location Factors". Industrial Development. 4:17-20, No. 11, October, 1957. See also Appendix 1.

costs are the price for overcoming distance.²⁴

Assuming that all costs to an industry, except those of transportation, are constant and the same at any location, the choice of location is determined by ascertaining the site with the lowest transportation cost. From this standpoint, the industry would then locate either near the market or near the source of the raw material in order to reduce the transportation cost. The choice of the particular site will depend on the relative cost of transporting the raw materials and the finished products. Processing will take place near the market if it costs less to transport the raw materials than the products, and near the source of material if the situation is reversed. Here, it is assumed that there is little or no gain or loss to the products during the manufacturing process. However, where there is considerable weight loss during fabrication, such as is the case with the manufacture of pulp from wood, the locational pull towards the source of material will be greater. On the other hand, when a weight-giving process is involved, such as the manufacture of drinks, the plant tends to be attached to the market.

In an industry, which uses several raw materials and sells to different markets, the problem of seeking the point of minimum transportation cost is not simple, though

²⁴Lynch, E.S. Transportation, Industrial Location, and Natural Resources. Washington, U.S. National Resources Planning Board. U.S. Government Printing Office. 1943, p. 186.

the same principles, as outlined above, apply. "To the extent that one material or one product involves greater cost of movement than others, its source or market will have a correspondingly greater influence."²⁵ In this case, however, competition among producers may be less direct and the pressure on transportation cost somewhat reduced.²⁶

The problem of seeking the point of minimum transportation cost is further complicated by the fact that transportation cost is dependent upon other factors. First, it varies with the medium used, that is, by water, rail, road, or air. Hoover points out that transportation by water is generally the cheapest where time is not an important factor, whilst transportation by air is the most expensive.²⁷ Which of the media used will depend mainly upon the time required for the raw materials to reach the plant or the finished products to reach the market in relation to the cost of transportation.

The availability of water transportation may be an important element in plant location where large quantities of low value materials have to be moved at cost. The importance of Pittsburgh in steel making is attributed largely to waterways.²⁸ Rail lines also play an important role in the

²⁵Ibid., p. 187.

²⁶McLaughlin, M. and Robock, S. Why Industry Moves South. Washington, National Planning Association of the South. 1949, p. 85.

²⁷Hoover, E.M. op. cit., pp. 15-25.

²⁸Greenhut, M. Plant Location in Theory and Practice. Chapel Hill. University of North Carolina Press. 1956, p. 36.

transportation of other heavy materials, such as coal, ores, etc., while the air lines handle high-value commodities and expedited shipments.²⁹

Rapid transportation is essential in some industries in order to minimize interest charges on capital tied up, and also on storage costs. Lynch cites zinc and electrolytic copper as a case in point.³⁰ This product is customarily sold at delivered prices including the interest charges on the value of it while in transit.

Cost of transportation is also dependent on the rate structure. Rates not only vary for different products, but they also tend to decline as the distance of the haul increases. This makes the total transportation charges lower if the plant is located near the raw material source or at the market than anywhere else, since the total cost of the two short hauls is greater than that of a single long haul. Thus, unless processing costs at some other point are low enough to affect the difference in transportation cost, manufacture will tend to occur near either the market or the source of material.³¹

As rates are usually higher for finished products than for raw materials, there is a tendency for manufacturing to be located away from the material source and close to the

²⁹McLaughlin, M. and Robock, S., op. cit., p. 90.

³⁰Lynch, E.S., op. cit., p. 187.

³¹Ibid., p. 188.

market.³²

Because of the relative immobility of resources, changes in freight rates do not usually have an immediate effect on industrial location, although in some cases it may cut off some producers altogether. An increase in transportation costs may, for example, be borne either by the producer, by his suppliers, his customers, or shared by all, without changing the location of manufacturing.³³ But with time, changes in freight rates, in particular the differences in rate between materials and finished goods, and changes in the form of service, may alter the geographical pattern of industry.³⁴

To sum up, it may be said that transportation is an important factor determining the location of an industrial activity and for this reason it must be considered by the developing countries when selecting industrial location. Whilst the costs of transportation vary in different locations for different industries, they determine whether an industry should locate at the source of the raw material or near the market. The determination of the point of minimum transportation cost is complicated by such factors

³²Ibid., p. 188.

³³Ibid., p. 190.

³⁴McLaughlin, M. and Robock, S., op. cit., p. 95.

as the medium of transportation used, the rate structure, the market served, and the multiplicity of the materials used.

Transportation is only one of the industrial location factors which can influence the locational decisions of the developing countries. Others, such as raw materials, market, and labour, are also important in locational considerations as they affect the costs and receipts of an industry.

Raw Material Source

Another factor which affects industrial location, and which the developing countries must consider when selecting industrial locations is raw material source. Historically, as Yaseen points out, the location of industries has been greatly influenced by the proximity to raw material sources.³⁵ Today, however, technological advance, which brings with it the possibility of utilizing synthetic materials and rapid transportation, has greatly reduced the importance of the raw material source as a location factor. Yet, in some industries, because of their special characteristics, the source of raw materials is critical in industrial location considerations.

Only in certain regions of the world can there be found reliable and adequate food surplus above local con-

³⁵Yaseen, L.C. Plant Location. New York, American Research Council, 1956, p. 26.

sumption, and industrial establishments utilizing food stuffs will regard problems of supply and procurement as important in industrial location considerations. In the same way, industrial processes, which draw on the products of other manufacturing for their raw materials will carefully balance the advantages of a location close to their suppliers against those at some other point. "In every case, the availability, reliability and costs of material procurement must be considered, although the power of such considerations to influence location decisions may vary according to a variety of circumstances apart from mere procurement costs."³⁶

Industries utilizing materials which lose weight in the course of the processing tend to be attracted to the source of the materials in order to reduce transportation costs. For example, pulp and paper, newsprint, and other paper manufacturing industries tend to locate near the place where pulp-wood is available.³⁷ Other industries using low-valued, heavy, and bulky raw materials also tend to locate in the proximity of their raw materials source. Among these are brick manufacturing from clay, the ginning of cotton, and the sawing of lumber.³⁸

³⁶Estall, R.C. and Buchanan, R.O. Industrial Activity and Economic Geography. London. Hutchinson University Library. 1961, p. 25.

³⁷Estall and Buchanan give examples of the extent to which some raw materials lose weight in the course of their processing: Raw sugar is about 1/8 of the materials used; pulp and paper, 2/5 of the pulp; weight of pig iron is about 1/4 to 1/3 of the materials charged. Ibid., p. 26.

³⁸Smith, R., Phillips, O., and Smith, T. Industrial and Commercial Geography. New York. Henry Holt and Company. 1955, p. 270.

Perishability of the materials has been mentioned by McLaughlin and Robock as another factor which causes certain industrial establishments to locate near the raw material source.³⁹ Examples of these are vegetable canning and processing, dairying, and meat packing industries.

Generally, where the industries are predominantly raw material users, the source of the materials has a definite raw material attraction. The United States Bureau of Census defines raw material consuming industries as those in which the expenditures for raw materials are more than half of the total.⁴⁰

The locational pull to the source of raw materials is greater in industries using materials of low value than it is for industries using materials of high value. The United States National Resources Planning Board reports that for manufacturing industries the percentage of material cost to the finished product value in 1939 ranged from 31.5 to 77.1 per cent. Food products, tobacco manufactures, petroleum products, nonferrous metals and their products, automobile and automobile equipment belong to those industries where the cost of material is highly significant. Thus, these industries tend to locate their processing factories near the sources of the raw materials.⁴¹

³⁹McLaughlin. op. cit., p. 18.

⁴⁰National Resources Planning Board. op. cit., p. 133.

⁴¹Ibid., p. 129.

Where many different raw materials are involved in a single processing procedure, the locational influence of the source of materials will depend on their relative importance. A strong locational pull of one may be countered by an equally strong pull of a second material. The iron and steel industry uses several important raw materials, and the plant locations based on relative access to coal or to ore or to scrap can be found.⁴² In general, the greater the combination of materials required, the less is the locational influence of any one factor.⁴³ This may result in more emphasis being given to locational factors other than raw materials.

When other location factors, such as transportation, labour, or market are considered together with raw materials, it is the cost of the latter which demands a major consideration. In this cost is included the cost of transporting the raw materials to the processing site.

It can be said, in summary, that the importance of the source of raw materials has declined as a locational factor due to technological advance. However, its influence is still in the forefront of locational consideration of industries in which the cost, availability, reliability, perishability, and bulk of the materials are all critical.

⁴²Estall, R.C. and Buchanan, R.O. op. cit., p. 27.

⁴³National Resources Planning Board. op. cit., p. 136.

Where different kinds of materials are involved in a single processing, the pull of one material source is reduced by the pull of the other material sources. When other factors are considered with raw materials the cost of the materials is considered the most important.

Markets

While the influence of the source of raw materials on industrial location decisions has been declining over the years, as a result of advances in technology, the importance of markets as a location factor still remains great. In recent times, in particular, the importance of the markets has very much increased owing to the change in the character of industry as a whole, and the present necessity of speedy and regular delivery of goods.⁴⁴ This brings out the importance of markets as a location factor which must be taken into account when the developing countries are selecting industrial locations.

Harris points out that although the iron and steel industry is a raw material processing industry, it has now become more and more market-oriented. The Fairless Steel Works on the Delaware River in New York State, for example, is located there because of the low cost of water transportation and the nearness of the markets.⁴⁵

⁴⁴Political and Economic Planning. op. cit., p. 72.

⁴⁵Harris, C., "The Market as a Factor in the Location of Industry in the United States." Appraisal Journal. January, 1956. pp. 57-86.

Markets are made up of the ultimate consumers, industrial consumers, and other organizations which handle the commodities for further distribution.⁴⁶ Estall and Buchanan give several reasons why an industry may be influenced to locate near the market.⁴⁷ Most of these reasons are the converse of the forces attracting an industry to its major raw materials.

In the first place, where the transportation charges form a large percentage of the selling price of the finished products when they are transported over a great distance, an industry will tend to locate near the market in order to minimize transportation cost. Hence, industries whose finished products are bulkier than the raw materials are market-oriented. Among such industries are the manufacture of agricultural machinery, printing presses and large machine tools.⁴⁸ A typical example of locating near the market to maximize transportation costs is the location of a 'du Pont' sulphuric acid plant at Richmond, Virginia, which is mainly to provide its company with sulphuric acid, the manufacture of which involves a weight-gaining process.⁴⁹

⁴⁶Ibid., p. 57.

⁴⁷Estall, R.C. and Buchanan, R.O. op. cit., pp. 31-35.

⁴⁸Ibid., p. 32.

⁴⁹McLaughlin, M., and Robock, S. op. cit., p. 32.

Personal contact between consumer and producer, and securing an increased share in the business have also been cited as reasons why market orientation is very necessary.⁵⁰ Any industry which makes articles 'to measure' gains from market orientation. "This applies not only to retail bespoke garment industry, but to many manufacturing concerns which specialize in the production of small 'tailor-made' parts for other enterprises or for private customers."⁵¹ In the same way, industries such as photoengraving, newspaper publication, and various repair industries, where customers' specifications must be satisfied, need to locate near the market to secure an increased share in the business.⁵²

Where the product of an industry is perishable, market location is attractive if not essential. Market-oriented industries such as ice, ice cream, and beverage industries belong to those where the perishability of the finished product is of major importance in deciding on a location.⁵³

The market under consideration may be localized to a certain extent or spread over a large area. In other words, it may be local, regional, national, or even international in scope.⁵⁴ In the last three cases a compromise

⁵⁰Estall, R.C. and Buchanan, R.O. op. cit., p. 33.

⁵¹Ibid., p. 32.

⁵²U. S. National Resources Planning Board. op. cit., p. 220.

⁵³Ibid., p. 220.

⁵⁴McLaughlin, M. and Robock, S. op. cit., p. 31.

solution to the location problem may have to be taken. For example, if the finished goods are sold all over the country, it would not be possible to locate the plant near all its markets. Two ways are open. The plant could either be located at a point where the transportation costs for its particular group of markets are minimized, or it could go to the place where the major market is situated. In both cases, however, something must be sacrificed. In the first case, it loses the ready access for service to the customers, whereas in the second case the transportation charges are likely to be higher.

In conclusion, it may be said that markets are also a factor which the developing countries must consider when selecting industrial locations. Market location is critically important for industries whose products are weight-gaining, fragile or perishable. Where the finished goods are sold to several markets, a location near all the markets, however desirable, is technically not feasible. In this case, the industrialist would have to be satisfied with a compromise solution.

Labour

OUR HUMAN RESOURCES are the most valuable resources we have. So-called 'natural resources' are never worth very much without the energy, drive and ambition of people.

HENRY FORD II

It has been contended by Yaseen that the selection of a general geographic area for the location of a plant is based on raw material costs, market accessibility, and

economic consideration, but that the labour factor determines the particular community in which the industry should be located.⁵⁵

It is true that the influence of labour as a location factor has declined due to mechanization.⁵⁶ But the fact that no industry can possibly operate without labour makes labour consideration critical in the industrial location decision process. In the labour-oriented industries, in particular, the importance of the labour market can hardly be over-emphasized.

Estall and Buchanan give three reasons why the location decision of every industrialist can be affected by labour considerations.⁵⁷ The reasons are that: first, labour varies in costs from one place to another; secondly, there are geographical variations in labour supply; and, finally, labour varies in skills from one area to another.

Labour Costs

Labour costs are a significant feature of the labour situation in the industries where labour costs take a greater proportion of the total production costs. Under this circumstance, the industry will choose between the

⁵⁵Yaseen, L.C. op. cit., p. 50.

⁵⁶Ibid., p. 52.

