CHAPTER-I

PROLOGUE

PERSPECTIVE AND EXPLANATION
Desperate rates of growth between and within regions of an economy throw much the same range of problems as desperate rates of growth between developed and underdeveloped countries. Regions which could not fully participate in the mainstream of growth face the problem of regional underdevelopment characterised by unutilisation or under-utilisation of resources.

1.1 REGIONAL DISPARITIES: PLANNING AND BALANCED DEVELOPMENT

Disparities between a few enclaves of affluence and the chronic persistence of underdevelopment over a major part of the globe is a reality. This situation is true even within the developing nations like India. Large part of humanity continues its struggle for survival and against abject poverty, hunger and degradation.

Development has led simultaneously to integration and differentiation with space economy. Development is not operating in a
closed system but at a multi-level and hierarchical system of fields within fields of a system of interdependencies nesting into a large system of interdependence.

Agriculture will continue to provide necessary capital for investments, raw materials to sustain industry and food for the people of developing countries like India. The success of our planning mainly depends upon the development of agriculture and its stability and sustainability, cropping pattern, optimization of cropping pattern and landuse, development of irrigation, gearing up of agriculture to higher levels of efficiency, increase in the application of inputs, spread of green revolution etc. Development of agriculture is very crucial to alleviate poverty, unemployment and underemployment as well as to improve income levels.

Considerable differences in the levels of socio-economic development arise due to the inequalities in the spatial distribution of natural and human resources, their quality, development and technological level.

Differences in regional development are manifested in the differences of per capita income, employment pattern, living standards, education and social progress.

A misdirected and uncontrolled process of regional economic development is held responsible for "numerous economic, social and cultural inequalities subsequently hard to eliminate, incomplete
utilisation of the country's resources and to a growth of public costs involved in the functioning of its economy" (Winiarski, 1968). Regional disparities, which had their origins in the ill-conceived investment programmes effected under the colonial rule, have further grown to greater dimensions due to lack of attention paid to the micro-level plans. These disparities have been so much accentuated that they have adversely affected the over all performance of the economy.

The regional imbalances and lopsided growth, which are not conducive to economic stability, may well result in under-utilisation or even non-utilisation of natural and human resources.

Reduction of regional disparities does not mean transferring the fruits of prosperity from a developed region to an underdeveloped region desisted from production oriented activities. Such transfers can only bring temporary relief, while the disparities continue to remain unchanged and may even widen. In fact, the idea of balanced regional development is rather a corrective process to even-out the variations in the degree of economic development in different regions of the country.

The attempts so far made in India to achieve regional balance by mere mechanism of distributing new industrial and other projects proved to be futile on account of the wrong assumptions on which such distribution was based. For instance, a high proportion of
investment in basic industries has been made in the tribal areas of Bihar, Madhya Pradesh and Orissa, wherein the level of economic development continues to be very low.

The regional dimensions of disparities in India can be better understood only in the context of the distortions introduced into the regional system under the British rule. The development of metropolitan regions like Bombay, Calcutta, Madras and Delhi can largely be attributed to the historical factors. Even though many positive modifications were introduced in India since independence, the regional structure of under-development created by the British to meet the requirements of its exploitative mechanism still persists in many of its essential characteristics.

1.1.1. Balanced Regional Development

Balanced regional development has been an important policy objective in India since the beginning of the planning era in 1951 and finds a pride of place in the industrial policy resolution of 1956 and the Five Year Plan documents. But like many other objectives in the economic sphere, it has remained a pious declaration chiefly on account of the absence of concrete measures to implement the policy.

While special efforts have to be made by the State Governments to reduce regional imbalances within their own areas, the Central Government must help positively by choosing the location of central projects and the inter-state projects, keeping in view the needs of the backward regions.
The locational factors are relatively rigid in the case of a steel factory or oil refinery, while there are innumerable other industries which are 'foot loose' in the sense that they can be established almost anywhere, provided that the initial infrastructural investments have been made.

In addition, some of the currently backward regions are rich in unutilised forest products or in other types of unexploited natural resources. Such of these regions can as well be developed as new industrial centres for special varieties of goods by developing infrastructural facilities like transport.

