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Rural Growth.

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PREFACE

How to provide effective and efficient linkages between spaces, activities and people is one of the central issues with which the urban planners and analysts are concerned the world over. Several approaches involving highly sophisticated models of how to provide and sustain such linkages have been evolved and experimented with in many situations, the results of which are, however, mixed. What we see in the countries is that as a result of the absence of any kind of relationship between spaces, activities, and people, the access to various services and functions is, at best, fragile, and is often discontinuous.

Of the many approaches, the one involving the identification and development of 'central places' has been the most sought after. It draws strength from the theoretical models of Christaller which suggests that an area is best served by goods and services if it has evenly distributed and spaced "central places". According to the model, these central places should form a hierarchical system. This study of the National Institute of Urban Affairs on the identification of central places for subregional development has attempted to examine the practical utility of this approach in the context of two districts, namely, Wardha in Maharashtra, and Dewas in Madhya Pradesh. The study has looked at the entire settlement pattern including the level and extent of relations between them in these two districts, and identified the discontinuities in the availability of services and infrastructures. The study has revealed that the existing approach to area and spatial planning is inadequate in as much as it takes no

cognisance of the various types of horizontal and vertical relationships between the various sizes of human settlements. It proposes that in relatively homogenous geographical regions, the identification and development of central places can result in greater efficiency and economies of scale in the provision of various orders of services and infrastructures.

This study has been designed, coordinated and prepared by my senior colleague, V.K. Dhar, Associate Professor in the Institute. He has raised some basic issues in this study, and asked, for instance, what is "urban", and what is "rural"; are these mutually exclusive, or is there a continuum between the two, rather, between the entire range of settlements. The basic thrust of the study is that while there is a general awareness to the mutual interdependence between the rural and urban areas, the policies and the action programmes have looked at them separately and resulted in the further fragmentation of their relationships.

V.K. Dhar has been ably assisted in the preparation of this report by several staff members of the Institute. I would like to complement them for the efforts that they have put in the study. Funds for the study were provided by the Ministry of Urban Development. The very fact that the Ministry agreed to fund this study shows their willingness to consider newer options in human settlements planning.

January 1988

Om Prakash Mathur
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CHAPTER I

INTRODUCTION

What is "urban" and what is "rural"? Are the two terms mutually exclusive or is there a continuum which cuts across the entire range of human settlements? Statistically speaking, census definitions round the World draw a clear line of demarcation between rural and urban places. In the historical past, urban settlements were distinct from their rural counterparts and were often surrounded by walls beyond which stretched the countryside. Today, however the criteria used to differentiate the two are as varied as the countries they refer to. At times, they vary even within the same country. Some of the major factors that characterise towns and cities are related to administrative status, population size and density, occupational patterns and land use.

A few examples can be cited to illustrate this point. In Egypt the term "Governate" is used to denote urban areas. There are also certain administrative criteria that are taken into account before an urban area is named as a Governate. Examples of Governates are Cairo, Alexandria, Suez, Port Said and others. The population size of settlements is another important criterion for determining an urban centre even though this criterion may vary in terms of population size. Sweden and Denmark, for example, have as low a limit as 200 inhabitants while Albania's industrial centres and towns have more than 400. Venezuela, Australia, New Zealand and Canada, specify a minimum population of 1000 in each urban centre; in Ghana, Korea, Austria, Pakistan and Iran the figure touches 5000 inhabitants.

Some countries including India have adopted several criteria in defining urban centres. Occupational and other urban characteristics are combined with size of population. Non - agricultural economic activity on the part of a large proportion of the inhabitants can perhaps be taken as an important characteristic. Others include population density and the existence of amenities such as piped water supply, a sewerage system, the presence of at least a few physicians and a pharmacy, a secondary school, a hotel, and a bus terminus.

The definition of an urban centre as laid down in the 1901 Census of India included:

i. every municipality, cantonment and all civil lines; and

ii. every other continuous collection of houses inhabited by not less than 5000 persons which the Provincial Superintendent of Census may decide to treat as a town.

In 1951 clear instructions were given that places even with a somewhat larger population which do not possess definite urban character should not be included, but smaller places with definite urban character could be treated as towns. There was a sharp increase in the number of towns from 2424 in 1941 to 3059 in 1951 - an over 25 per cent increase as compared to the 10 per cent in earlier decades. The more stringent definition of 1961 led to over 800 of these towns being declassified from urban to rural and, even with new additions, the total number of towns in 1961 came down to 2699.

The definition as set out in the 1981 census has generally been followed in India:

(a) All places with a municipality, corporation, cantonment or notified town area;

(b) All other places which satisfied the following criteria:

i. a minimum population of 5,000;

ii. at least 75% of the male working population being non-agricultural;

iii. a density of population of at least 400 per km (i.e., 1,000 per sq. mile)".

The Directors (census) were, however, given some discretion in respect of some marginal cases "in consultation with the State Government, to include some places that had other distinct urban characteristics and to exclude undeserving cases".

The above definition includes most of the criteria administrative, population size, density, occupational status and lastly urban characteristics. The limit of 5000 is by no means rigid and the classification of towns into six size categories* includes Class VI with populations less than 5000. There were 290 such towns in 1971 and 253 in 1981. In fact more than 41 towns in 1981 had a population of less than 2000 and a number even less than 1000 mostly in the hill areas.