⁵⁷Estall, R.C. and Buchanan, R.O. op. cit., p. 84.

areas of high and low wage rates. The United States National Resources Planning Board points out that wage rates vary between towns and cities, and suggests that the differences are a reflection of differences in cost of living, in other non-monetary advantages, or differences in bargaining power, each of which is often sufficient to restrict mobility of labour, thereby barring equalization of wage levels.⁵⁸

A low wage rate in any particular area does not necessarily attract industry. In order that this may be so, the ratio of the labour cost to the total cost of the product must be sufficiently high to override other location factors.

Labour attitude is another factor which can lead to high labour costs. In the more established industrial areas, trade union activities, such as strike, can lead to stoppage of work, and thus result in high costs. An industrialist will naturally think before he puts his plant in such an area. In their book, 'Why Industry Moves South', McLaughlin and Robock, examining the reasons for the location decision of eighty-eight firms, show that, almost without exception, the firms concerned made a thorough study of the history of labour-management relation in the areas they were considering before they made a final decision.⁵⁹ Labour attitudes can also affect productivity and thus result in high production costs. This happens especially where trade union members are opposed to innovation and increased 'work load', which

⁵⁸National Resources Planning Board. op. cit., p. 221.

⁵⁹McLaughlin and Robock. op. cit., p. 36.

could be made possible by mechanization.⁶⁰ Many present-day industrialists consider labour turn-over as one of the measurable indicators of labour-management relations in a community.⁶¹ Yaseen suggests that a monthly net turn-over rate in the average manufacturing establishment should not be more than five per cent, although in such industries as logging or ship building this figure may go up to as high as eleven to twelve per cent.⁶²

To sum up, where labour costs are significant in total production costs, an industry will tend to locate in a community where cost of labour can be kept to the minimum. This can be possible by a careful consideration of wage rates, size of towns, and the labour-management relations.

Labour Supply

Labour supply, also, can influence an industrialist in his location decision. The size of the labour force varies from one community to another. Generally, the largest labour markets are in large cities with their correspondingly higher wage rates rather than in smaller towns. However, for a labour-oriented industry a large labour market makes it relatively easy to select, recruit, and lay off workers without difficulty that may accompany such a decision in a small or one-industry town. Estall and

⁶⁰Ibid., p. 37.

⁶¹Ibid., p. 38.

⁶²Yaseen, L.C. op. cit., p. 76.

Buchanan cite an instance in Australia, "where, at Broken Hill, many employees, made redundant by a (possibly temporary) decline in demand for lead in 1958 and 1959, were carried on the companies' payroll because there was no alternative employment in the town".⁶³

The quantity of labour is not the only factor that affects labour supply considerations. "The type of labour is also important, its age, sex structure, the level of industrial capability, and so on."⁶⁴ Male and female labour are generally in 'joint supply', that is, where the one exists the other will often be available. Thus, an area with industries employing a large percentage of males may well be a favourable place for industries utilizing female labour. The original cause of the location of the female-oriented rayon industries in the Pennsylvania anthracite region has been attributed to the already existing large male labour force.⁶⁵

Labour oriented industries can draw upon a large pool of satisfactory labour in most advanced industrial areas. Reared in an industrial environment, the population possess a minimum of industrial skill and technical 'know how'. They can adapt themselves readily, comparably, to the various requirements of industrial work. The training period can be generally short in the majority of jobs in

⁶³Estall, R.C. and Buchanan, R.O. op. cit., p. 89.

⁶⁴Ibid., p. 89.

⁶⁵Ibid., p. 90.

industry. The situation is quite different in a less industrially developed area, where industrial labour supply is a problem. "Here even the most basic elements of industrial 'know how' are often lacking, and industrial life is completely foreign to the vast majority of the people."⁶⁶ The industry which locates in such an area has to incur cost of training, and if there is a choice between developed and less developed areas it would be economically unjustifiable to select the latter. Where the industry has to locate in the less developed area, mechanization may be substituted for labour. The present-day change from labour to machines in India, in spite of the country's cheap labour, is a case in point.⁶⁷

Labour supply can also be affected by institutional factors. These institutional factors may be of a legal or organizational nature. For instance, there may be legal restrictions on the use of labour, the hours of work, standard of employment, minimum wage and minimum age for employment, and other legal requirements affecting labour supply. Trade unions can also restrict labour supply by the operation of the 'close shop'. Such a practice can check inter-industry mobility of labour and thus make labour relatively scarce. These institutional factors can influence an industrialist's locational decision since they are related to cost of production.

⁶⁶Ibid., p. 90.

⁶⁷Ibid., p. 91.

Consideration of labour supply must be in the forefront of the location decision of industrialists especially where their industries are labour-oriented. In every industry institutional factors demand great consideration in skill so far as they affect labour supply and cost.

Skill

Skill is another characteristic of the labour market that may affect all firms, though in different degrees. Recent technological advances are reducing the relative importance of skill as a location factor. In the cotton industry, for instance, many operations which used to be performed by hand are now mechanized.⁶⁸ However, in some industries, especially where manual skill is needed, the influence of skill as a locational factor is great. 'The Report on the Location of Industry in Great Britain' states that "the process of replacement of skilled labour by machinery has not diminished the demand for skilled labour so much as changed the nature of demand".⁶⁹ Superskilled men are required for the maintenance of intricate plants and other specialized jobs such as tool-making. The availability of these men may have some influence on industrial location. However, it is believed that their locational influence tends to be neutralized as they are considered

⁶⁸Political and Economic Planning. op. cit., p. 65.

⁶⁹Ibid., p. 66.

the most mobile of all classes of labour.⁷⁰

Despite the fact that its importance as a location factor has declined due to technological changes, labour consideration still influences all industries, though in varying degrees, because all industries need some labour. In the labour-oriented industries, in particular, the influence of labour is in the forefront of a locational decision. The importance of labour considerations arises from the fact that there are geographical variations in labour costs, supply, and skill.

On the whole, labour is the most complicated of all the locational factors considered so far, because, varying with the geographical distribution of population, which also makes up the ultimate consumers, its influence can hardly be separated from the influence of the market. In addition, its influence is unpredictable for its nature can change with time: its supply can change with changes in population; its costs can change through institutional activities; and its skill can change through training. The United States National Resources Planning Board sums this up by saying that:

.....the disadvantages of locating an industrial plant away from the sources of labour are so intermingled with perhaps even stronger disadvantages with respect to the other locational forces, that no accurate estimate can be made of the independent effect of labour on location.⁷¹

⁷⁰Ibid., p. 68.

⁷¹National Resources Planning Board. op. cit., p. 231.

Energy

Another location factor which the developing countries must consider when selecting industrial locations is energy. This factor has always been an important factor in industrial location decision. In Great Britain in the eighteenth and nineteenth centuries, and in the United States and Europe in the nineteenth century, energy source determined the geographical distribution of manufacturing, first, on the site close to water power, as shown by the early concentration of industries in Perthshire,⁷² Scotland, and Lowell, Lawrence and Patterson in the United States.⁷³ Later, with advances in technology resulting in the production of steam power and natural gas, the 'pull' of water power declined.⁷⁴ Today, development in electric power, which is uniquely mobile over limited distances, flexible in application, and available at the flick of the switch, are reducing the influence of energy on industrial location decision. But, it is still an important factor of location because all industries need power and fuel, though in different degrees, and because areas vary in energy supply.

The locational attraction of energy depends on the

⁷²Turner, W.H.K. "The Significance of Water Power in Industrial Location". Scottish Geographical Magazine. Vol. LXXIV No. 2. September, 1958, p. 36.

⁷³Estall, R.C. and Buchanan, R.O. op. cit., p. 54.

⁷⁴Ibid., pp. 54-55.

extent to which energy is used in a manufacturing process. For certain electroprocess industries where energy consumption forms a large part of the value of the product, power costs are definitely a dominating, although not necessarily the sole, locational considerations. Among these industries are: calcium carbide, aluminum, electrolytic zinc, magnesium, and electrolytic soda. The production of aluminum metal by electrolysis of fused alumina, especially, requires cheap hydroelectric power more than anything else, whereas for the production of magnesium, cheap power stands about on an equal footing with availability of materials.⁷⁵

Low-cost power alone is, however, not sufficient to create an industrial area with a wide range of diversification, as there are only a few specifically power-oriented industries. But when cheap power and raw materials suitable for electroprocessing industries occur concurrently, a basis may exist for industrialization on a substantial scale.⁷⁶

The National Resources Planning Board gives four categories in which energy plays a role, with different degrees, in the location decision.⁷⁷

In the first place, the industries in which energy orientation is the dominant factor are the consumers of fuels as raw materials. In this group are the coke and carbon black industries. In a second group of industries, fuel has

⁷⁵National Resources Planning Board. op. cit., p. 177.

⁷⁶Ibid., p. 180.

⁷⁷Ibid., pp. 167-180.

played an important role in plant location together with consideration for the factors of raw materials and markets. Belonging to this group are industries such as glass, which uses natural gas as fuel; clay products, which use coal or gas; metal refining and fabrication and chemicals, which use coal and gas as fuel. In a third group, materials and markets are the dominant factors, but raw materials are so widely available that fuel costs also play some role in locational decisions. This group is represented by the paper, cement, and lime industries. And finally, there is a fourth group in which other factors override the fuel factor in importance, although the industries concerned consume a great deal of fuel. Typical examples are manufactured ice, which is market-oriented, and naval stores and salt, which are raw material-oriented.⁷⁸

To sum up, it may be said that energy is an important location factor which the developing countries must take into consideration when selecting locations for industries. The importance of energy will be greatly felt especially where the envisaged industry is a large energy consumer.

Summary

Problems of selecting an industrial location have been examined by considering the factors which generally affect industrial location. Examples of the importance of each locating factor have been cited from the more developed

⁷⁸Ibid., p. 180.

countries, such as Great Britain and the United States, because, having developed through industrialization, these countries have encountered and solved problems in the selection of industrial locations. The developing countries can learn from their mistakes and successes.

In summary, it may be noted that the developing countries can appreciate the problems of locational selection when such industrial location factors as transportation, raw materials, markets, labour, and energy are considered. These, however, are not the only factors, though they are the most significant ones; other factors are taxation, attitudes of the community, and climate, which may not significantly affect the decision of a country bent upon industrial development.

Nor can it be said that any one of the more significant factors, discussed above, overrides all others in importance in a location decision, except in some few industries which are oriented either to the market, raw materials, labour, or energy. In most cases several of the location factors together influence the final selection of a location with none of the factors playing an all-important role. The cutlery industry in the Sheffield district has been cited in 'The Report on Industrial Location in Britain' as a good example of this interplay of factors:

The cutlery industry began in the Sheffield district some four or five hundred years ago. An iron industry based on local coal-measure ironstones, charcoal supplies and water power had existed long before, but specialization in cutlery was made possible by the excellent grind stone material

provided by the local millstone grit, and it was encouraged by the advent in the sixteenth century of skilled Flemish settlers. Skill tended to accumulate in the district and the industry has remained highly localized there. The discovery of stainless steel by Sheffield manufacturers some twenty-five years ago has emphasized the supremacy of the district in cutlery manufacture.⁷⁹

Here, three of the primary factors, raw materials, water power, and skilled labour, have combined to locate the cutlery industry in Sheffield.

The developing countries must also be aware of the changing importance of the location factors. Industrial traffic has, over the years, relied on waterway, railway, and road transportation. Today, air transportation is also becoming important for special kinds of products. These changes in industrial transportation, resulting in speed and lower production costs, are likely to reduce the influence of transportation as a locational factor.

Likewise, the shift from water power, through steam power, to electricity, which can be transmitted over a distance, is reducing the energy influence on locational decision. Labour also has declined in importance as a location factor owing to mechanization of processes. In the developing countries, however, where the people lack the basic industrial 'know how' the factor labour can be critical in industrial location decision. The lack of technical knowledge can be overcome by training. Finally, the source of raw materials has declined in importance as a location factor

⁷⁹Political and Economic Planning. op. cit., p. 86.

because the chain of processing between raw materials and the final products has become longer and longer, and, also, because the tendency of any plant to use semi-processed materials continues to grow.⁸⁰

All these examples illustrate the changing nature of the industrial location factors, which the developing countries must consider very carefully. Thus, it may be concluded that the problems of locational selection are complicated by the diversity of the factors involved and the nature of these factors. All these make it difficult, if not impossible, to use any formula for selecting an industrial location. Dr. Turner concludes:

In appraising the industrial location possibilities of an area, it is important that the particular factors affecting that area be studied and analyzed, rather than attempting to apply some magic formula that is not applicable or appropriate.⁸¹

FACILITIES SUPPORTING INDUSTRIAL LOCATION

As far as the developing countries are concerned, an examination of the problems of industrial location can hardly lose sight of the facilities, such as transportation and communication facilities, utilities, industrial parks, housing, industrial education and training, commercial facilities, and other community services, which support

⁸⁰Chinitz, B. and Vernon, R., "Changing Forces in Industrial Location". Harvard Business Review, Vol. 38, January-February, 1960, pp. 126-136.

⁸¹Turner, O.D., Industrial Location Factors in Wyoming, A Functional Analysis. An unpublished doctoral dissertation, The University of Texas, January, 1958, p. 218.

industry. In these countries, these supporting facilities and services are either absent, or existing but poorly developed. Industries cannot operate well where the supporting facilities are of low standard; hence, the provision of the facilities is very essential. Some of these are needed for the actual manufacturing process, others for the manufacturing employees, and some for both process and employees.

Transportation

In its broadest sense, transportation facilities related to industrial location include harbours, railways, highways, and airports.⁸² The lesson taught by the industrialized countries is that these facilities are essential to the efficient operation of industry.