1.1.2 The Concept of a Region

A region is a geographic or areal unit having certain characteristics and is hierarchical in nature. In the words Hammond (1985), "a region is said to possess homogeneity, a cohesion either physical, functional or cultural, which finds points within an area together and distinguishes them from points elsewhere". There are various types of regions such as natural, formal, functional and administrative regions.

"From a practical point of view, region is considered as operationally the most convenient and economically the most gainful, spatial, sectoral and or temporal unit for resources allocation, taking planning as merely a process, growth as the economic result and welfare as the ultimate goal" (Gopal, 1976).
Broadly there are four types of regions and hence four tiers of regional plans in a large country like India: (1) macro-regional plan (National Plans), (2) meso-regional plan (State Plans), (3) micro-regional plan (District plans) and (4) local plans.

1.1.3. Regional Planning

Regional planning as a discipline subsumes regional science and concerns itself with the philosophies, approaches, policies, strategies and techniques of sub-national planning. It attempts the overall development of a region within the framework of national goals and objectives and integrates the economic, social and environmental aspects of development. One of the major tasks of regional planning is to attempt a regional integration of sectoral and spatial development processes so that the benefits among various activities and areas could be fruitfully utilised to get maximum returns from resources. It also attempts to understand and use the local and regional resources as well as physical and human resources together with the expertise in the national building task.

Basically, regional planning is a spatial developmental planning which tends to utilise the resources of natural, human and other to the fullest extent so as to distribute the fruits of development among the regions and to minimise the socio-economic imbalances and improve the living conditions of the masses.

"Regional Planning is suggested for the allround socio-economic development of a backward country like India against the
single national level sectoral planning" (Singh, 1982).

However, in the early stages of planning in India, the problems and issues of regional development did not arise as boldly as they do today. In fact, immediate need of the economy in the early stages of its planned development was to concentrate efforts in such sectors and regions that would give maximum returns to investment and would help in solving the pressing problems of the country. Spatial planning, directed at equalising regional development or minimising regional inequalities in economic development, could be attempted only at the macro-level.

During the Third Five Year Plan the regional development policy became more explicit. Regional development as such was treated as a long term goal. However, the Planning Commission prescribed some short and medium term policies which could prepare necessary basis for autonomous development process in the backward regions.

The experiences of most of the developing countries point to the fact that regional disparities do increase unless there is a conscious attempt to incorporate regional balance as one of the major objectives of national planning.

While the experience of past several years in national planning has provided adequate expertise in macro-level economic planning, very little is known about the process of regional planning as a means to reduce inter-regional disparities in the development.
1.1.4. Multi-Level Planning

Poverty in India is more marked among certain sectors of activity, groups of people and regions and localities. To carry the benefits of development to the poor, to ensure the continuity of growth and to provide social justice, multi-level regional approach has to be emphasized and implemented.

The administrative set up and political system of India make it imperative and warrant planning and development processes at different territorial levels.

Despite more than four decades of experience with developmental planning in India, very little constructive attention has been paid to regional aspects of regional development. The comprehensive programmes and policies for regional economic development and distribution of income and development over space have been particularly lacking. Isard and Reiner (1961) stated that "where adequate regional economic development plans and programmes are lacking, the likelihood of success of national economic development programmes is decreased and the overall gains from national investments reduced".

Almost in all the countries, the concern for regional balance has increased and in a large country like India, it has long been accepted as the national policy objective. Despite all the attempts of the Indian planners and policy makers to reduce regional
disparities in successive Five Year Plans, serious inter- and intra-regional disparities have remained or even increased. It has become imperative that corrective measures should be pursued in order to secure a better and more equitable spread of income and social consumption over space as well as over time.

In the context of the need for balanced development of different parts of the country and the extension of the benefits of economic progress to the less developed regions, an intensive study of the levels of development in different parts of the country is essential. Analysis of the inter-state and inter-regional differences in respect of certain socio-economic indicators is necessary for devising appropriate measures for balanced development in successive plan periods. In particular, such a study should help to evolve and clarify principles for building up an effective approach to comprehensive regional planning designed to co-ordinate developmental activities at the national and regional levels.