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* Class I - 100000 and above Class II - 50,000 to 99,999
Class III - 20,000 to 49,999 Class IV - 100.00 to 19,969
Class V - 5,000 to 9,999 Class VI - Less than 5,000

Table - 1

Distribution of Rural and Urban Settlements, 1981

State/Union Territory	Number of places classified as villages with population			Number of urban places of all classes
	5000-9999	Over 10,000	Total	
States				
Andhra Pradesh	1058	163	1221	234
Assam	-	-	-	-
Bihar	1054	192	1246	179
Gujarat	418	49	467	220
Haryana	221	20	241	77
Himachal Pradesh	3	-	3	46
Jammu & Kashmir	20	1	21	56
Karnataka	401	35	436	250
Kerala	222	905	1127	85
Madhya Pradesh	155	4	159	303
Maharashtra	579	116	695	276
Manipur	12	1	13	32
Meghalaya	-	-	-	7
Nagaland	1	-	1	7
Orissa	47	1	48	103
Punjab	120	1	121	134
Rajasthan	321	21	342	195
Sikkim	-	-	-	8
Tamil Nadu	1000	182	1182	245
Tripura	56	8	64	10
Uttar Pradesh	751	52	803	659
West Bengal	702	82	784	130
Union Territories				
Andaman & Nicobar Islands	-	-	-	1
Arunachal Pradesh	2	-	2	6
Chandigarh	-	-	-	1
Dadra & Nagar Haveli	3	-	3	1
Delhi	15	-	15	6
Goa, Daman & Diu	34	1	35	17
Lakshadweep	1	-	1	3
Mizoram	-	-	-	6
Pondicherry	6	-	6	4
India	-	-	9036	3301

Note: Excludes Assam.
Source: Census of India 1981, Series I - India, Part II - A (i), General Population Tables.

On the other hand a very large number of places with populations of 5000 or above and even exceeding 10,000 were classified as villages and these were more than twice the number of all the towns and cities in the country as may be seen from the Table - 1.

An interesting aspect of the rigidity of the Indian classification can be seen in the fact that the 131 places of different sizes that were classified as urban in 1961, were under the same definition declassified and treated as villages in the 1971 census. And those that entered the urban category in 1971 did not do so in the lowest classes but in all sizes. However the position of new towns in 1981 fitted more or less into the lower classes.

Table - 2

Classification of Urban and Non Urban Settlements during 1961, 1971 and 1981

	Urban 1961 declassified to non-urban 1971	Non-urban 1961 classified urban 1971	Non-urban 1971 classified urban 1981
Class I	-	1	-
Class II	-	4	-
Class III	3	38	42
Class IV	35	119	254
Class V	70	284	422
Class VI	23	147	154
	131	593	872

Source: Census of India - 1971/1981 Series I - India Part II-A(i).

These apparent anomalies arise from the strict application of the criterion of occupation of 75 per cent being engaged in non agricultural pursuits, to the exclusion of the size factor in a country such as India with a relatively low level of industrialisation and with rather uneven dispersal. Even in a country like Japan the proportion is 60 per cent. Moreover, in no country is the size of the settlement given so low a weightage.

Nevertheless, the census definition gives urban status to many places than have been recognised by the various state governments for notification as municipal authorities under their respective enactments for urban local bodies. A large number of places that are statistically urban according to the census need not be urban administratively. Only about half the census urban places were constituted as fullfledged municipalities or city corporations and another 354 were notified area or town area committees. There were 58 cantonments recorded in the 1971 census making a total of 1944 urban local bodies - or less than two-thirds of the 3119 places classified as urban as may been from Table - 3.

The criteria for constituting a municipality differ considerably among the various states. In Tamil Nadu which has the largest number of urban places (439), as many as 329 do not come within the purview of urban local government because no town is given municipal status unless its population exceeds 20,000 and its annual revenue is substantially in excess of one lakh. The Gujarat Panchayat Act 1961 extended to places up to a population of 30,000 and following the passing of this Act, 42 towns with populations of 20,000 or less were converted into Nagar Panchayats, and 45 former municipal bodies with

populations less than 10,000 were designated as Panchayats. In 1971, in Gujarat, more than 150 towns had Panchayats and only 59 had municipal authorities. On the other hand there are many municipal bodies with populations of less than 5000; practically all the census urban places in Haryana, Punjab, Jammu & Kashmir, Rajasthan are urban