Harbours

Harbours are needed especially where the raw materials required for domestic processing are imported or where the products are intended for the overseas markets. Under such circumstances, harbours are necessary for assembling the materials or the products. Industries utilizing heavy or bulky imported raw materials would tend to locate at or near the harbours, thus creating industrial concentration from which the industries can gain by supplying one another with materials and services.

⁸²Breese, G., Industrial Site Selection. Princeton, N. J. The Bureau of Urban Research. 1954, p. 23.

Railways

Railways are also very important transportation facilities which support industries. In the nineteenth century Britain, railways allowed a readier movement of raw materials to a greater variety of locations, and products to many markets. Today, they are still important in all industrial areas as carriers of industrial traffic, especially over long distances.⁸³ In the developing countries, railways are needed to connect industrial areas and raw material sources, and also, industrial areas and the markets.

Highways

In the twentieth century, road transportation has become important as carrier of industrial goods. To many modern industries, both light and heavy, the flexibility of trucking is very valuable in the procurement of raw materials, and the distribution of the finished goods. In the United States, for instance, although distances covered are long and, therefore, more favourable to movement of other forms, road transportation has been gaining ground steadily.⁸⁴ Transportation of employees to work in recent years has also made road transportation extremely important.⁸⁵ All these examples show that well laid-out roads are essential to industrial development. Good roads give industry

⁸³Estall, R.C. and Buchanan, R.O. op. cit., p. 43.

⁸⁴Ibid., p. 44.

⁸⁵Ibid., p. 45.

more freedom in site selection and more flexibility in work scheduling. Good roads, properly maintained, and with reasonable regulations for their use, are thus of considerable importance in the healthy operation of the industries.

Airports

Finally, airports, serving both internal and external air traffic, are also needed to facilitate the speedy transportation of managerial personnel and high quality goods. Having airport facilities accessible for personnel transportation permits flexibility in management of dispersed operations and thus decentralization of large manufacturing units. It is effective in providing rapid contacts with dispersed buying and selling representatives. Time savings affected by the use of airways are considerable for high-salary and strategic personnel.⁸⁶

In summary, it may be said that transport facilities, such as harbours, railways, roads, and airports, support industries to operate efficiently. Their provision must, therefore, be given great consideration by the developing countries in their industrial development programmes. The provision of these facilities will necessitate comprehensive planning and a great co-ordination between industrial and transport authorities.

⁸⁶Breese, G. op. cit., p. 26.

Communication

In most developing countries today, communication systems exist but are relatively undeveloped. Moreover, the distribution is restricted to the few towns and cities, leaving the rural areas unserved. The low standard and restricted distribution of communication facilities in Puerto Rico, as pointed out by the framers of the Puerto Rico Industrial Plan, is a case in point.⁸⁷

Improvement and extension of the existing communication system, and additions to the system, where it is deficient will be necessary to support future industrial development. Adequate telephone and telegraph service is an essential requirement of a highly developed economy. Frequent and efficient communication is a matter of necessity for practically all types of business and industry.

Utilities

Industries are very sensitive to availability of utilities necessary to their operation.⁸⁸ Particularly crucial are water and electricity.

Water

Water is an essential requirement of all industrial plants and a vital raw material in many, being used variously

⁸⁷Puerto Rico Industrial Development Company. op. cit., p. 131.

⁸⁸Breese, G. op. cit., p. 40.

in processing, in steam raising and in cooling. Industrial use of water has grown rapidly in this century and several United Nations publications have suggested that the use of water per capita outside of agriculture could be a good index of the standard of living.⁸⁹ This points out the importance of water in industrial areas. The supply of water, that is, its quantity and quality, must be adequate for industry.

Industries, such as metal and chemical industries, needing a large amount of water for processing, cooling, and washing, may have to locate near a water source. But for a large number of plants, water must be brought to industrial sites.

Water is a natural resource, and to take advantage of it, it is necessary that action be taken to protect and develop the future water supply. Groundwater surveys must be undertaken to determine the quantity and quality of the supply. The potential surface supplies must be protected by the control of development within the reservoir sites and in the watersheds tributary to these sites.

Electricity

"Among those utilities indispensable to economic development, electricity is one which aids general development most directly and which, therefore, is given a high

⁸⁹See, for instance, United Nations. Department of Economic and Social Affairs. Water for Industry. New York. United Nations. 1958, p. 17.

priority."⁹⁰ The use of electric power is becoming universal in present-day industry owing to transportability and increases in the transmission voltage of electricity. In Sweden, for example, electricity generated at Harspranget is sent, at 380,000 volts alternating current, six hundred miles to the south with only a seven per cent loss in transportation.⁹¹ For this reason, electricity makes it possible for industries to be distributed away from the source of energy.

It is true, as Estall and Buchanan point out, that electric power is just another way of utilizing the primary energy sources,⁹² but the fact that electricity can be produced from water makes electric power worthy of consideration in industrial development programme. Water is more available in most regions than other sources of energy, such as coal. What the developing countries must do is to find the possible ways of harnessing their water supply to produce hydro-electric power to cater to the needs of industry.

Industrial Parks

Industrial parks or planned industrial districts, as they are known in the United States, are also supporters

⁹⁰Puerto Rico Industrial Development Company. op. cit., p. 127.

⁹¹Estall, R.C. and Buchanan, R.O. op. cit., p. 64.

⁹²Ibid., p. 61.

of industry. The industrial park is a relatively new concept in the field of industrial development. Although a few such industrial parks were in operation in 1900, they have come into significant use only since 1940, especially in the United States and Great Britain.

In the United States, the importance of an industrial park to the efficient operation of industry can hardly be over-emphasized. An industrial park can give a prospective industry many advantages not otherwise available in an isolated, undeveloped, or a central location. It can offer transportation facilities, utilities, custom designed buildings, financial assistance, off-street parking, and freedom from encroachment by other uses.

For a community, an industrial park offers the advantage of industrial concentration in areas most appropriate to its operation, thus easing the problem of providing city services and traffic control, and eliminating the nuisances inherent in small industrial sites. Pleasant exterior design allows the park to blend with its neighbours, and planned industrial working space provides a higher standard of working conditions for employees.

To sum up, it may be said that industrialization in the developing countries would be facilitated by the establishment of industrial parks by the development agencies. These parks may be given out to private industrialists to rent, or may be used by the agencies themselves to operate their industries.

Housing

The importance of housing to industrial location is obvious; the labour force must be well housed to keep it at that location. The provision of housing facilities includes housing of an adequate design, and suitable for several classifications of manufacturing personnel. If an area is to be a successful location for industry, it must meet demands for housing from all employees whether at unskilled, skilled, or executive levels. Generally, as Breese points out, the bulk of the demand for housing in terms of its effect on potential industry tends to centre around homes for the workman.⁹³ "A factor that is usually either overlooked entirely, or at most given only incidental attention, is that executives need housing too!"⁹⁴ An industry, considering a large city as a potential location, does not have to assign much weight to this factor, the urban area ordinarily having adequate supply of high-grade dwellings. But in considering a location in smaller towns, this factor can be very important - indeed, even decisive - in view of the sometimes arbitrary nature of the decision-making process.

It is necessary that the location of public and private low cost housing projects for industrial workmen

⁹³Breese, G., op. cit., p. 49.

⁹⁴Ibid., p. 49.

should provide ease of access from residential areas to the proposed industrial sites. This is necessary to reduce transportation costs and will result in making available a greater number of industrial workers. In the larger cities, the location of industrial worker residences convenient to their place of employment will reduce the strain on urban transportation systems and thereby reduce urban traffic congestion.

Commercial Facilities

Industrial workers naturally need food, clothing and other basic necessities. For this reason, lack of adequate commercial facilities would give rise to difficulties in procuring the necessities and thereby result in the low standard of living of the workmen. Moreover, private industrialists are reluctant to locate their plants outside the larger cities because of the limited commercial facilities available to them and their families.⁹⁵ For all these reasons, industrialization would be benefited directly from improvements in commercial facilities.

Improved distribution and improvements in the range and quality of commercial goods, particularly food, will aid the economic development programme in raising the level of living. In addition, improved commercial facilities will help to stabilize the population of the smaller towns and

⁹⁵Puerto Rico Industrial Development Company. op. cit., p. 132.

cities by making them more attractive to their inhabitants and thereby reducing the population flow to the larger urban areas with attendant strain on the urban facilities.

Recreation, Health, Education, and Welfare Facilities

Like commercial facilities, recreational, health, education, and welfare facilities keep industrial workers at an industrial location. Lack of schools, hospitals, parks and community centres affect the total economic programme in general, and industry in particular.

In most developing countries, some of these facilities are provided, but only in the larger towns.⁹⁶ The people in the rural areas become conscious of their lack of these facilities and are, therefore, influenced to move to the larger cities, where these facilities are more available. This population movement exerts a considerable strain on the larger urban areas. Sometimes this strain is reflected in mushrooming slum areas, depleted water resources, overtaxed school and health facilities and urban congestion in general.

If industrial distribution is needed, it is necessary that the standards of these facilities in the smaller towns are raised. Where they do not exist, they must be provided so as to keep the labour force stable at the industrial sites, to stabilize the urban population of

⁹⁶Puerto Rico's situation is a case in point. Ibid., p. 133.

the smaller cities and towns, and thereby reduce the strain on the larger cities.

Vocational Training and Education

In most developing countries today, labour supply is a major problem, not because the labour force is scanty but because it is largely untrained. Here, even the most basic elements of industrial 'know how' are often lacking, and industrial life is completely foreign to the vast majority of the people.⁹⁷ Such circumstances pose great problems in industrial development. Vocational training and education are important in offsetting these obstacles to industrialization.

Vocational schools for production workers, and professional training for management and supervisory personnel are the means to providing trained men for industry. In addition, there would be need for creating an 'industrialization state of mind'. People must be educated to accept industry as a field in which they can earn a living. The framers of the 'Puerto Rico Industrial Development Master Plan' put the importance of industrial education in this way:

.....it is not the raw material of the Island, but the industrial skill, will, and interest of the people that will support future industrialization. Capital will venture where there are opportunities, but first there must be willingness to make these opportunities possible.⁹⁸

⁹⁷Estall, R.C. and Buchanan, R.O. op. cit., p. 90.

⁹⁸Puerto Rico Industrial Development Company. op. cit., p. 134.

Industrial training and education are basic services which must be provided so that industry may have skilled personnel. The acceptance of industry as an occupation, made possible by industrial education, can result in a higher productivity, since absenteeism can be kept to a minimum.

Summary

Supporting facilities have been considered in terms of transport and communication, utilities, housing, commercial facilities, recreational, health and welfare facilities, and industrial education. Some of these are needed for the actual manufacturing process, whilst others are needed to keep industrial workers at industrial locations. In this sense, their absence or inadequacy pose great problems for the efficient operation of industry.

In summary, it may be said that it is necessary that the developing countries give considerable thought to the supporting facilities in their development programmes. The facilities may be more expensive than the industries which they support but they must be provided if industries are to operate effectively. Most of the facilities exist in the towns but are absent or inadequate in the villages. The problem is one of comprehensive planning for industry, together with supporting facilities, if regional distribution of industry is to be achieved.

CONCLUSION

Problems of industrial location in the developing countries are a complex set of problems. They include the identification of national industrialization goals; problems of selecting industries; problems of selecting industrial locations; and problems of providing supporting facilities to assist the efficient operation of the industries.

Every developing country has specific goals which industrialization is presumed to achieve. These goals must be identified specifically so that the country concerned may know the types of industries to select in order to achieve its goals. Most developing countries have identified one or a combination of the following industrialization goals: an increase in income per capita, earning or saving foreign exchange, and full employment of both human and natural resources. Some of these goals may be emphasized more than others in a single industrialization programme. Clear identification of the goals is, therefore, necessary for a rational selection of industries.

For a selection of industries to operate in the developing countries, various criteria have been suggested by some international bodies and development economists. Some of the criteria suggested are: factor intensity; plant size and complexity; foreign exchange benefit; and the utilization of raw materials. These criteria must be given considerable thought when the developing countries are selecting industries. The use of any criterion must be related to

the goals which the developing country concerned decides to achieve.

Industries are selected for operation in the developing countries. For this reason, the selection of industrial locations demands great consideration. In selecting industrial locations, the developing countries must consider the factors which generally affect locations. The most significant factors are: transportation, raw materials, markets, labour, and energy. The influence of most of these factors on locational decisions is declining owing to technological advances. Nevertheless, these factors are still in the forefront of all locational decisions, and, as such, they must be considered so that the industries may be located in areas where industrial operation may be economic.

Having selected industrial locations, the developing countries must consider the possibility of providing facilities that normally support industries to operate healthily. Examples of such facilities are: transportation and communication facilities, utilities, industrial parks, housing, community services, etc. These are needed by both the industries and the workmen. Industrialization will, therefore, be benefited by the provision of these facilities.

In conclusion, it may be said that, as far as the developing countries are concerned, problems of industrial location are complex. They are complex in the sense that they involve different sets of problems. Each set must be considered thoroughly if industrial location is to be predetermined within a regional framework.

CHAPTER IV

INDUSTRIAL LOCATION IN THE ACCRA PLAINS (GHANA)

In the preceding chapter an analysis was made of the various industrial location problems, which the developing countries must consider in their endeavour to develop industries. This chapter is intended to demonstrate that predetermined industrial location within a framework of a region, such as the Accra Plains, will assist Ghana to achieve her industrialization goals.

As an integral part of the thesis, and to appreciate more fully the problems involved in this regional approach to industrial location, an analysis will be made, first, of the goals which Ghana has identified in her industrial development policy. Secondly, the settlement pattern in the region will be put into perspective in order to determine the extent to which some of the towns in the region could be suitable locations for industries. Thirdly, the economy of the region will be analyzed to show the extent of the disparity in living standards between the urban and the rural areas, and how far the disparity could be reduced by industrialization of the whole region. Finally, a regional development plan, prepared for the region, will be critically examined to show: first, the degree to which this regional approach has been neglected; secondly, the likely consequence arising from such a neglect; and finally, what must be done to achieve the national industrialization goals.