In view of the growing emphasis on the objective of equalisation and reducing regional disparities in India, the present study is designed. It is recognised that identification of regions according to their differential levels of development, typology and dimensions of backwardness, is crucial for implementing effective regional plans. With this view, the present study is designed to examine the regional disparities in Andhra Pradesh and to indentify differentially developed regions and delineate homogeneous regions in
terms of both levels of development and typology of development so as to identify different groups of regions requiring different plan strategies at micro- as well as at meso-levels.

1.2. LIMITATIONS AND SCOPE OF THE STUDY

In the Indian context, particularly in Andhra Pradesh the districts and mandals are the intermediate level administrative units below the State level which are taken as regions for plan implementation. Hence, mandal and district are taken into consideration as the micro- and meso-level areal units respectively in the present study. Unfortunately availability of data at mandal level is too inadequate. Hence, the district appears to be the most convenient and suitable meso-region where a fully co-ordinated development machinery, viable training and service facilities, a fairly satisfactory data base have been build up over the years.

The entire study has been basically confined to only one point of time i.e., 1984-85. The Government of Andhra Pradesh introduced 1104 mandals in the place of 316 taluks in 1985 and the statistical data is hardly published later. Hence, it is not possible to study the changes in the levels of development at mandal level since they were formed in that year only.

Development is a process of qualitative change and quantitative growth in the context of social and economic development. Because of the close inter-relationship between the economic and social elements, purely social and purely economic development is not
possible. Hence, the study sought to cover all the important socio-economic aspects, which include: (i) agriculture, (ii) industries, (iii) education, (iv) health, (v) power and (vi) transportation and communication. There are some other important sectors like urbanisation, banks, co-operatives etc., which are not taken into consideration in the present study as necessary data is not readily available particularly at micro-level.

1.3. DATA COLLECTION

The required data was collected from the 'Mandala Gananka Darshini' (Mandal Handbook of Statistics) published in regional language (Telugu) by the Government of Andhra Pradesh. At present it is the only source for statistical information at micro-level. At district level the data was collected from the respective departments and institutions at Hyderabad. They are (i) Bureau of Economics and Statistics, (ii) Directorate of Agriculture, (iii) Andhra Pradesh State Electricity Board and iv) the offices of: (a) Commissioner of Industries, (b) Director of Health and Family Welfare, (c) Director of Higher Education and Commissioner of School Education, (d) Chief Engineer, General and Panchayat Raj, (e) Post Master-General and (f) General Manager, Telecommunications.

1.4. SELECTION OF VARIABLES

'Development' is a relative concept. Neither a clear and agreed definition nor a single measure acceptable to all is available. In order to pursue quantitative definition of development one has to
rely on some approximations and indirect measures. The term 'development' has been interpreted differently depending upon the context in which the term is used. The term 'development' implies an improvement in the material well-being of the people. Material well-being of a region can be identified with the increase in the real production, availability of amenities and services, infrastructural facilities, good employment opportunities and so on. Any positive change and growth of socio-economic parameters indicate development.

The most crucial as well as the most difficult task in the construction of general index is the choice of indicators, through which the process of development is articulated both for purposes of identification, classification and regionalisation. As regards the selection of variables many qualifications like accuracy, timely availability, measurability and stability are considered to be pre-requisites. However, many of the variables which may be desirable and very much needed may not be available either on time series basis or to the extent necessary.

In view of the recent changes in the orientation and structure of development planning, a macro-approach to assess the social and economic change has become irrelevant. This is because the macro-indicators operate in terms of national obstructions that are remote from local reality and commonly fail to reveal the distributional aspects of development. "The indicators of development should now stress more on micro rather than macro aspects of
development, distribution rather than averages and concern with individual or the community rather than with the nation or society as an observation" (Sundaram, 1982). It is in this context that the building up of appropriate development indicators at the regional and local levels becomes an important issue.

Per capita income is generally taken as an aggregate measure of development. However, it is evident that development involves much more than mere growth. Per capita income as a measure of development suffers from a number of theoretical weaknesses. Besides, there are innumerable practical problems while calculating income. Income figures at micro-level are very rarely available. Misra (1982) rightly pointed out that "per capita income does not necessarily produce the trickling effect as envisaged earlier and this criterion alone would not be a fairly reliable indicator of development".