Table - 3

Local Bodies in Urban India- 1971 Census

State/Union Territories	Municipalities corporations & town area committees	Cantts. & notified area	Panchayats & non-municipal	Total
States				
Andhra Pradesh	83	1	140	224
Assam	21	30	23	74
Bihar	54	50	98	202
Gujarat	57	2	157	216
Haryana	59	6	-	65
Himachal Pradesh	19	16	1	36
Jammu & Kashmir	2	43	-	45
Karnataka	174	9	62	245
Kerala	30	2	56	88
Madhya Pradesh	180	10	60	250
Maharashtra	224	8	57	289
Manipur	1	7	-	8
Meghalaya	1	2	3	6
Nagaland	-	3	-	3
Orissa	25	39	17	81
Punjab	100	7	1	108
Rajasthan	145	2	10	157
Tamil Nadu	91	19	329	439
Tripura	1	-	5	6
Uttar Pradesh	156	147	22	325
West Bengal	88	7	131	226
Union Territories				
Andaman & Nicobar Islands	-	-	1	1
Arunachal Pradesh	-	1	3	4
Chandigarh	-	-	2	2
Delhi	2	1	-	3
Goa, Daman & Diu	13	-	-	13
Pondicherry	6	-	-	6
India	1532	412	1178	3122

local bodies. Uttar Pradesh has a separate category of Town Areas under a separate Act for its small towns with populations around 5 ,000, while Municipal Boards are constituted for places with about 20,000 population. A large majority of such town areas in U.P. have, however, been treated as villages under the census.

Kerala is in a class by itself. It does not have nucleated villages. Its "rural areas" are merely linear extensions of urban concentrations and the average size of its 1268 census "villages" works out to 14,102 inhabitants. The average size of a Panchayat exceeds 20,000 and Panchayats function more or less in the same style as municipalities. Kerala is indeed a collection of rural towns interspersed with larger administrative and commercial centres.

It will thus be seen that if only the administrative test of notified urban local bodies were applied, more than one-third of the places classified as urban will become rural; but if the size test of 5000 population, which is more usually accepted in U.N. estimates, were applied the number of urban places will increase by three times and over 55 million will be added which is more than 50 per cent of the total urban population in 1971. Such is the paradox of urban and non urban centres in the Indian context. Nevertheless, it is the total urban population according to the census that is regarded as the statistical index of the level of urbanisation at a given time.

The dominant process of transition from rural to urban in India and in other developing countries, today is that of migration from the rural, and not so rural, settlements to the city and metropolitan areas which grow twice as fast or faster than the "rural" population.

The volume of this inflow is so large and so rapid as to create almost insurmountable problems; on the one hand, for the rural migrants who go through a painful process of adjustment to the urban environment, and on the other, for the city governments struggling in vain to augment services to meet the staggering challenge of this influx.

This is evident from the fact that a substantial majority of the increase in urban population is claimed by major cities. The projections of India's urban population from 159.7 million in 1971 to a moderate estimate of 326 million in 2001 also envisage a continuing process of flow into the major cities. The number of additions to the urban family of human settlements lags far behind as in the past. The number of urban places increased from 2699 in 1961 to 3301 only in 1981 while the urban population almost doubled from 78.9 million to 159.7 million. Taken over a longer period of 70 years the number of urban places increased by 62 per cent and the urban population by 322 per cent between 1901 and 1971.

The alternative process of change over of rural settlements to urban has not received the attention it deserves. The fact that 9036 so-called "villages" have populations exceeding 5,000 or even exceeding 10,000 is evidence of their vitality and growth potential, but the absence of any infrastructure worth the name is a serious handicap to their development as agents of urbanisation. Such large agglomerations of people indicate a diversity of activities that can receive a fillip if necessary facilities and organisational inputs are provided. Urbanisation policies, like any development policies, have to be based on dispersal and the two are interlinked. One of the

reasons for the failure to ensure against regional imbalances and to provide dispersal of employment opportunities to lesser settlements - small towns or large villages - is the absence of linkages between urban infrastructure and industrial location. Policies of urbansiation and economic planning have to be related to the common base of human settlements. Only then can one expect a comparative release of pressure on major urban centres as well as a balanced absorption of the large labour force projected for the year 2001.

Settlement Theory and Development

A brief note on settlement theory will not be out of place here. There are two major approaches to settlement hierarchy research. One of them involves the assessment of goods and services available in the central place and the ranking of the central places on the basis of goods and services offered. This was done rather elaborately by Smailes and others for England and Wales. The other method aims at determining the area dependent on the central place for the goods and services offered. What is the extent of the region served by the central settlements? How far and in what direction does the region extend? To what degree does the region depend on the central settlement for the goods and services offered? Answers to each of these questions provide useful criteria by which relationships between the central settlement and the region can be measured.

Most of the deductive analyses of settlement hierarchy take Christaller's central place theory as the starting point. The investigation of size-distribution of cities, classification of settlements according to the levels of hierarchy and the research on

the functional correlates of the city-size are not mutually exclusive. There does exist some sort of relationship between them. The central place theory at the moment, is the most useful means of discovering that aspect which binds the three factors together.

Christaller's Concept of Central Places

The most important aspect of Christaller's idea of the central place system is the central place itself. This basic unit is in no way related to a city or a town or even a community. But christaller's research on the question of size, number and distribution of settlements is predicted upon a specific understanding of the meaning of a settlement. A common denominator was necessary to relate towns or settlements of different sizes performing different functions. Settlements have both geographical space and population in common, but the basic element of a central place is the provision of goods and services to an area larger than itself. The services may be extensive or limited, nevertheless the function of a service centre is common to all. Population size was considered, but function was the keynote.