GHANA'S INDUSTRIALIZATION GOALS

Ghana's goals in industrial development, as they are contained in the various Government documents and in statements issued at press conferences, are: full employment; increase in national income; and maintenance of a strong balance of payments.

Full Employment

Between October 31 and November 12, 1960, about 93,000 persons were registered throughout Ghana as unemployed, including 25,000 women.¹ The proportion of the unemployed to the gainfully employed in the same period was about thirty per cent. "Some 60,000 of these, however, would be better described as under-employed rather than unemployed."² These figures show the degree of unemployment and under-employment in the country. These two phenomena are prevalent in both the urban and the rural areas, thus rendering able-bodied men and women unproductive economically. For these reasons, full employment has become one of the goals which the Government of Ghana hopes to achieve by industrialization. The 'Programme of the Ruling Convention Peoples' Party for Work and Happiness' emphasizes this goal in the following way:

The Party and Government inherited from the Colonial Power large pockets of unemployment in the urban areas and hidden unemployment and an under-employed labour force in the rural areas.

¹Central Bureau of Statistics. Economic Survey, 1960. Accra. The Government Printing Department. 1961, p. 58.

²Ibid., p. 58.

This reflected the agrarian character of the economy, the lack of basic industries as well as overall national economic planning. The Party will change this situation and pursue a policy of positive and conscious abolition of unemployment.³

In presenting a motion to the National Parliament for approval of his Ministry's estimates for the financial year 1962-1963, Mr. Imoru Egala, the Minister of Industries, said, among other things, that his Ministry's industrial scheme was designed both to provide employment for the people in the rural areas and to check the phenomenal migration of the youth of the rural areas to the big towns.⁴

Full employment, then, is one of Ghana's industrialization goals. The employment opportunities needed are for both the urban and the rural areas.

Increase in National Income

Another of Ghana's industrial development goals is "to increase national income and the revenues of the State in order to raise the living standards of the people, and expand and improve the social services".⁵ This is one of the goals which have influenced the state to participate directly in industrialization, rather than to allow foreign and local private entrepreneurs to undertake all industrial

³Quoted from Evening News, February 4, 1963, p. 6.

⁴Egala, I., "Policy on Industries", Ghana Today, Vol. 6, No. 18, November 7, 1962, p. 5.

⁵'Ghana's Economic Policy'. New Ghana, August 1, 1962, p. 9.

development in the country.⁶ The increase in the national income is tied up with the increase in the per capita income of all persons in both urban and rural areas, as enunciated in the 'National Physical Plan': "It is necessary to bridge the deep gap between the first form of cash economy which benefits only a few places, and the poor subsistence economy which prevails everywhere else."⁷

Maintenance of a Strong Balance of Payments

Finally, Ghana looks to industrialization as a means of maintaining a strong balance of payments. Ghana relies quite heavily on a single crop, cocoa, in her export trade. In the financial year 1959-1960, for instance, cocoa occupied about 58.8 per cent of the total value of exports.⁸ As pointed out by Bauer and Paish, referred to in an earlier chapter, the prices of primary products are unstable due to fluctuations in supply and demand of the products,⁹ thus giving rise to balance of payments difficulties to a country, which relies on such products. Industrialization would reduce such overdependence on a single export crop, by helping the country produce other export commodities. On the

⁶Ibid., p. 10.

⁷The Government of Ghana. National Physical Development Plan. Prepared with the assistance of United Nations Regional Planning Mission. Accra. January 2, 1963, p. 1.

⁸Central Bureau of Statistics. op. cit., p. 89.

⁹Paish, S. and Bauer, J. op. cit., p. 750.

import side, it may be noted that food and textiles alone form about 31.4 per cent of the country's imports.¹⁰ Most of these items could be produced at home and thus reduce the excessive pressures on the country's foreign exchange.

In outlining the Government's industrialization programme in Parliament in October, 1962, the Minister of Industries said that Ghana must manufacture within her own borders, as early as possible, all her requirements of food and clothing, since these two items accounted for approximately one-fourth of her total overseas payments at the current rate.¹¹

Maintenance of a strong balance of payments, then, is another of Ghana's goals in industrialization. By strengthening her balance of payments through the production of food and clothing, Ghana may be in a position to import heavy machinery for further industrialization.

Summary

Ghana's main goals in industrialization are: full employment; increase in national income, which takes account of increase in per capita incomes of all people; and maintenance of a strong balance of payments. In order to achieve the last goal, namely, maintenance of a strong

¹⁰Central Bureau of Statistics. op. cit., p. 84.

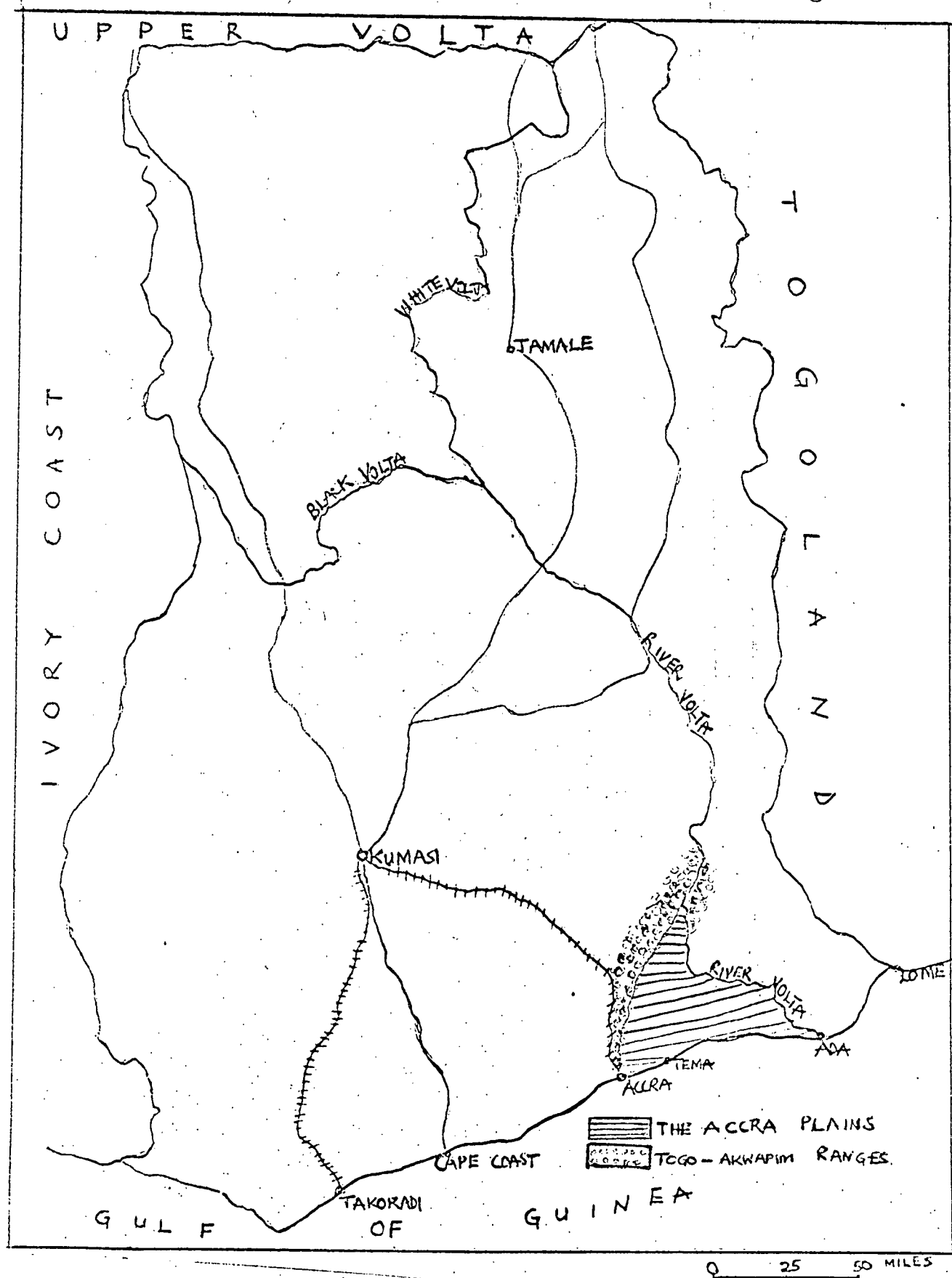
¹¹"Imoru Egala Tells Parliament of Ghana's Industrialization Programme." Ghana Today. Vol. 6, No. 22. January 2, 1963, p. 4.

balance of payments, it may not matter much where the industries are located, if only the factors of location are available or would be provided to make the industries operate economically. But, to achieve the other goals, namely, full employment and increase in the per capita income of all people, both the urban and the rural areas must be considered in the country's industrialization policy. This consideration and thus the achievement of the goals can be made possible only if the region is taken as a framework within which industrial location is predetermined.

SETTLEMENT PATTERN

The Accra Plains lie in the south-eastern corner of Ghana. They form a complete geographic region with a character of its own. Stretching from Accra to Ada along the Guinea Coast, and extending from Ada on the south along the River Volta to Akosombo on the north, the region is hemmed in by the sea on the south, by the lower Akwapim-Togo Ranges in the west and north-west, and by the Volta River on the east and north-east (See Figure II). The region includes two well-distinguished areas: the coastal section and the interior section. The coastal plains, embracing the Volta flood plains to the east, fall gradually from 500 feet at the foot of the Akwapim-Togo Ranges to the sea. The interior plains, on the other hand, are higher, rising to 1,500 feet in elevation. In addition, whereas the coastal plains are marked by a succession of spoon-shaped valleys

Figure II. The Accra Plains in a Regional Setting



separated by low ridges, the interior plains are generally flat and almost featureless.

Size and Location of Settlements

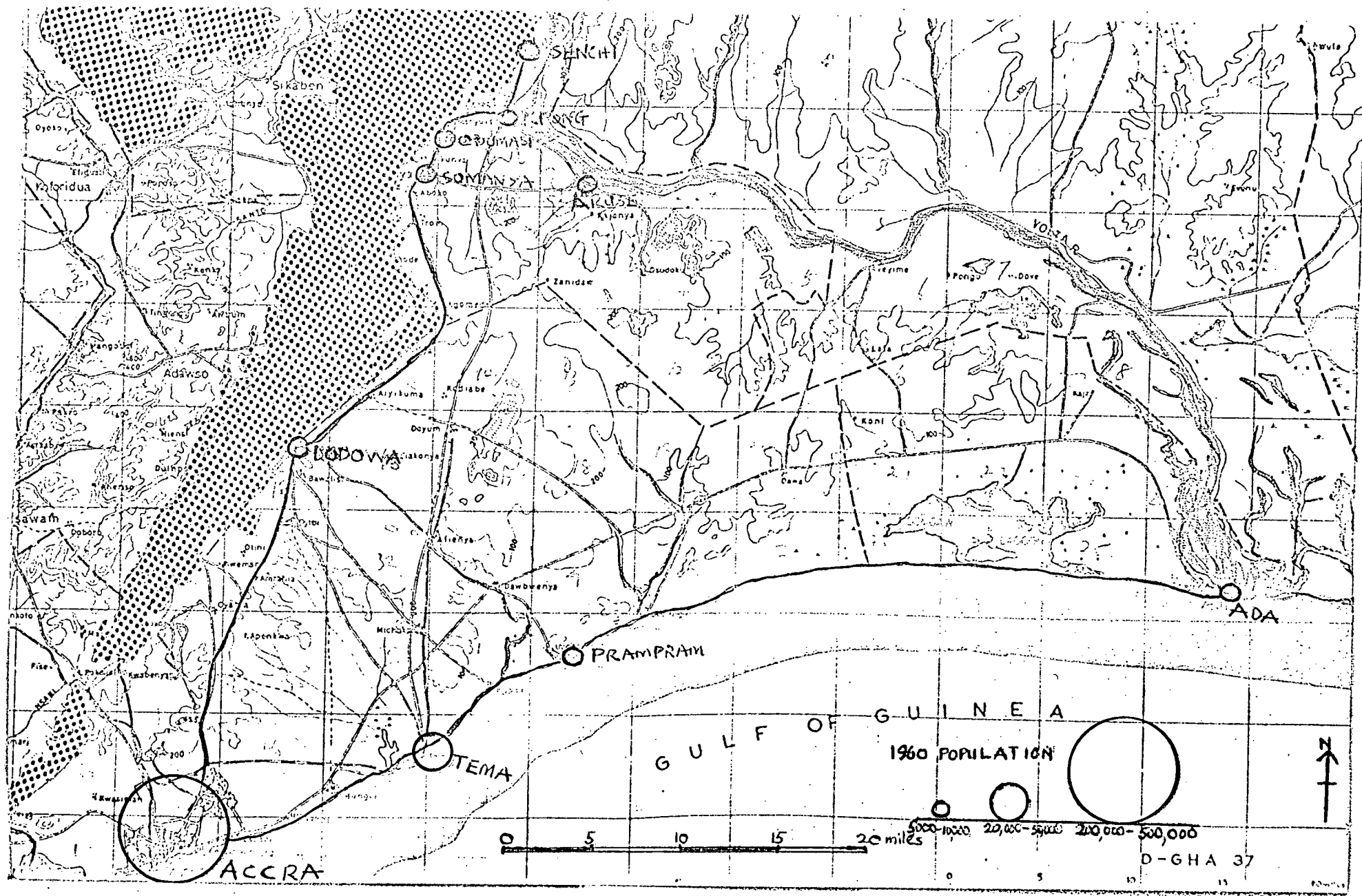
In the region, as many as about 480,000 people are distributed over an area of about 1,100 square miles.¹² The population density of the region is 436 persons per square mile as compared with the overall national population density of 73. The relatively high regional figure is due to the large population concentration in the Accra-Tema metropolitan area. Accra, the largest city in the region, and also the administrative capital of the country, has a population of 350,000.¹³ Tema, lying fifteen miles east of Accra, is the second largest city in the region and has a population of about 35,000. The Accra-Tema metropolitan area alone occupies about eighty per cent of the region's population and has a density of about 3,800 persons per square mile. The other twenty per cent of the population live in towns and villages with less than 10,000 persons.