In some investigations, differences in productivity or employment or industrialisation is used as a measure of development. However, a big limitation of any of these criteria, when taken individually, is that they do not consider various factors which influence the levels of development of different sectors of a region. Any of the above mentioned criteria is, at best, a partial indicator of development. A comprehensive measure of development should be based on various aspects of development and hence a number of economic and cultural variables must be taken into consideration while constructing an index for the aggregate level of development.
Despite all these practical problems in the selection of variables, one should bear in mind the conceptual differences of diversity and disparity. Chattopadyay and Moonis Raza (1975) explained that the "differences in initial resource endowments largely of a natural or physiographic character, leading to territorial specialisation and division of labour through exploitation of the resource advantages, comparative as well as absolute, constitute the basis and substance of inter-regional diversity, which is concomitant of development. Inter-regional disparity, on the other hand, denotes the failure of a region to exploit the developmental potential of its initial resource endowments, its latent comparative and absolute resource advantages relative to another comparable region and is, therefore, comprised of factors which are not natural or physiographic, but human, instituional and historical-socio-political and or economic technological". Essentially, inter-regional disparity is a consequence of the relative failure of a region to convert the initial resource endowments into economic resources.

In view of the above conceptual differences a great distinction has been made between diversity and disparity for the present study. Thus, the data regarding to landuse, rainfall, mines and other physical aspects have not been mixed with the indicators of development.

It is not difficult to think of a large number of indicators. In fact, the literature on indicators of development
reveals the use of many indicators which may or may not be satisfying the properties of a good indicator. The large number of indicators used for the purpose give an impression that broad spectrum of developmental activities are being taken into consideration but actually a closer look reveals that many of the indicators are mere repetition or are directly related to each other or with some principal characteristics. For instance, a region is largely covered with forest area in which an indicator (number of hospitals), taken in proportion to population and in proportion to area, may not represent the real dimension of development. If the population of an area has been well served with the existing health facilities, there is no need to consider the areal extension of health facilities. Moreover, it may lead to duplication and repetition of the reality.

The present study is limited to one point of time (1984-85) since data is available for 1104 mandals and 23 districts of Andhra Pradesh for that year only. Nearly 100 possible variables were considered; but in view of the limitations in the extent of data availability, finally 27 variables at mandal level and 40 variables at district level were selected which were thought to be relevant. These variables were grouped under agriculture, industry, infrastructure etc.

1.4A. Selected Indicators at District Level

(1) Agriculture

1. Percentage of net irrigated area to gross sown area.
2. Cropping intensity.
3. Irrigation intensity.
4. Percentage of area under H.Y.V. to gross sown area (GSA).
5. Consumption of fertilizers per 1,000 hectares (hec.) of GSA.
6. Number of pumpsets per 1,000 hec. of net irrigated area (NIA).
7. Number of ploughs per 1,000 hec. of net sown area (NSA).
8. Number of tractors per 1,000 hec. of NSA.

(ii) General Industries
1. Number of industrial units per 10,000 population.
2. Industrial investment per 10,000 total population.
3. Industrial workers per 10,000 total population.
4. Percentage of industrial workers to total workers.
5. Per capita power consumption.

(iii) Small Scale Industries
1. Number of industrial units per 10,000 population.
2. Industrial investment per 10,000 population.
3. Industrial workers per 10,000 total population.
4. Percentage of industrial workers to total workers.

(iv) Education
1. Percentage of total literates to total population.
2. Percentage of female literates to female population.
3. Percentage of rural literates to rural population.
4. Number of primary school students per 10,000 population.
5. Number of high school students per 10,000 population.
6. Number of college students per 10,000 population.
7. Number of teachers per 1,000 students.

(v) Health
1. Number of hospitals and dispensaries per 10,000 population.
2. Number of doctors per 10,000 population.
3. Number of beds per 10,000 population.
4. Number of primary health centres (PHC) per 10,000 population.