After taking into account population size, area and also the historical, political and economic background of the settlements, Christaller points to the role of the settlement as a market centre as the chief characteristic of the central place. The task of the central settlement, as stated earlier, is to supply goods and services to a larger area than its own. A hinterland, he observed, is as necessary a complement to the town as the town is to the region. He warned against the danger of over emphasising the importance of the

central settlement at the expense of the region. The region is a self-contained entity in so far as the services provided by the central settlement are offered to and maintained by the region. However, not all the functions of the central settlement are offered to and maintained by the region. They may cater to distant markets and may affect a wider complementary region. Hence, the wider the area served, the higher may be the ranking of that settlement in the hierarchy.

Central Place Theory

The central place theory is based on a consideration of the characteristics of the space economy. The model is spatial and can be represented by equations and geometric figures. A very simple fact of the space economy is that the shortest and, therefore, the most economical connection between two points is a straight line. This is valid for densely populated regions as well as for the thinly populated areas. Economically the most favourable development for traffic is the three-axes type, in which the traffic routes cross one another at one point, that is, six traffic routes radiating from one point.

According to the theory : (a) An area is best furnished with services and best supplied with commodities offered in the central place, if the central places are distributed evenly over the entire area. In this way, a minimum number of central places are enough to serve an area properly; (b) in the context of a space economy, these central places form a hierarchic system, from the smallest rural settlements to the largest urban settlements; (c) central places of

equal order in the hierarchy are evenly spaced; (d) the spatial distribution and the number of control places of any order will vary : (i) if the principle of optimum supply to the complementary region is predominant, then there are two central places of the next lower order for any central place of the higher order (ii) if the principle of optimum traffic facilities predominates then there are three places of the next lower order for each one of the higher order, (iii) if, however, the principle of most favourable administration predominates, then there are six central places of the next lower order, evenly spaced in the complementary region.

The Limitations of theory

The nature of the generative forces which determine settlement patterns, and the characteristics of the resultant dependency relationships, have been the subject of much inquiry in an effort to formulate theories to explain these phenomena. Settlement theory has developed over the last hundred and fifty years or so, mainly from the theoretical foundations laid down by Von Thunen, Christaller and Losch, through their work concerned with understanding of forces affecting land use and the location of settlements, and their efforts to define the principles that generate these forces.

Settlement theory embodies the concept of a landscape filled with nesting settlements, forming a hierarchy of dependency relationships, with each settlement having its on productive hinterland and the whole being delicately maintain in a state of equilibrium by a network of interconnecting links. The neatness of this concept is based on a number of assumption which are open to question when viewed from a

developing country.

The first assumption is that change is the product of outside factors and that the natural state of any given settlement pattern is in equilibrium. Therefore once an adjustment has been made, as a reaction to an external event, a state of equilibrium would be resumed. In reality, setlements are in a continuous state of change, and growth may not only affect the overall settlement pattern but may change the value of the step within the hierachical structure to such an extent that a permanent imbalance occurs. This is particularly true with regard to the impact of improved communications creating greater mobility. A related assumption is that behaviour is rational and that locational decisions are the result of a careful examination of the relevant factors. The belief that the supliers and consumers of services will always arrive at an economic equilibrium ignores the very important influence of cultural, political and social factors on decision making.

Criticism can also be directed towards the level of simplicity inherent in the development of settlement theories. The general assumption of development taking place on an isotropic plane is clearly not borne out in practice when topographic, climatic, social and political factors are likely to be major constraints distorting the idealised distribution of settlements. At a higher level of analysis, the process is based on the aggregation of settlements assuming that the sub-region represents an adequate upper scale of analysis. Again, in practice the role of primate cities, national and even international policies, may have a significant impact on settlement patterns at the rural level.

A further limitation is that setlement theory has esentially developed as an analytical tool designed to aid the understanding of economic relationships at one specific moment of time. It does not indicate either the process of evolution which resulted in the particular settlement pattern, nor how specific situations may change in the future. This emphasis on descriptive rather than prescriptive settlement theories is a particular limitation now that communications technology is tending to reduce the spatial compoent of urbanisation and replace it with a concept of urban life based on access to services.

In addition to the general criticism that settlement theories are too simplistic and static in their approach, they can also be criticised for being too compartmentalised. Analytical techniques have been developed to examine specific aspects of land uses and, although the techniques can be aggregated to built up a general picture of development, there is no simple technique which is comprehensive in bringing together the overall pattern of growth and change.

Regional and Locational Dimensions in National Planning

Human settlements can be viewed from different angles by different professional and research disciplines, and also by the people who live and work in them. Consequently, there is a multitude of dimensions and problems : physical, economic, social and cultural. The problems of human settlements have their impact at various levels: global, national, regional, local and also within a settlement. Human settlements are not passive, nor are they were physical variables in

development. They vary in population size, growth, functional structure and spatial patterns of distribution and linkages. The size, structure and linkages are in a state of constant flux associated with economic, social and technological changes. Planning intervention through investment and development, and of course, political pressures and historical legacy, all have their due share in the development or differential development of settlements. Further, the uneven distribution of natural resource endowment and human resources, and the uneven development surface lead to sharp variations in the distribution of settlements.