The general picture of the size and location of the settlements in the region can be seen from Figure III on the next page. In the south-western corner of the region lies Accra, the largest urban centre, on which all the

¹²The population was calculated from the 1960 Ghanaian Census. See "Highlights of Census Report", Ghana Today, Vol. 6, No. 22. January 2, 1963, pp. 6-7.

¹³Ibid., p. 6.

Figure III. Size and Location of Settlements in the Accra Plains



region's transportation routes converge. Situated on the coast, and with a strategic position, Accra began as a small town formed by colonial forts which were built as trading posts in the seventeenth century. In recent times, Accra has grown into a large city mainly along the roads leading from the original nucleus to the hinterland.

Associated with Accra is Tema, which has been developed into a new port and industrial city, taking advantage of its marine location.

The smaller urban centres lie on the two major highways of the region. Along the Accra-Dodowa-Senchi road, at the foot of the Togo hills, are Dodowa, Somanya, Odumasi and Senchi. On the Accra-Ada road are Prampram and Ada. In addition, there are towns on the Volta River, namely, Akuse and Kpong. These are the only settlements with a population of over 5,000. They are strung along transportation routes for the ease of communication. Most of these urban centres are located in the north-western corner of the region where the forest is relatively dense. In this corner the spacing between the urban centres is relatively narrow, ranging from five to fifteen miles, as compared to the spacing between the smaller urban centres along the coast, where it is predominantly grassland.

Apart from the urban centres, the region contains many smaller settlements dotting the plains here and there. As E. A. Boateng points out, the positions of these smaller settlements "are determined mainly by the availability of

water, communications and other special economic advantages, such as situation along the Sea".¹⁴ Consequently, the number of settlements is comparatively large in the 'spring zone' at the foot of the Akwapim-Togo Ranges, along the main roads and along the sea. Elsewhere, settlements usually occur near wells or water holes scattered over the plains, or along pipe lines like that between Accra and Achimota, where regular water supply is assured.

It is difficult to establish any relationship between the size and location of the settlements in the region and the national goals. However, it may be said that the ever-increasing growth of Accra, which has relatively many employment opportunities, is at the expense of the country in general and the region in particular. In 1891, the city's population was 16,262; the population rose to 26,622 in 1901; 29,602 in 1911; 42,803 in 1921; 60,726 in 1931; and 135,926 in 1948.¹⁵ Today, the population is about 350,000. No figures are available to show the growth of the surrounding towns and villages but it can be said that their growth has been relatively slow due to constant migration of people from these towns and villages to Accra for jobs. These phenomena, namely, the ever-increasing growth of the cities and the depopulation of the countryside, have become

¹⁴Boateng, E.A., A Geography of Ghana. Cambridge. The University Press. 1959, p. 145.

¹⁵Ibid., p. 147.

apparent, and the Government has decided to check them by creating employment opportunities in both the urban and the rural areas. Therefore, any industrial location policy which seeks to concentrate industries solely in the cities is contrary to Ghana's industrialization goals of full employment and increase in the per capita income of all persons.

In predetermining the location of industries in the region, consideration of both the size and the location of the various settlements would be quite important. Industries, especially those utilizing a large supply of labour, would require locations with a large pool of labour force. In this case, the larger centres, Accra and Tema, would be in a better position to attract such labour-oriented industries than would the smaller centres, where the labour force is scanty. These latter centres, however, would tend to attract light industries operated on a small scale.

Consideration of the spacing of the towns would also be important in determining whether some of the smaller towns could be turned into industrial centres to which people from the surrounding towns and villages would travel to work. For instance, the concentration of urban centres in the north-western corner of the region would make possible the establishment in one town of medium-sized industries, relying on the labour force in the locality.

Service Centres

Already, there are about a dozen urban centres which serve their various hinterlands. These centres are now mostly market and cultural centres, and their present importance in the region depends upon the functions they perform.

The largest of them, as has been pointed out above, is Accra, upon which most of the region depends for higher education facilities; professional services, such as dentistry, banking and insurance; and recreational and cultural facilities, such as cinemas and libraries. In addition, the city is a large trading market centre, where such things as agricultural equipment and high-quality textiles can be obtained. The farmers in the region also sell their produce here.

The present importance of Accra as a large market centre would make it important as a location for many industries, for they can get an existing market to dispose of their products. In addition, industries would tend to locate here because of the existence of relatively more educated, and hence more trainable, labour force, and also because of the presence of the various professional services which industrialists may need.

Other towns serving limited hinterlands in the region are Dodowa, Odumasi and Somanya. Dodowa, with a population of about 6,000, has a history of being an important

commercial centre, serving the port of Prampram. It was also the seat of the defunct Joint Provincial Council of Chiefs. Today, it is a market centre where the farmers sell their agricultural produce and buy their daily retail needs. In addition, Dodowa is now the seat of the local council of the Shai Native State. In industrial location considerations, this town would be important, since its population could serve as the industrial labour force.

Odumasi, with a population of about 8,000 would also be important in industrial location consideration because of its relatively well-educated labour force. In this town there are four elementary schools, two secondary schools and a teacher training college serving a large part of the region.

Another important town is Somanya, where there is already a considerable business activity, serving the whole of the north-western part of the region. It is linked directly to Akuse, which used to be a very busy commercial centre when the Volta was the most crowded transport artery of the country. With its population of about 10,000, which can be a source of labour and market, and with a relatively less agricultural population, Somanya would attract industries whose operation would be facilitated by the present efficient transportation network, linking the town and the northern and eastern parts of the country.

Summary

The consideration of the settlement pattern in the region, as related to industrial location, has been based on the size and location of the various towns and villages, and the importance of the market centres as potential industrial locations. These are the aspects of the settlement pattern which must be considered so that Ghana may achieve her industrialization goals of full employment and increase in per capita income of all persons in both urban and rural areas. The size of the various centres shows their relative importance as centres of labour supply and market; and the location and spacing between the settlements show the extent to which some towns could be made into industrial centres to which people from the surrounding villages would travel to work.

ECONOMY

Consideration of the economy of the region is important in bringing out the economic activities engaged in by the inhabitants of the region. The activities would suggest where industries must be located to diversify the economy. Also, consideration of the economy would bring out the extent to which the resources in the region can support efficient operation of the industries.

Urban Economic Activities

Figures are not available to show the relative

importance of the various urban economic activities, either by way of employment or by incomes derived from the activities. However, it may be said, as pointed out by Ione Acquah, that trade figures quite largely in the economic activities of the urban centres, such as Accra, Dodowa, Odumasi and Somanya.¹⁶ In the smaller centres, shops are owned by the local people, but in Accra commercial firms are to a large extent owned by foreigners. Petty traders, or hawkers, mostly women, also engage in this activity. Acquah cites 5,890 petty traders in Accra in February, 1955, of whom only 379 were males.¹⁷

Because Accra is the administrative capital of the country, a large labour force is engaged in administrative services of both national and local governments. For instance, in 1952, the national government employed 14,610 persons, and the municipal council, together with the public boards, employed 3,700, including employees of all categories.¹⁸

There are virtually no industries in the urban centres, apart from Accra and Tema. Industries, not necessarily manufacturing, that are in Accra, are predominantly light, and they include: those manufacturing food products, beverages, tobacco, shoes and sandals; building,

¹⁶Acquah, I. Accra Survey, London. University of London Press Ltd. 1958, p. 63.

¹⁷Ibid., p. 63.

¹⁸Ibid., p. 63.

including brick and tiles, carpentry and furniture; laundry and dry cleaning; printing, publishing and allied industries; and motor vehicle repairs, painting and decorating.

Tema, on the other hand, has been planned as a port and industrial city, and, as such, has a relatively large number of existing and potential heavy and light industries. These industries are shown in Tables I and II on the following page. As shown in the tables, some of these industries are owned by the Government and others are owned by private entrepreneurs. This private ownership of industries is an indication that the Government wants to encourage private enterprise in the country. Also shown in the tables are acreages allocated to the various industrial plants in a rational manner so that these plants may not be located haphazardly.

In order that the industries may operate healthily, facilities supporting industrial location, such as transportation, communication, and housing have been provided by the Government. When the potential industries are fully developed, Tema will become a large industrial centre to which people from all over the region would go for employment.

It must be pointed out that this large industrial development in Tema without any regard for the surrounding smaller urban centres and the rural areas, will tend to cause depopulation of these areas. The Government must consider the possibility of setting up industries in the surrounding areas so as to prevent their depopulation.

TABLE I

INDUSTRIES ALREADY ESTABLISHED IN TEMA

<u>Name</u>	<u>Product and Use</u>	<u>Acreage</u>
U.A.C. of Ghana Ltd.	Assembly of Vehicles	10.84
Gaisie (W.A.) Ltd.	Suitcases and Mattresses	
May & Baker Ltd.	Warehouse for Drugs	1.55
I.C.I. (Export) Ltd.	Insecticide	4.1
Ghana Aluminum Products Ltd.	Aluminum Roofing Sheets	2.0
Ghana Pioneer Aluminum Factory Ltd.	Aluminum Utensils, etc.	2.48
Sanco Consolidated Corp.	Metal Works	2.04
Menkoadze Fisheries	Cold Storage and Ice Production	1.60
Tema Stone Quarry Ltd.	Concrete Works	2.78
Parkinson Howard Ltd.	Workshop	4.09
Presby Printing Press	Printing Warehouse	3.97
Ghana Textiles Manufac- turing Co. Ltd.	Textile Manufacture	4.83
Swiss African Trading Co.	Storage	1.40
A. Lang Limited	Builders Yard	3.10
Ghana Plant Hire Ltd.	Hiring of Plant	
Ghana Paints Corporation	Manufacture Paints	2.50
Comet Construction Co.	Furniture Manufacture	7.08

Source: A letter received from the Acting Chief Executive Officer, Tema Corporation, September 29, 1962.

TABLE II

INDUSTRIES IN THE PLANNING OR CONSTRUCTION STAGE

<u>Name</u>	<u>Product and Use</u>	<u>Acreage</u>
Gaisie (W.A.) Ltd.	Mattresses Factory	2.49
Grand Tobacco Corp. Ltd.	Manufacture of Cigarettes	0.90
I.D.C. Industrial Estate	Textile Factory	84.29
Government Printing Dept.	Printing Press	1.14
Addotey Annang & Co.	Storage	13.80
Government Transport Dept.	Transport Depot	11.60
Central Medical Stores	Stores	6.59
Ghaip	Oil Refinery	321.75
Kwame Nkruma Steel Works Corporation	Steel Industry	100.00

Source: A letter received from the Acting Chief Executive Officer, Tema Corporation, September 29, 1962.

Rural Economic Activities

Agriculture, stock raising, and fishing are the main economic activities in the rural areas.

Agriculture

As in most rural areas in Ghana, agriculture in the Accra Plains is, to a large extent, of a subsistence nature, and such tropical food-stuffs as cassava, maize, peppers, tomatoes, okroes, and garden eggs are produced. The surplus over consumption is sold in the larger settlements, which do not engage in agriculture. The farms are rarely over three acres in size, and are grouped around small villages dotting the plains, or strung along motor roads for ease of communication with the buying centres within the region.

Some mechanization has been introduced by the government agricultural agencies, especially in the coastal areas, but, for the most part of the region, agriculture is still in the primitive stage, cutlass and hoe being the main farming implements. Programmes for the mechanization of agriculture are under way and these will tie in with the irrigation projects decided upon by the Government for the region.¹⁹ Mechanization of agriculture would have great impact on the industrialization of the area. It would

¹⁹Doxiadis Associates, Accra-Tema-Akosombo Regional Programme and Plan. Vol. 2. 1960, p. 250.

release part of the agricultural labour force for the benefit of industry. Moreover, mechanization would result in greater output of food to feed the industrial workmen.

Livestock

Livestock breeding or raising is also another rural economic activity in the region. Stock raising is facilitated by three factors in which the region has great advantage. In the first place, the region is free from tsetseflies, which prevent other regions in Ghana from engaging in this activity. Secondly, the pastures, especially those in the eastern section, consisting of short Guinea grass, are suitable for livestock breeding. Thirdly, the Government Veterinary Station at Nungua, lying between Accra and Tema, is a great source of help to the breeders. Since 1934, rinderpest, a dangerous cattle disease, has been eliminated as a result of the activities of the veterinary station.²⁰

Greater increase in output of cattle, arising out of scientific methods, would make possible the establishment of meat-packing and dairying industries in the region.

Fishing

Fishing is even more important than agriculture and stock raising in the region. This activity takes place along the coast, stretching from Accra to Ada, and also in the coastal lagoons and along the lower Volta within the

²⁰Boateng, E.A. op. cit., p. 145.

interior plains. At present, fishing is done predominantly by the traditional canoes. According to the results of a recent census taken by the Fisheries Division, the number of these canoes is about 8,000 for the whole country. They employ a total of 50,000 persons of whom 2,000 are in the Accra-Tema area.²¹ Taking the other fishing centres into account, the employment in fishing may be as high as 3,000.