(vi) Power
1. Percentage of villages electified to total villages.
2. Per capita total power consumption.
3. Per capital domestic power consumption.
4. Number of total connections per 10,000 population.
5. Number of domestic connections per 10,000 population.
6. Percentage of domestic connections to total connections.

(vii) Transport and Communications
1. Total road length per 100 sq. km.
2. Surface road length per 100 sq. km.
3. Ratio of surface road to unsurface road.
4. Number of motor vehicles per 10,000 population.
5. Number of post and telegraph offices per 10,000
6. Number of phones per 10,000 population.

1.4.B. Selected Indicators at Mandal Level

(i) Agriculture

1. Percentage of net irrigated area (NIA) to gross sown area.
2. Cropping intensity.
3. Irrigation intensity.
4. Number of electrical motors per 1,000 hec. of NIA.
5. Number of oil engines per 1,000 hec. of NIA.
6. Number of tractors per 1,000 hec. of net sown area.

(ii) Industries

1. Number of industrial units per 10,000 population.
2. Number of industrial workers per 10,000 population.
3. Percentage of industrial workers to total workers.

(iii) Education

1. Percentage of total literates to total population.
2. Percentage of female literates to female population.
3. Number of primary school students per 10,000 population.
4. Number of high school students per 10,000 population.
5. Number of teachers per 1,000 students.
6. Number of educational institutions per 10,000 population.
(iv) Health

1. Number of hospitals and dispensaries per 10,000 population.
2. Number of doctors per 10,000 population.
3. Number of beds per 10,000 population.

(v) Power

1. Percentage of villages electrified to total villages.
2. Number of total connections per 10,000 population.
3. Number of domestic connections per 10,000 population.
4. Number of pumprosets energised per 1,000 hec. of NIA.

(vi) Transportation and communications

1. Total road length per 100 sq. km.
2. Surface road length per 100 sq. km.
3. Ratio of surface road to unsurface road.
4. Number of post and telegraph offices per 10,000 population.

1.5. METHODOLOGY

A social science researcher should bear in mind two important things viz., i) the selection of indicators and ii) the methodology. Methodology now forms a basic tool in the kit of techniques available to the geographers. Factorial analysis, probably the most widely used techniques in human geography during the last three decades, was introduced by B.J.L. Berry and his colleagues in a variety of geographic situations. Among the multivariate techniques, principal component analysis and factor analysis are the most
acceptable techniques for the studies like the present one. The two related techniques have become extremely popular as geographical research tools since 1960. The basic difference between the two are as follows. Component analysis assumes that all the variation in a given population is contained within the variables used to define that population, whereas factor analysis assumes that only part of the variation in a given population is contained within the variables used to define that population. These two assumptions lead to a much more deterministic approach if principal component analysis is used, and to a much more flexible experimental approach if factor analysis is used. It indicates that major difference lies in the clarity with which inter-relationships can be indentified. In veiw of these advantages factor analysis is employed in the present study.

Rummel (1967) explained the depth of factor analysis in the social science research. He stated that "factor analysis and the complementary multiple regression model are initiating a scientific revolution in the social sciences as profound and far reaching as that developed by the calculus in physics". Though this may be an overstatement of the important claims of the methodology, it nevertheless underlines the general importance of the technique beyond the immediate confines of the geographic discipline.

1.5.1. Factor Analysis

Consider data on k-variables recorded at 'n' different regions. The data on each variable can be viewed as a point in n-
dimentional space. Thus, in this situation one has k-points in n-dimentional space. It is quite likely true that some of these variables may be closely constituted. The k-points which belong to 'n' dimentional space may also be viewed as vectors and hence angles exist between these vectors. These angles explain the degree of association between the variables. A zero angle between two vectors indicate perfect positive association, a \(90^\circ\) angle implies orthogonality and hence no relation, a \(180^\circ\) angle indicated perfect negative relation between vector representations of the variables. The Cosines of these angle are given in the form of simple correlation matrix. The Factor Analysis attempts to find all the underlying dimensions which exist in the data matrix. The first step would be to discern the dimension that explains that largest amount of variation, which is called a 'factor'. The factor is a mathematical artifact and it has to be interpreted with respect to the original variables. The degree of representation of a factor, to different variables can be estimated from the correlation coefficients between the factors and different variables. Such correlation co-efficients are called 'Factor Loadings'. The squares of these factor loadings indicate the proportion of variation in the variables captured by the factor. The sum of the squares of factor loadings is used to determine the proportion of total variation summarized by the factor.