Past and Present Government Policies with regard to Integrated area development

The regional imbalances that have developed in the country during the last three decades have made it necessary for future programmes to keep in view regional considerations in the investment pattern and avoid further aggravation of the regional differentials in income, employment, general living standards, and so forth. While there have been only sporadic references to rural-urban relations in the First and Second Plan documents, the Third Plan contained chapters on "Balanced Regional Development", and "Housing and Urban Rural Planning". The Fourth Plan referred at length to the need for redressing inter-state and intra-state imbalances in development which included, by implication, the rural problem as well. The Fifth Five Year Plan accepting the Fourth Plan strategy enlarged the scope of urban development in small and medium towns for regulating the growth of giant metropolises. It was against this background that the idea

of multilevel planning was used for the first time in the Fifth Plan.

The Sixth Five Year Plan strives to achieve a balanced national growth, where in the development programmes for backward regions call for special attention.

Following the decision of the National Development Council during the sixth Plan, a centrally sponsored scheme of Integrated Development of Small and Medium Towns (IDSMT) was introduced during 1979-80 covering 235 towns each of 1 lakh and below population with 50 per cent financial assistance to the states on matching basis. The intent of the programme had been to provide a fillip to the growth of small and medium towns through planned development. "Guidelines" for the preparation of "integrated projects" were issued to the State Government and Union Territories in December 1979. The thrust of the new urban policy enunciated in the second document of the Sixth Five Year Plan (1980-85) was towards giving greater emphasis to the provision of adequate infrastructural facilities in small and medium towns as well as intermediate towns, which have been neglected so far. The aim was to strengthen these towns in order to equip them to subserve as growth and service centres for the urban hinterlands and also reduce the rate of migration to large cities.

The difference of approach between the two Sixth-Plan documents is that, in the case of the Sixth Five Year Plan (1978-83), the approach was to slow down and, if possible, reverse the rate of growth of metropolitan cities by paying greater attention to the growth of small and medium towns which possess a greater potential for relieving much of the burden upon large cities, and can function as growth

centres for surrounding village as well as to reduce the rate of migration to the large cities. But in the Sixth Five Year Plan (1980-85), there has been a slight deviation in the policy. Instead of slowing down, and if possible, reversing the rate of growth of metropolitan cities the new policy is directed to optimise investment from the viewpoint of both regional and national growth by increased investment in large cities for sustaning their economic base as well as improving their conditions of life, and at the same time, making investment in physical and social infrastructure of small towns or large villages and medium towns. The Seventh Plan also underlines the need firstly to have interaction between physical and investment planning and secondly, to prepare regional and urban subregional urban developent plan to make the first possible.

Study Background

It has since long been proved that central places hold the key to the development of their surrounding economies. For the rural economy, a central place is a small or medium towns or in its absence a large village which should provide functional support and services to its tributory area. It is located as far as feasible, at the minimum distance from the settlements it services and is connected by local means of transportation.

The higher order places provide more specialised functions and support middle and lower order places which are Service Centres for their command area. In addition higher order centres also provide functions required to be catered for by the lower order settlements particularly when the lower or middle order settlement are absent or

relatively weak, thus causing polar sation of population and economic activities in a few larger places.

Under the circumstances the development of growth centre can help a great deal in providing support to rural areas and can help promote desired hierarchy of settlements and central places serving their respective hinterlands. According to Christaller the varying levels of centrals places are identified by the two major properties:

i. the type and volume of functions offered by these places and

ii. the degree of dependence of other settlements on such central places for these functions.

In India for instance, the British rule, gave the Imperial objectives of law and order and revenue collection far greater weight in establishment of administrative headquarters like Tehsil/Taluk and Thana circles which subsequently grew into a kind of central places. It can certainly be hypothesised that if considerations of economic development and optimum utilisation of local reasources as well as infrastructural built-up were considered in a spatial relationship along with people's choice and convenience the pattern of growth centres would turn out to be different with far greater balance between the different levels of human settlements.

The existing settlement pattern thus only tends to increase imbalances with lop-sided development against the backward tracts. During the last 25 years there has been an attempt to identify more places as supporting growth centres to meet development needs but by and large the decisions are more administrative and political rather than based on scientific criteria.

Objective and design of the study

The proposed study of "Rural Growth Centres : Planning for Human Settlements" is a case study of the applications of the concept of functional organisation of a region around a few settlements which become nodal to the surrounding areas.

Rural Growth Centres : Hypothesis

In the development world, the ratio of villages to settlements with populations of more than 2,500 people averages 16 to 1. In the developing world the figures range from a low of 50 to 1 to around 3000 to 1 in India. Clearly if the majority of the population who live in rural areas are to be expected to contribute to developent and enjoy some of the benefits, consideration needs to be given to both the distribution of settlements in space and their place in the hierarchical structure.