Plans are under way to convert the traditional canoes into engine-powered craft, whilst, at the same time, the Government would encourage the use of engine-powered canoes of a larger size.²² Fishing in the region would be facilitated also by the recently-opened fishing port at Tema, which, apart from providing berths for a large number of small engine-powered fishing boats, would be the most important port in the country, capable of sheltering large open sea fishing crafts.

The effect which the development of fishing would have upon industry would be considerable. Mechanization of fishing, just like that of agriculture, would result in a greater production of fish which can form the raw materials of canning industries, and also cater to the needs of the industrial workers. In addition, mechanization of fishing

²¹Doxiadis Associates. op. cit., p. 35.

²²For a detailed discussion on the policy of the Fisheries Division relating to fishing in the region, see Ibid., p. 35.

would release part of the labour force presently engaged in this activity for industry.

Both the urban and the rural economic activities in the region offer great opportunities for industrialization of the region as a whole. In the urban areas, many people are unproductively engaged in commerce, which takes the form of petty trading, with its resultant meagre incomes of the traders. Industries would be assisted by utilizing more productively such non-agricultural labour force. In the rural areas, agricultural, livestock, and fishing products can form the raw materials of food-processing, meat packing and canning industries respectively.

Resources

The main resources of the region are human and water. The human resource, that is to say the population, has been considered under the sub-heading 'Settlement Pattern'.

The Volta River, lying to the east of the region, is a great natural resource which will supply the region with electric power. At present, no town in the region, apart from Accra and Tema, is supplied with electricity. Accra-Legon in 1960 had installed power of 16,864 kilowatts and Tema had 1,660 kilowatts.²³ The amount of electric power, considering industrial and domestic uses, is low,

²³Ibid., p. 39.

and thus becomes a serious obstacle to industrialization. Tema will improve its share when the 45,000 kilowatt Thermal power station, now under construction, is completed. The whole region will be supplied with electricity, when the Volta River Project, situated in the northern part of the region, is implemented. This project will supply abundant and cheap power, and thus assist industrial operation in the region. It has been estimated that after the requirements of the aluminum factory to be established in Tema, have been accommodated, there will still be left in the Volta Project a surplus of 120,000 kilowatts of installed capacity, capable of meeting the country's requirements for many years to come.²⁴ Thus, industries established in both urban and rural areas can obtain cheap power.

Summary

The economy of the region has been considered in terms of the region's economic activities and resources. Part of the large labour force employed in petty trading in the urban centres can be productively utilized by industries. In the same way, mechanization of agriculture and fishing can release part of the labour force for the industries, whilst at the same time resulting in increased output, which would serve as raw materials for canning, meat packing, and food-processing industries. Industrial operation would be facilitated by the implementation of the Volta River Project,

²⁴Ibid., p. 40.

intended to supply the whole country in general, and the region in particular, with electric power.

'ACCRA - TEMA - AKOSOMBO REGIONAL PROGRAMME AND PLAN'²⁵

The 'Accra-Tema-Akosombo Regional Programme and Plan' was prepared by a planning consulting firm, the Doxiadis Associates, in August, 1960, for the case study area. The plan is a comprehensive one, dealing with all the development aspects of the region: agriculture, fishing, forestry, livestock raising, energy, industry, communication, etc. Not all these aspects will be examined here, owing to the scope of the study. It is the purpose of this section to analyze the part of the report dealing with industry to help prove the hypothesis that only predetermined industrial location in a regional framework will help Ghana achieve her industrialization goals.

In predetermining industrial location in their regional plan, the planning consultants examined three main problems: first, the degree of industrial development to be achieved within ten to twenty years; secondly, the selection of industries to be developed, and the extent to which each would be developed; and finally, the selection of industrial locations.

²⁵All the discussions on this plan are based on Ibid., pp. 258-266.

Degree of Industrial Development

The degree of industrial development to be achieved within ten to twenty years is difficult to determine, the report points out, because of lack of basic information. However, the existing foreign capital, the industrial projects by the Industrial Development Corporation and the private enterprises, and the 600 factories envisaged in the 'Second Development Plan' (1959-1964) show that the extent of the industrial development of the country would be great.

Relying on the planned 600 factories of varying sizes, the consultants made a forecast of industrial employment and additional national income from the investments. Assuming that each factory would employ between thirty and forty workmen (small-sized factories), additional employment would be from 20,000 to 25,000 in five years' time. In due course, most of the difficulties encountered at the initial stages of industrial development would be overcome, and the rate of increase would be accelerated. Under such circumstances, in ten years' time the additional employment would be as high as 50,000 to 60,000.

The national income would also increase as a result of the establishment of the industries. Assuming the value added by a new worker employed to be 250 pounds sterling (that is one-third of the value added in the case of Britain), then the additional contribution made by industry to the national income would be five to six million pounds in five

years, fifteen to twenty million pounds in ten years, and possibly seventy million pounds in twenty years, 1960 to 1980.

It would not be extremely difficult to achieve all these increases in employment and national income, provided the capital needed to establish the industries could be found, and the industrial workers trained to increase their productivity. Already the 'Second Development Plan (1959-1964)' has been scrapped before its period ended, and a new 'Seven Year Development Plan' has been framed, because the former plan envisaged too many things for which money was not available. This is a problem of implementation of plans, but such a problem is critical in any predetermination of industrial location, since the industries recommended for operation must be feasible economically.

Selection of Industries

The report recommends two different types of industries as feasible for development. These are: first, export industries processing domestic raw materials; and secondly, industries serving the domestic market.

Export Industries Processing Domestic Raw Materials

Export industries utilizing local materials could be economically established in Ghana, provided that the transportation costs of the raw materials from foreign

markets are, for various reasons, higher than the cost of transporting the finished products. In other words, there are some types of industries, the transportation costs of whose imported raw materials are higher than the cost of transporting their finished products. Such industries could be developed as export industries processing domestic raw materials. Examples of these types of industries, cited in the report, are: metallurgical industries; the production of timber and oils; and fruit and fish canning industries.

It has been pointed out in the report that metallurgical industries consume large amounts of fuels and, for that reason, their establishment would necessitate the production of domestic energy. The Volta River Scheme, which is intended to supply the country with electrical energy, would make possible the operation of the metallurgical industries, such as aluminum, whose raw material, bauxite, can be obtained in large quantities in Ghana. The production of timber, the report emphasizes, would not offer great prospects, because the available raw materials would be exhausted in a few years. The successful production of oils, and fruit canning would depend on the corresponding production of the agricultural raw materials. It would not be possible to process cocoa in the interior part of the country due to the unsuitable climatic conditions.

Development of industries utilizing domestic raw materials would help the country achieve two of its indus-

trialization goals, namely, strengthening its balance of payments, and creation of employment. Assuming that imports would remain constant, increase in Ghana's export trade through the development of export industries would result in strengthening her balance of payments. In addition, processing the domestic raw materials in the country, rather than in a foreign country, would create employment for the local people.

Industries Serving Domestic Market

The types of industries recommended in the report to serve the domestic market have greater prospects than the export industries, considering the large imports of manufactured products, such as food and textiles, and also considering the ever-increasing national income.

First, industries intended to serve the domestic market could be those types which utilize imported raw materials whose transportation cost is higher than the transportation cost of the finished products. In this case the total transportation cost would be reduced when production is done domestically. An example of such types of industries is the production of flour in Ghana from imported wheat, because the freight charges on flour are much higher than those on wheat.

Secondly, it would be economic from the viewpoint of transportation costs to process local raw materials domestically to meet Ghana's requirements, only if the

available raw materials are of satisfactory quality and can be supplied at international competitive markets.

Finally, there are some types of industries whose raw material transportation costs are about the same as the transportation costs of their products. In such industries, transportation costs are not a determining factor in the selection of industries, because they form an insignificant part of the total production costs. Such industries could be profitably developed in Ghana, regardless of whether or not the raw materials are available in the country, provided the cost of production would be low. The industries in this category which can operate economically at the initial stage of the country's industrial development are those requiring less skill, and producing comparatively simple commodities, because industrial skill is lacking in the country. Examples of such types of industries, cited in the report, are: manufacture of a large number of metal goods, such as simple tools and household utensils; leather goods, chemicals and textiles.

It is emphasized in the report that the scale of production in many industries would be restricted by the limited size of the domestic market and lack of managerial or organizational skills. For these reasons, certain industries, which require large-scale production in order to achieve a low cost per unit of output, cannot be established in the country. In view of the limited size of the domestic market and the shortage of organizational and enterprising

skills, it is stressed in the report that it would be advisable, in order to achieve a low cost of production, "to concentrate production at a single point in the country which will supply the entire country at a relatively low cost".²⁶ It must be pointed out that industrial production at a single point in the country would not be in the interest of the country since such an industrial concentration would result in the migration of people from all parts of the country to the industrial area for jobs, in which case the national industrialization goals of full employment and higher incomes for all persons in both the urban and the rural areas would not be achieved. What is needed is the spread of industrial production into all parts of the country.

In summary, it may be said that it would be in the interest of the nation to develop industries serving the domestic market, when the industries process both foreign and domestic raw materials, provided that the raw materials are available and at a low transportation cost. The development of such industries would tend to reduce the excessive demand for imported manufactured goods, and thus help the nation achieve one of its industrialization goals, namely, strengthening the balance of payments. Also processing the materials domestically would tend to create employment, which is another nation goal in industrialization. However, it would not be in the interest of the nation to implement the suggestion that production should be concentrated at a

²⁶Ibid., p. 261.

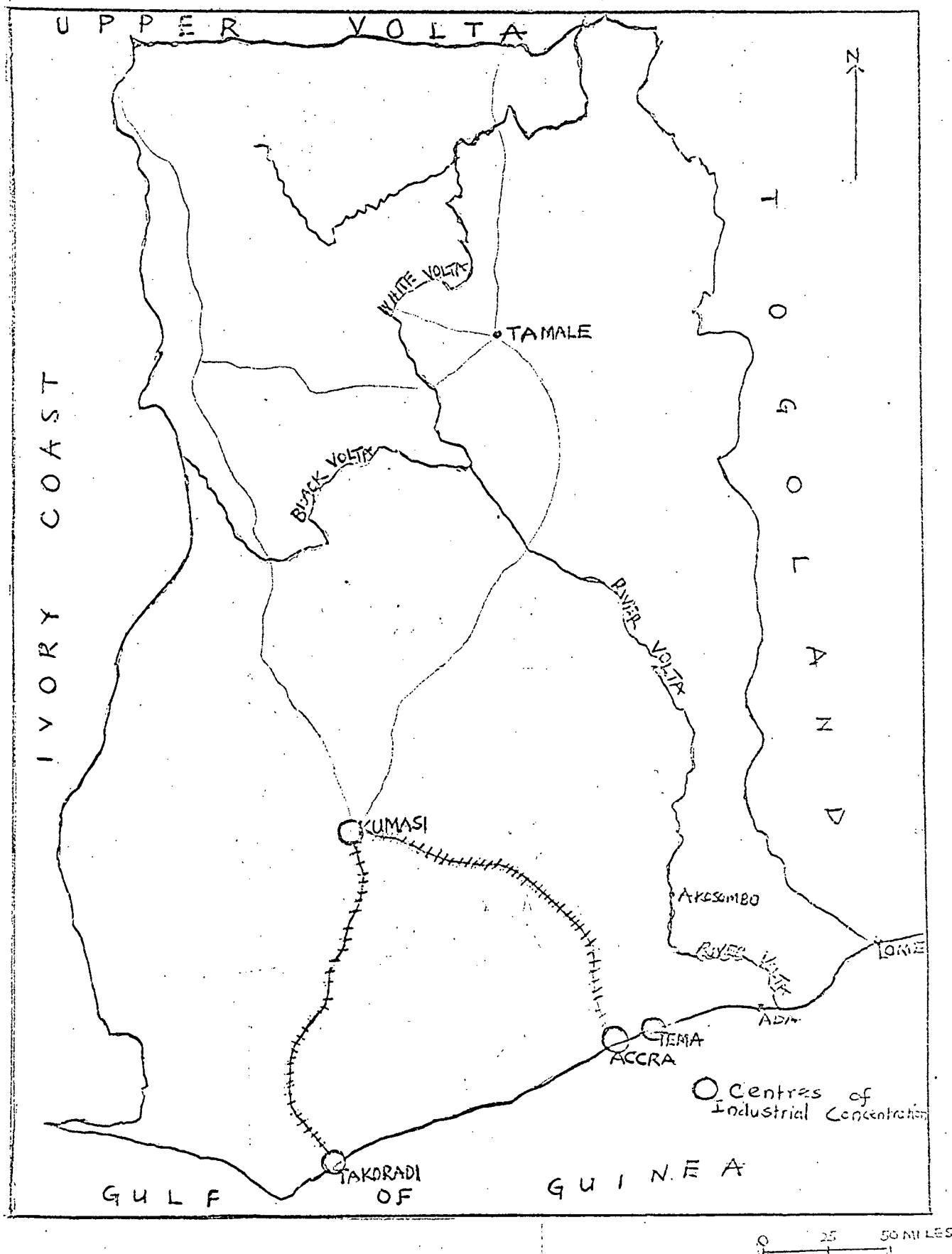
single point because such an industrial concentration would not assist the country to achieve its industrialization goals.

Selection of Location

In considering the possible locations for industries in the region, the planners start by working within the national framework. They point out that it will be in the interest of the nation to concentrate all industrial development in the four principal centres of Ghana, namely, Accra, Tema, Takoradi, and Kumasi (See Figure IV). Tamale, another principal centre, however, does not offer prospects for industrial development at present because of its relatively small population and poor market.