The first step in Factor analysis model is the calculation of a correlation coefficient matrix.
Let the correlation matrix be

\[ R = \begin{pmatrix} r_{ij} \end{pmatrix} \quad r_{ij} = 1 \text{ if } i = j \]

\[ \text{Compute } S_i = \sum_{j=1}^{k} r_{ij}, \quad i = 1, 2, \ldots, k \]

Total variation in the data is taken to be the sum of the diagonal elements of R, i.e., k. Closer the positive correlation coefficients to unity closer the sum of them to the total variation.

\( S_i \) values measure the degree of association between variables and the first factor. We standardise \( S_i \) values, so that the resultant values lie between -1 and 1.

Thus,

\[ a_i = \frac{S_i}{\sqrt{T}}, \quad i = 1, 2, \ldots, k \]

where \( T = \sum_{i=1}^{k} S_i \)

\( a_i, \quad i = 1, 2, \ldots, k \), are called factor loadings, in particular, \( a_1 \), is called loading of factor \( i \). Also \( a_i \) are interpreted as correlation coefficients between the first factor and \( i^{th} \) variable.

We compute,

\[ \sum_{i=1}^{k} a_i^2, \text{ which is called 'eigen value'} \]
for the first factor.

\[ \sum_{i=1}^{k} a_i^2 \]

estimates the extent of variation in data matrix, explained by the first factor.

Note that, \[ 0 \leq \frac{\sum a_i^2}{k} \leq 1 \]

Thus the unexplained variation in data matrix is estimated by,

\[ 1 - \frac{\sum a_i^2}{k} \]

This unexplained variation determines a second factor.

The residual correlation matrix pertaining to the variables after variation described by the first factor is extracted.

the residual co-efficient matrix may be obtained as follows:

1) Let the factor loading vector be denoted by 'A' which is of order \( k \times 1 \). Denote \( AA^T = Q \), where \( Q \) is a \( k \times k \) matrix.

2) Substruct the elements of 'Q' from the corresponding elements of 'R' to obtain the residual co-efficient matrix.
iii) Formulating a $k \times k$ matrix, fill the cells with the sign of the elements of the residual matrix, count the negative signs under each column of the matrix.

iv) Select the column corresponding which the number of negative signs is maximum and $\geq 3$. Leaving the sign of diagonal element unchanged, convert all negative signs of the row and column of this element into positive signs.

v) Repeat the above step until the number of negative signs in each column is $< 3$. Allot these signs to the first factor residual matrix. The resultant residual matrix is called 'The Reflected Residual Matrix.'

vi) Repeat the procedure adopted to compute first factor to obtain the second factor.

Analogously, the remaining factors may be computed. The maximum number of factors that can be obtained are $\leq k$.

Usually, the procedure of finding factors is terminated when the amount of variation not explained by the factor is less than 5%.

1.6. PLAN AND DESIGN OF THE THESIS

This study has been carried out with an objective to identify and classify the regions according to the sectoral as well as aggregate levels of development. To accomplish this objective the thesis is planned and organised as given hereunder:
Chapter-I deals with the conceptual aspects of regional disparities, regionalisation and planning so as to provide the basic understanding of regional imbalances and the need to reduce the regional imbalances through proper planning strategies. An attempt is made to study the different measures and indicators of development.

Chapter-II provides a clear picture about the spatial distribution of natural resources which in turn influences the economy of the region.

Chapter-III includes an analysis of the agricultural structure and the disparities in agricultural development at district and mandal levels.

Chapter-IV seeks to study industrialisation and regional variations in the levels of development of industries.

Chapter-V presents a detailed study of the social development as indicated by education and health and regional variations in their development.

Chapter-VI seeks to assess the levels of development and regional variations in infrastructural facilities like transportation, communication and power.

Chapter-VII includes a review and the major findings of the study and the policy implications for the over all development of the entire State so as to minimise the spatial variations.