Larger villages have the potential to function as service centres to the adjoining rural areas. This attributes of these settlement system need to be explicitly recognised in allocating investments for development of infrastructure, along with plans to provide an economic base which is necessary to sustain the infrastructure for better living. Economic bases need not always be equated with industry. Commercialisation of agriculture, if properly harnessed could contribute to the improvement in the economic status of the people. Even in the development of industry, the "tenet of appropriateness" (i.e. different types of industries in different sizes of settlements in different regional settings) should be the policy. There are

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empirical evidences to show the positive tendencies towards an urban-rural continuum exist, at least in the commercial irrigation farming regions, and within the metroplitan regions. But there is no policy/programme to integrate the spatial structure of the economy with the settlement structure : both intersettlement and intrasettlement. In developing regions, a periodical review is necessary to align the changing development profiles. In this system of planning settlements, the service function (education-health-retail services) constitutes the key function. In this context, categorisation on the basis of production structure and functions, instead of population size, is more meaningful for planning and understanding the development problems specific to functional structure, and consequently, specific to the position of the settlement in the whole settlement and regional hierarchic system.

Any system of settlementsis primarily meant to serve as a vehicle for making available the necessary support both for production and distibution of goods as also for bringing social services within the easy reach of the people. In order that the settlements of the various sizes perform their historic role of catalysts for the surrounding economies, they must be equipped with adequate socio-economic and physical infrastructure.

Objectives

The objective of the study is to develop a methodology for provision and suitable location of growth centres particularly at the lower level of a settlement system. In the study, although the due weightage has been given to historical factors and making full use of

available infrastructure in existing setlements, it seeks to identify new locations in a spatial framework to meet the development needs of local communities.

Design of the study and the study area

The study has been attempted at the district level. The selected case study of Wardha district (Maharashtra) and Dewas District (M.P) was oriented to an assessment of the spatial pattern of settlements, function and their relative importance or rank and the hierarchic nature of space relations, if any for the settlements. This provides a larger regional setting in which the relative importance of settlements of different sizes could be ascertained both at the district level and the Tahsil level. The physical landscape and its spatial variations provided some clues to the variations in land use structure and productivity and also in influencing the emerging pattern of transport and growth of some settlements as nodal centres. The demographic characteristics, the services and facilities and the specialised functions were analysed both by tabulation and mapping.

The study of space relations was carried out by mapping and tabular analysis of the data on bus frequency. The groupig of settlements on the basis of nodal hierarchy and rank by composite score provided the basis for arriving at the pattern of settlement hierarchy. Sample survey of selected villages was carried out to supplement the knowledge of regional structure and an attempt was made to gather information related to agricultural productivity, input, yields, available surplus, market at which they are sold & travel pattern for essential services and amenities. This provided a basis

for a comparative analysis of the pattern of settlement hierarchy in the districts based on the various movements and the bus frequency which are often missing in the generalized studies based on the secondary data alone.

Based on the results of these studies, an attempt is made to highlight the basic strategies in district planning viewing it essentially as an exercise in formulating and implementing the plan in terms of its real and locational component.

CHAPTER II

WARDHA DISTRICT: MAHARASHTRA

REGIONAL STRUCTURE: SALIENT FEATURES AND SETTLEMENT PATTERN

A settlement system may be identified as a dynamic entity that functions as a whole because of the inter-depedence of its parts. It is an open system as it is linked with the national settlement system and depends upon it in several ways. The shape of a settlement system in a region is a function of its physical and cultural constraints that is, the physical landscape directly or indirectly influences the spatial arrangement through its influence on agricutlure, landuse or in the spatial arrangement of the human settlement in terms of rural and urban population, social services and amenities, economic activity and transport routes. An attempt is made here to highlight these aspects of the regional structure and their spatial characteristics which influence the pattern of development.

Background

Wardha, the district headquarters, is the least populated district of Maharashtra state. The district owes its name to the river Wardha which flows along the entire northern, western and partly southern borders of the district.

In 1956, as a result of the reorganisation of Indian states this district was transfered from Madhya Pradesh to the erstwhile Bombay state and subsequently, in 1960 became part of Maharashtra when that state was formed. There have been no jurisdictional changes in the district since. In 1960, there were three talukas in the district with six towns and 972 inhabited villages. According to the 1981

census, though the number of talukas (tahsils) and urban centres remained the same, the inhabited villages showed an increase of only 4.42 per cent (1015) in two decades.

The district lies towards the eastern side of Maharashtra between 20° 18' and 20° 21' north latitude and 70° 30' and 79° 15' east longitude. The districts around it are Amravati to the north, Nagpur to the east, Chandrapur to the south-east and Yavatmal to the south.

Wardha is located at a distance of 79 km. from Nagpur, a metropolitan city, 116 km. from Amravati, 69 km. from Yavatmal and 87 km. from Chandrapur. According to the 1981 census, the total land utilisation area of the district is 581600 hectares with a total population of 926,618 persons.

Physical Landscape

The northern part of the district is a hilly terrain formed by the spurs projecting from the southern range of these hills with its highest point at Jaitgarh (625 m. above MSL) which actually forms the watershed of the district.

Wardha and Wuna are the two main rivers of the district. Numerous streams originate from the northern and western sides of the range and join the Wardha river which more or less forms the boundary of the district on the western side. In the south and in a south-east direction, the Dham, the Bor and Yesoda rivers flow down the gentle undulating plains forming part of the Wuna sub-basin.

Climate

Wardha district is relatively cooler than Nagpur district. The maximum and minimum temperatures in year are 45°C and 16°C. The variations in the temperature on the same day are considerable at all times of the year, and a rapid change from the heat of the day to a cool night is particularly remarkable in the summer months.