It is emphasized in the report that it would be advantageous economically to concentrate industries in these four centres, rather than distributing them into several areas, because industries need supporting or 'key' facilities, which could be provided more cheaply if few centres were chosen for their locations. Concentration of industries in these four centres possessing the supporting facilities, states the report, would attract private industrialists, since they would gain 'external economies' from such a concentration. Finally, in these centres can be found a large unemployed and under-employed labour-force which can be utilized by the industries. All these reasons, the report emphasizes, show that it is necessary to concentrate

Figure IV. Urban Centres for Industrial Concentration



the industries in the four centres.

It must be pointed out that industrial concentration in only four cities without any regard for the smaller urban centres and the rural areas would result in migration of people from the neighbouring areas to the cities for jobs, and thus in turn result in the over-population of the cities, and depopulation of the rural areas. In addition, the concentration would widen still further the gap between the living standards of the urban and the rural areas. What is needed, as has been pointed out above, is the spread of industry into the smaller urban centres and the rural areas so that the national industrialization goals may be achieved.

The Accra-Tema Area

The greater part of the industries, continues the report, would, however, be concentrated in the Accra-Tema metropolitan area because of special advantages this area has. In the first place, Tema has a deep-sea port, and since most of the industries would process imported raw materials, they would tend to locate close to the port. Secondly, the large population of Accra would serve as a source of labour for the industries, and also as a market for the industrial products. Thirdly, Accra is the country's administrative capital, and private industrialists would like to locate their plants there for easy access to the state services. Fourthly, the greater part of industrial investments under execution or

study by the Industrial Development Corporation, which for a good many years would form a considerable proportion of the country's total industrial investment, are at present concentrated in the Accra-Tema area. Finally, the area has an advantage over Kumasi and Takoradi from the viewpoint of climatic conditions. All these advantages, the report points out, justify the concentration of industries in the Accra-Tema area.

In addition to the above advantages, industrial development in the Accra-Tema area would be facilitated by the provision of efficient transport links with the interior of the country. The 'Volta River Project' would also assist industrial development in the area in two ways: first, the project would supply the area with cheap and abundant electrical energy; and thus attract industries consuming large amounts of power; secondly, the construction of the 200 mile long artificial lake, which is part of the project, would facilitate industrial traffic between the Accra-Tema area and the eastern and northern districts of the country.

All these advantages, the report emphasizes, show that it would be uneconomic to distribute industries throughout the country. Especially, where the raw materials are imported, "one should preclude the establishment of industries either at Kumasi or at any other centre in the interior on account of the higher transportation costs which such establishment would entail".²⁷ In this case, it is recommended

²⁷Ibid., p. 263.

that the selection of location should be limited to Takoradi, another harbour town, and the Accra-Tema area. But, "The economic activity of Takoradi depends today for the most part on the export of timber and ores - that is to say, on activities which.....do not lend themselves to further development"²⁸ and so Takoradi would not be important. The Accra-Tema area, then, becomes the main industrial area capable of supplying industrial products to the entire country and abroad.

As a result of the industrial concentration in the Accra-Tema area it is estimated that at least two-thirds of the increase in the nation's industrial employment would take place here. This means increase in industrial employment of about 15,000 in five years' time, 40,000 in ten years' time, and perhaps 140,000 in twenty years' time. The corresponding estimated increase in industrial income in the area are: between three and four million pounds sterling in five years' time; between ten and twelve million pounds in ten years' time; and about fifty million pounds in twenty years' time.

The Accra-Tema metropolitan area, according to the report, becomes the main point of industrial concentration because of special advantages the area has over the rest of the country. As a result of the heavy industrial concentration, employment and income would increase in the area. The likely consequences of such concentration have been

²⁸Ibid., p. 264.

commented upon in the discussion of industrial concentration in the four cities. Here it may be pointed out that the industrial concentration in the Accra-Tema area would result in increase in population of this area at the expense of the whole country in general, and the surrounding region in particular. Already the population of Accra has been growing at a high rate. In 1948, Accra's population was 135,926; the 1960 census recorded about 350,000, an increase of over 100 per cent within twelve years. Tema, a new town, was established about 1956 and has a present population of 35,000. There is no doubt that these increases in population have been due to migration of people from the whole country, and the region which has great affinities with the Accra-Tema area. This migration would be aggravated by this industrial concentration, and thus check the growth of the rural areas.

Distribution of Industries Between Accra and Tema

The consultants' final enquiry is directed to the distribution of industries between Accra and Tema. Accra is now the administrative capital of the country and Tema is a newly established port and industrial city. But it would be unsound, states the report, to argue that Accra must remain solely an administrative centre, and that all industries must be concentrated in Tema. Such an inflexible policy must not be followed. Accra has a claim to industrial establishments because: first, there are old industries which can form the basis of further development; and secondly,

Accra has a large unemployed and under-employed labour force which could be utilized productively by industry. For these reasons it would be economically and socially necessary to develop industries in Accra. As a consequence of this industrial development in Accra, the city's population would increase, and any proposal to move population from Accra to Tema must be precluded, considering the high costs of social overheads in the new town: "The establishment of industries in places where the population is dense is not in principle a financially disadvantageous policy, particularly when one bears in mind the high social cost involved by the movement of population".²⁹

As regards the distribution of the industries between Tema and Accra, "it is reasonable to establish this discrimination, namely, that Accra will tend to attract light industries, and Tema heavy industries".³⁰ As far as the share of industrial development is concerned, it is assumed by the consultants that industrial development would be equally divided between the two cities, that is, half of it would occur in Accra, and the other half in Tema.

Upon the assumption that Tema would attract heavy industry and that Accra would attract light industries, it is reasonable to assume that industrial income would increase more in Tema than in Accra, considering that industries in

²⁹Ibid., p. 265.

³⁰Ibid., p. 265.

the former city would involve intensive use of capital, and that production per employed person would be higher in Tema than it would be in Accra. Under such circumstances Tema would develop into the main industrial centre of Ghana.

Summary

Three problems of industrial location, namely, the degree of industrial development, the selection of industries for development, and the selection of industrial locations are discussed by the Doxiadis Associates in their development plan prepared for the study area.

The degree of industrial development to be achieved within ten to twenty years in the whole nation would be high, considering the various proposals made by some foreign and local entrepreneurs, the projects of the Industrial Development Corporation, and the already-scrapped 'Second Five Year Plan'. Great increases in employment and income would result from these developments if only the capital needed to establish the industries can be found, and the industrial workers trained.

The types of industries suggested for development in the country include export industries processing domestic raw materials, and industries serving the domestic market. These types of industries would help Ghana achieve her industrialization goals, namely, creation of employment and maintenance of a strong balance of payments.

Four principal centres, namely, Accra, Tema, Takoradi and Kumasi, are recommended as points of industrial concentration in Ghana. However, it is further recommended that since the Accra-Tema area has many advantages over the rest of the centres, the Accra-Tema area must concentrate about two-thirds of the country's industrial development: whereas Accra would be a centre for light industries, Tema would attract heavy industries. Under such circumstances Tema would be the main industrial centre of Ghana, where increase in industrial employment and income would be highest.

CONCLUSION

Industrial location in the Accra Plains has been considered by examining: Ghana's industrialization goals, which should guide industrialization in this region; the settlement pattern, the economy of the region; and part of a development plan prepared for the region.

Ghana's industrialization goals have been identified as: full employment for all people in both the urban and the rural areas; increase in the national income and the per capita income of all persons; and maintenance of a strong balance of payments. Apart from the last-mentioned goal, namely, maintenance of a strong balance of payments, all the goals require that both the urban and the rural areas must be considered in every industrial location decision.

The settlement pattern, that is to say, the size, location, and the sphere of influence of the market centres,

together with the region's economy and resources show that industries can be established not only in Accra and Tema, but also in some of the smaller centres, such as Dodowa, Somanya and Odumasi. The unemployed people and part of the under-employed labour force engaged in petty trading in the urban areas, can be productively utilized by the industries. In the rural areas, greater application of scientific methods in agriculture, fishing and livestock breeding would increase output and thus provide raw materials for food-processing, fish-canning, and meat-packing industries. Mechanization of the rural economic activities can also release part of the rural labour force for the industries. In addition, industrialization in both the urban and the rural areas in the region would be facilitated by the completion of the Volta River Project, which would supply the region with electric power. These urban and rural potentialities must be considered together in all industrial location decisions.

These urban and rural potentialities were not considered seriously by the Doxiadis Associates in their development plan prepared for this region. Working within the national framework, the planning consultants suggested that it would be in Ghana's interest if four principal centres in the whole country, namely, Accra, Tema, Takoradi, and Kumasi were taken as points of industrial concentration, considering that industries need supporting facilities, which are now available in these centres, but are lacking

in the rest of the country. However, the consultants further stated that because the Accra-Tema area has many advantages, such as port facilities, potential electric power, and large population, at least two-thirds of the nation's industrial development would tend to concentrate in this area.

It must be pointed out that only four centres in the country were selected for industrial concentration with complete disregard for the rest of the country because industrial location was predetermined within the national framework. If the suggestions made by the consultants are implemented, the results would be the growth of these four centres, and the Accra-Tema area in particular, at the expense of the whole country. The other urban centres and the rural areas would be depopulated and the present gap between the living standards in these centres and the living standards in the rural areas would widen. Under such circumstances, the development of the rest of the country, especially the rural areas, would be checked.

In view of all this, it may be concluded that Ghana's industrialization goals would be achieved if regions, such as the Accra Plains, rather than the whole nation, or a locality, were taken as a framework within which industrial location should be predetermined. The use of this regional approach would help the nation appreciate the potentialities of both the urban and the rural areas. For instance, the urban areas with their relatively large populations can provide industrial labour and market

for the industries. The rural areas, on the other hand, through their economic activities, such as agriculture, fishing and livestock breeding, can provide raw materials, which can be processed by industries, and thus create employment and income in the rural areas. The supporting facilities, lacking in the rural areas, can be provided by the State. The provision of these facilities can assist the operation of the industries and also raise the standard of living of the people.

CHAPTER V

AN EVALUATION OF THE REGIONAL APPROACH TO INDUSTRIAL LOCATION IN THE DEVELOPING COUNTRIES

This concluding chapter serves a three-fold purpose. A review and summary of what has been said previously concerning industrial location in the developing countries is presented. This is followed by an evaluation of the regional approach to industrial location proposed for these countries. Finally, some recommendations are made in relation to the developing countries in order to make this proposed regional approach a reality.

SUMMARY

The major purpose of this study was to investigate an approach which the developing countries must use in order to achieve their industrialization goals. With this purpose in mind, it was contended that the developing countries will only achieve their industrialization goals if industrial location is predetermined within a regional framework. The investigation was made because industrial location, like the financing of industry, was felt to be one of the basic problems of the industrialization process. The problem arises from the fact that there is great temptation for the developing countries to select only a few cities as points of industrial concentration with complete disregard for the smaller towns and the rural areas, in which case their

national industrialization goals, namely, full employment of all persons in both the urban and rural areas, increase in per capita income, and earning or saving foreign exchange, would not have the maximum opportunity for achievement.

In order to attack this problem of developing a regional approach to industrial location in the developing countries, it was necessary to review some basic concepts involved in this approach. These preliminary considerations were made in Chapter I. It was found that the developing countries are those countries which have quite recently embarked upon economic development in order to achieve such goals as full employment, increase in incomes, raising of the standards of social amenities and facilities. It was noted that the role of industrialization was important in achieving some of these national goals, and for that reason, great importance is attached to industrialization as a means of economic development.

The role of the State in industrial development was found to be critical because the developing countries realize that their socio-economic problems are prevalent, not because resources are lacking for economic development, but because they are inefficiently utilized. Only rational economic planning would stop this inefficient utilization of the resources and thus assist in the development of the countries; this economic planning is the responsibility of the State. In implementing this responsibility of economic planning, the State participates directly in industrial

development, either by providing the supporting facilities for the private industrial operations or, as in most cases, by providing the supporting facilities and developing industries through its agencies alongside the private entrepreneurs. Whatever method is taken for industrial development, the influence of the State is felt in industrialization since its economic plan embraces all aspects of economic development.

In the process of industrialization, the developing countries were found to encounter many problems. Among these is the problem of industrial location, which is the specific subject for discussion in this study. The works of two industrial location theorists, namely, August Losch and Edgar Hoover, were examined to determine methods for analysis of this problem. These theorists explain the costs and benefits involved in choosing one geographic area instead of another as a location for industry. In addition to the works of these two theorists, a regional approach to industrial selection offered by Walter Isard and his co-authors was also examined. The importance of the concept of pre-determined industrial location within a regional framework demanded a review, in Chapter II, of the concept and its application in one developing country, namely, Puerto Rico.

All of these preliminary considerations provided the basis for an appreciation of the problems of industrial location in the developing countries. These problems, namely, selection of industries, selection of locations, and the provision of supporting facilities, were presented in Chapter

III. In order to examine the problems of industrial location, it was necessary to identify specifically the goals which most developing countries have in their industrial development policies. The goals identified were: increase in income per capita; earning or saving foreign exchange; and full employment. The identification of the goals was found to be important because these goals determine the most rational selection of the types of industries and their locations.

For the selection of the types of industries to be established in the developing countries, various criteria suggested by several development economists were analyzed. These criteria are: factor intensity; plant size and complexity; foreign exchange benefits; and utilization of raw materials. It was found that the factor intensity criterion places emphasis on labour-intensive or capital-intensive industries. One school of thought advocates that the labour-intensive industries should be established in the developing countries because labour is abundant and cheap, relative to capital in these countries. Another school advocates that the capital-intensive industries should be selected because they are more productive and efficient. It was pointed out that industries should not be selected because they are labour-intensive or capital-intensive but that every potential project must be evaluated to determine its total advantage to the economy. The plant size criterion attaches great importance to small-scale industries which do not demand

high skills because such skills are lacking in the developing countries. The foreign exchange benefit criterion advocates import substituting industries, especially the types of industries which utilize domestic raw materials. It was concluded that the selection of any of these criteria would depend upon the goals which the developing country concerned wants to achieve.