Rainfall

The annual rainfall varies from 900 mm. in the north-western part to 1250 mm. in the south-east. The bulk of the rainfall occurs during the rainy months from June to September.

Communication

Wardha, the district headquarters, is connected with Nagpur by State Highway. It has a broad-gauge section of the Central Railway connecting it with Bombay, Nagpur and Kazipet and a narrow gauge of the Central Railway connecting it with the tahsil headquarters of Arvi and Pulgaon towns. It is also well connected with all the tahsil headquarters (Wardha, Arvi and Hinganghat) by good motorable roads.

Irrigation

The present irrigation facilities are very meagre and account for only four per cent of the net sown area. The area under different sources of irrigation is given in Table 4.

Table - 4

Irrigation System, 1982, Wardha District

S.No.	Source of irrigation	Area in hectares	%
1.	Government canals	3807	17.77
2.	Tanks	353	1.64
3.	Wells	16351	76.37
4.	Other sources	904	4.22

Source: Wardha District Plan on Gandhian Lines, Planning Commission, Govt. of India, 1982.

The major source of irrigaion has been the wells. Most of the canal irrigation has been concentrated in Wardha tehsil. There are 35278 wells in the district of which 10953 wells were not in use during 1977-78 while wells in use were 1460. The remaining 9721 wells were domestic wells. In Wardha tehsil, out of 14770 wells only 6893 wells were in use during 1977-78. 3625 wells were not in use while the remaining 4261 wells have been classed as domestic wells. There are about 28 minor irrigation works other than wells, which irrigated 6530 hectares of land. The irrigated area under different crops is given in Table - 5.

Table - 5

Irrigated Area Under Different Crops, 1982, Wardha District

(area in hectares)

S.No.	Crops	1976-77	1977-78
1.	Rice	127	79
2.	Wheat	13512	14184
3.	Kh.Jowar	8	-
4.	Total cereals	13553	14284
5.	Gram	282	224
6.	Tur	-	-
7.	Total pulses	304	241
8.	Sugarcane	145	240
9.	Cotton	1166	1074
10.	Groundnut	5	-
11.	Condiments and spices	809	825
12.	Fruits and vegetables	NA	4991

It may be mentioned here that ground water is the principal source of water supply in this district and chemically the ground water is found to be fresh and suitable for agriculture, domestic and industrial purposes.

Soils

Almost the entire area of the district consists of a thin covering of black or dark brown soil over a sheet of trap rock. The soils, derived from volcanic trap, quite fertile and capable of producing very good cotton and Jowar crops. The soil varies in depth from a few inches to ten feet, the average thickness being about two feet. It is generally found mixed together with nodular limestone, the exposed fragments of which are collected and burnt for building purposes. The eastern half of Hinganghat tahsil, the northernmost corner of Wardha tahsil and the central part of Arvi tahsil have a shallow type of soil. The western quarter of Hinganghat tahsil and the western strip of Arvi tahsil contain medium soils. The best soil in the district however, is found in the level tract lying along the eastern bank of the Wardha river in the Arvi tahsil. The soil here is formed of detritus drained down from the hills and helps grow exceptionally good crops of cotton. The remainder of the Arvi tahsil is hilly and undulating, and contains the largest proportionate area of inferior soil. The north-east of Wardha tahsil is also hilly but the centre and the south of Wardha and nearly the whole of Hinganghat consist of an undulating plain.