In order to select locations for industries, it was found that the developing countries must consider such factors as transportation, source of raw materials, market, labour, and energy, which have quite significantly influenced the locational decisions of private entrepreneurs in the more industrialized countries. These factors have been considered most important by the industrial location theorists and have appeared most often in empirical studies. These factors will also affect the locational decisions of the developing countries and, for that reason, they must be given considerable thought. Nevertheless, the developing countries must note that the relative importance of the locational factors is changing. For instance, the importance of the source of raw materials as a locational factor is declining because of substitutes, a longer chain of processing between raw materials and the final products. On the other hand, the importance of market has increased owing to the change in the character of industry as a whole, and the present necessity of speedy and regular delivery of goods. The source of energy has also declined in importance

as a locational factor, due to technological improvements in the transmission of electricity. Labour is also declining in importance because of increasing mechanization. Although most of these factors of location are changing in importance, yet they will continue to affect locational decisions and so the developing countries must consider them carefully when selecting industrial locations.

Finally, since industries require certain supporting facilities and services for their efficient operation, the provision of these facilities and services was considered as a problem of industrial location. These supporting facilities and services are: transportation and communications, utilities, industrial parks, housing, industrial education and training, commercial facilities, and other community services, such as schools and hospitals. Some of these are needed for the actual manufacturing process, others for the manufacturing employees, and some for both the process and the employees. It was necessary to consider these supporting facilities and services in some detail, because they are either lacking or less developed in these countries.

It was concluded in Chapter III that the problems of industrial location in the developing countries are complex and inter-related in nature and, for that reason, they must be carefully examined if industrial location is to be predetermined within a regional framework in order to help these countries to achieve their industrialization

goals. The consideration of these problems provided an opportunity for the demonstration of the application of the regional approach to industrial location proposed for the developing countries. This demonstration was the subject of Chapter IV.

The Accra Plains in Ghana were taken as a case study area. Ghana's industrialization goals were identified as: full employment of all persons in both the urban and the rural areas; increase in national income which takes account of incomes of all individuals; and maintenance of a strong balance of payments. These industrialization goals must decide the selection of industrial projects and their locations in the country.

The settlement pattern, the economy and the resources of the region were examined and these indicated that industries could be established in the larger urban centres and some of the smaller towns to create employment and income for the people, and also to reduce importation of manufactured goods. This regional approach to industrial location was found to be helpful in appreciating the various potentialities of both the urban and the rural areas for participating in industrialization, either in terms of sites for the industries as markets, or as sources of raw materials.

The appreciation of the potentialities of both the urban and the rural areas was not possible in the Doxiadis Associates' plan prepared for this region because the consultants predetermined industrial location within the national

framework. Their selection of only four urban centres in Ghana, namely Accra, Tema, Takoradi, and Kumasi, as points of industrial concentration, and their recommendation that two-thirds of the country's industrial development should take place in the Accra-Tema area, were criticized for tending to widen still further the present gap between the living conditions of the people in these urban areas and those of the people in smaller towns and the rural areas, in which case the country's industrialization goals would not be achieved. It was concluded that Ghana's industrialization goals would be achieved if regions, such as the Accra Plains, were taken as a framework within which industrial location could be predetermined. This regional approach to industrial location will assist those responsible for the national industrial development policy to examine the resources of both the urban and the rural areas, and to utilize these resources to create employment and income for all the people and thus raise their living standards.

EVALUATION

In locating industries to yield full employment, increase in the per capita income, and a strong balance of payments, the developing countries have three alternative frames of reference within which they can predetermine industrial location. The framework selected may be at the national, regional, or local level.

The national framework for predetermining industrial location has been examined and shown in the case study to be unsatisfactory in achieving the goals which the developing countries have identified in their industrial development policies, since the national approach tends to overlook the smaller towns and the rural areas. In this case, any increase in employment and income takes place in the larger urban centres. People in the smaller urban centres and the rural areas could move to these large urban centres for jobs but this migration would be undesirable for the general development of the countries because of the likely depopulation of the areas whence the people would migrate, and also because of the likely over-population of the few industrial centres. For all these reasons the national approach which tends to consider only the larger urban areas will not permit the developing countries to achieve their industrialization goals.

Another alternative is predetermining industrial location within a local framework. By 'local framework' is meant that each city, town, or village is regarded as a separate entity in the industrialization policies of the developing countries. The use of this local approach would be very difficult, considering the administrative problems likely to arise from the great numbers of the cities, towns, and villages in any developing country. These potential administrative problems could stifle all attempts to develop industries in most of the settlements. Moreover, the use of

the local approach would cause the larger urban centres to attract almost all the industries established by the private entrepreneurs, because of their large urban markets, large labour supply, and also because of personal preference for city life, all of which could influence the locational decisions of the private entrepreneurs, with their consequent disregard for the smaller towns and villages. The State may consider all the settlements while developing its industrial projects, but there is the tendency for the State itself to be influenced by the competitive position of the larger urban centres which can provide some supporting facilities and services at their own cost in order to attract industries. For all these reasons, it can be said that the smaller towns and villages are unlikely to gain when industrial location is predetermined within the local framework. In this case, the industrialization goals of these countries will not be achieved.

Both the national and the local approaches to industrial location have been found to be unsuitable for the developing countries in achieving their industrialization goals, namely full employment, increase in incomes of all persons, and earning or saving foreign exchange, because these two approaches tend to disregard the smaller towns and the rural areas which also need more employment and income. The third alternative is predetermining industrial location within a regional framework.

Applicability of the Regional Approach

At this stage, it is necessary to review some assumptions made during the previous discussions of the regional approach to industrial location in the developing countries, and also some findings from the case study before arriving at conclusions on the applicability of the regional approach.

In the first place, it must be pointed out that the earlier discussions on the regional approach were based upon the assumption that the region, within which industrial location must be predetermined for the developing countries to achieve their industrialization goals, is defined as a geographic unit containing urban and rural areas united together by social and economic ties. All the various parts of the region may not necessarily perform the same functions, for whereas the urban centres may perform commercial, industrial, cultural and recreational functions, the rural areas may be engaged in agriculture and other primary activities. What is important, however, is that the various areas are knit together through exchange of goods and services, and that there is a focal point, a city which, by reason of its accessibility from all the parts of the region, ties the whole region together, and also serves as a market for both raw materials and manufactured products. Such a region taken as a framework for predetermining industrial location will help the developing countries to examine closely the

resources of the region, the suitable types of industries and their locations in order to create employment and income for all the people. The fact that the region contains both urban and rural areas is very important since full employment and higher incomes, identified by the developing countries as industrialization goals, are meant for people in both the urban and the rural areas. In this sense, a metropolitan region taken as a framework for predetermining industrial location will not permit the developing countries to achieve their industrialization goals, since a metropolitan region, by definition, is an urban system which does not take into account the rural areas. Thus, a metropolitan region taken as a framework for predetermining industrial location will limit the validity of the hypothesis.

It was found in the course of the study that, whereas the achievement of full employment and increase in the per capita income would demand a regional framework for predetermining industrial location in the developing countries, the achievement of the third national industrialization goal, namely, earning or saving foreign exchange, does not necessarily demand a regional framework. Foreign exchange is an aspect of international trade and, for that reason, it is nations rather than regions which are basic units for consideration. In this sense, it does not matter whether the framework is national, regional, or local, provided industries are selected and economically developed to reduce imports or to increase exports of manufactured goods. This fact also limits the

validity of the hypothesis that ONLY predetermined industrial location within a regional framework will help the developing countries to achieve their industrialization goals for one of the goals may be achieved within the national or local framework.

The case study area was found to possess such industrial location factors as market, labour, raw materials, potential energy, and efficient transportation network. In this case, the region must be used as a framework for predetermining industrial location to yield full employment and higher incomes. On the other hand, where the region lacks most of these factors of location, it would be uneconomic to take such a region as a separate entity for predetermining industrial location. Lack of these factors may also tend to limit the general applicability of the regional approach.

CONCLUSION

In conclusion, it may be said that the regional approach to industrial location will assist the developing countries to achieve their industrialization goals by enabling them to examine closely the resources of both the urban and the rural areas and to utilize these resources to create employment and income for the people. However, the general applicability of the approach is limited by the fact that not all kinds of regions can be helpful as frameworks for industrial location, and also by the fact that not all the

goals necessarily demand a regional framework for their achievement. Also, it must be emphasized that the three levels are not mutually exclusive, and that although the regional approach is valid, the approach must be integrated with national industrialization goals and local conditions of labour and resources supply.

RECOMMENDATIONS

For the regional approach to industrial location to be effected in the developing countries, there will be a need for administrative policies, for special devices necessary to influence the location of industries, and for studies in regionalism.

Administrative Policies

The present administrative regions in the developing countries may not be suitable as regions within which industrial location can be predetermined properly in order to achieve the national industrialization goals. For this reason, there will be a need for identification of regions for industrial development. It is recommended that each region should contain both urban and rural areas united together by socio-economic criteria.

In addition to the delimitation of industrial regions, an autonomous body, that is, a statutory agency, in the form of either a board or a commission, must be established in each region. The agency must be an autonomous

body rather than a branch of the Central Government so that it may be removed from the Civil Service 'red tape' and thus ensure an authority, independence, and efficiency. The agency must be given sufficient finance and powers which it can use to obtain compliance with its policies and programmes.

Special Devices to Influence Industrial Location

It is recommended that special devices be used to influence the location of industries in each region. Six devices have been suggested by Charles Abrams. Any one or a combination of these devices should be examined and used by the developing countries:

1. Persuasion - i.e. influencing enterprises to settle in a particular locality through reasoning, altruism, or by an appeal to public spirit and its gratifications.
2. Inducement - i.e. offering loans, subsidies, housing, land, and other public aid or indulgences.
3. Compulsion - i.e. prescribing through zoning or directive orders the places where settlement is permitted and where forbidden.
4. Direct operations - i.e. purchase of sites with public funds, building of factories or other installations by government agencies for public or private operation.
5. Public - private joint ventures in which government investment is made in private operations, in return for which the public partner insists upon prescribing the conditions for industrial settlement as part of the bargain.

6. 'Planned inevitability' - i.e. the placement of public, transportation or other facilities and investments in so tempting a manner that it inevitably steers the industrial move toward the desired locality.¹

Studies in Regionalism

Various kinds of studies will be needed in order to make the regional approach a reality. In the first place, studies must be undertaken to determine regions for the purpose of industrial development. Secondly, there must be a detailed study of the resources, transportation system, settlement pattern, economic base, employment characteristics, economic trends and rates of growth, and the development programmes of all the regions in the developing countries.

Finally, there must be a systematic process of mapping and of the analysis of potential industrial locations of each region. Continuous study and up-dating of the research information would also be necessary. The result of these studies would be a better appreciation of the regional approach to industrial location, which will assist the developing countries to achieve their industrialization goals.

¹Abrams, C. "Regional Planning Legislation in Under-Developed Areas". Regional Planning - Housing, Building and Planning, Nos. 12 and 13. New York. United Nations. 1959, p. 99.

APPENDIX I

The following list represents Conway's 700 Plant Location Factors, which are divided into ten major headings. Each of these major headings has many sub-headings, as shown. Under each of these sub-headings there is a list of sub-subheads, which are not included in this appendix.

PLANT LOCATION FACTORS

1. Markets

- Market Trends
- Retail Sales
- Income
- Competition
- Industrial Markets
- Regional Comparisons
- Areas
- Consumer Characteristics
- Population

2. Labour

- Commuting Factors
- Employee Performance in Area
- Relocation
- Testing Techniques
- Labour Legislation
- Union Activity
- Personnel Policies
- Unemployment
- Labour Potential
- Scientific Manpower
- Vocational Training
- Labour Force Inventory
- Labour Surveys or Registration
- Interview Other Employees
- Sources of Data
- Unavailable Personnel

3. Materials and Services

- Major Raw Materials
- Routine Supplies
- General Services
- Technical Services

4. Transportation

- Location Economies
- Rail Transportation--General
- Rail Service at Each Site
- Motor Transportation
- Water Transportation
- Commercial Air Service
- Private Aircraft Facilities
- Mail, Parcel Post, and Express
- Communications
- Special Services

5. Government and Legislation

- Government Administration in Area
- State Legislation
- State Taxes
- Local Taxes
- Total Tax Bill
- Future Taxes
- Industrial Dispersal

6. Financing

- Analyze Requirements
- Sources of Funds
- Credit Standing
- Terms of Loans
- Special Inducements

7. Water and Waste Disposal

- Basic Water Sources
- Municipal Water Systems
- Ground Water--Wells
- Surface Water--Streams and Lakes
- Chemical Analysis
- Drainage
- Stream Pollution--Waste Disposal
- Sewage Disposal Systems
- Garbage and Trash Disposal

8. Power and Fuel

- Select Basic Energy Source
- Check each Utility or Supplier
- Electric Power
- Coal, Oil, Fossil Fuels
- Gas

9. Community Characteristics

- Overall Community Planning
- Planning and Zoning
- Industrial Zoning
- Air Pollution
- Weather--General
- Weather--Specific Check-points
- Housing
- Civic Organizations
- Political Atmosphere
- Law Enforcement
- Social Attitudes
- Business Meeting Facilities
- Health and Medical Programmes
- Schools
- Churches
- Cultural and Recreational Facilities
- Spectator Sports
- News Media
- Representation in Congress
- Streets
- Fire Protection
- Amenities and Intangibles
- Existing Industries

10. Individual Sites

- General Requirements
- Types of Sites
- Intangible Considerations
- Survey Methods
- Legal Check-Points
- Maps
- Soil Characteristics for Foundation
- Cost of Land

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