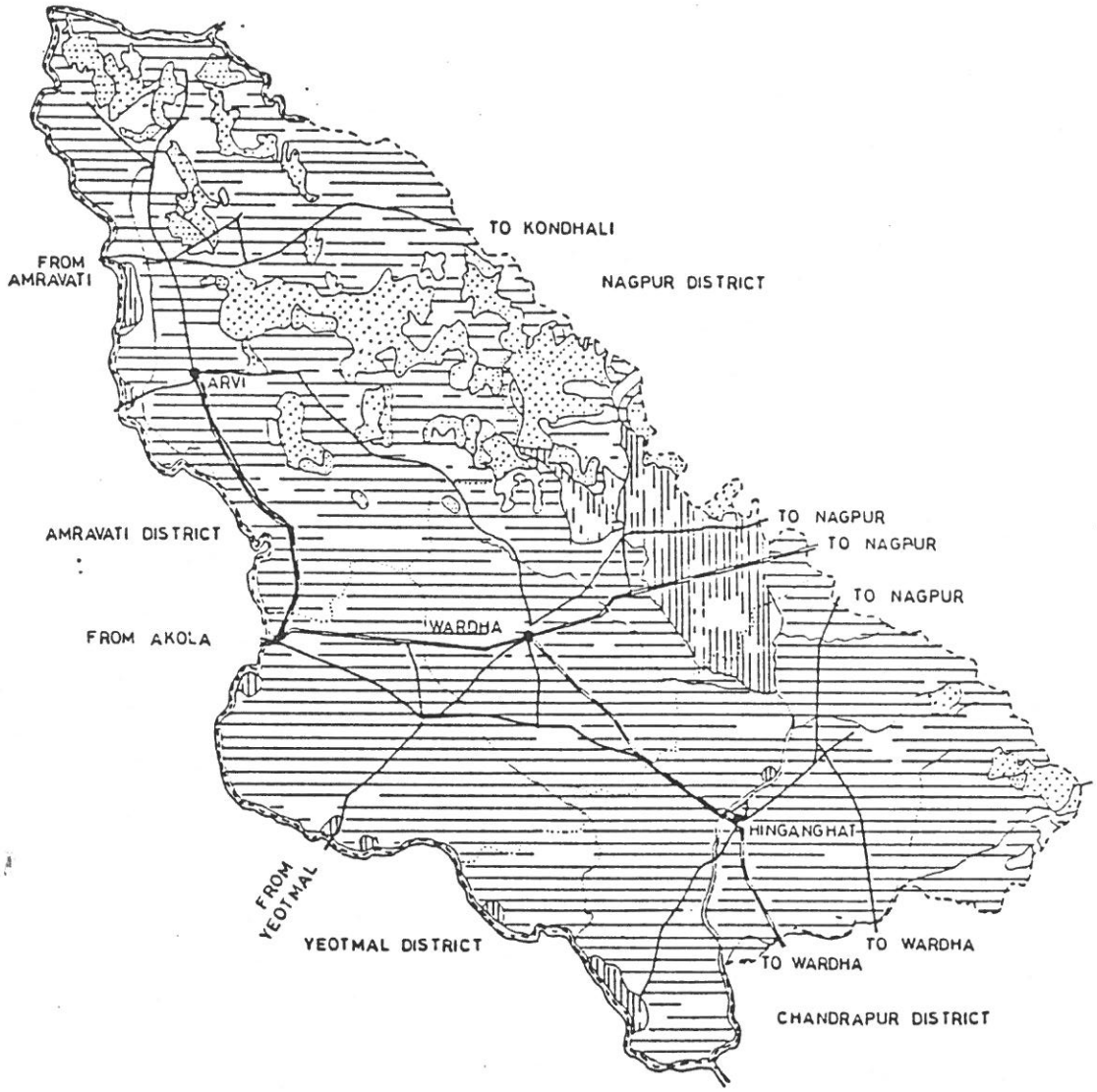
The soils of the district can thus be grouped under four main classes vis; Kali, Morand, Khardi and Bardi. The soil that occupies the greater part of the district is kali or rich black soil. Rabi crops which are grown on it are some times not so good as those on brown soil, for it is such a severe stran on the bullocks to plough kali soil that it is often left insufficiently disturbed. As a reslt wheat grown in it is often of a short straw quality. However, with a good quality of plough cattle the soil can be well tilled. For rabi pulses such as lentils, peas and tiura, kali is a favourite soil.

Morand is a black or dark brown soil generally mixed with limestone grit. It differs from kali in athat it is composed of large particles which do not stick so closely together. Its clods are less hard and when saturated it does not turn into fine mud while in dry weather it cracks less. This is the commonest soil in the district and is also sub divided into Morand I and Morand II. Morand is the wheat soil of the Wainganga plain. In embanked fields, both classes of morand carry double crops.

Khardi and bardi are lighter types of soil and are found mostly in the eastern and northern parts of the district. Their depth is less than three inches. Khardi, to be more specific, is a poor and shallow dark soil mixed with sand, while bardi is hilly land strewn with stones. Locally, the soils are further categorised into retari or regular sandy soil and kachar or alluvial land on the banks of the streams which, however, are found in insignificant quantities. But on

PRESENT LAND USE MAP

WARDHA DISTRICT
MAHARASHTRA STATE



SCALE

Km. 5 0 5 10 15 20 KILOMETRES

LEGEND:-

- DISTRICT BOUNDARY
- TAHSIL BOUNDARY
- ROADS
- RAILWAYS
- TAHSIL H.Q.
- PROTECTED FOREST
- RAINFED SINGLE CROP
- RESERVED FOREST
- IRRIGATED DOUBLE CROP
- RIVER OR NALA

MAP-1

N

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the whole the soil over a major part of the district is fertile. Good quality land is localy known as gahari or wheat land, whether wheat is actually grown there or not. It may be added here that the selection of wheat as a standard crop in Wardha was found to be unsatisfactory and it has yielded place to cotton & jowar which ranks first and second among all the crops grown in the district.

Land Use

The land use pattern has been studied in two important dimensions: the land utilisation by major heads and the cropping pattern, and the spatial distribution of land under cultivation by important crops. (Map - 1).

Land Utilisation

Of the total geographical area, hardly 2.84 per cent of the net sown area is cropped more than once. Pastures and cultivable waste together accounts for 10.19 per cent of the total area and the area under forest is 10.62 per cent. The land utilisation pattern of the Wardha district (tehsil-wise) is given in Table - 6.

Table - 6

Land Utilisation Pattern (Tehsil-wise), Wardha District

(area in '00h.)

Particulars	Wardha dist.		Wardha tehsil		Arvi tehsil		Hinganghat tehsil	
	1960	1980	1960	1980	1960	1980	1960	1980
1. Total net sown area	4043 (64.28)	4217 (67.05)	1518 (37.54)	1544 (36.61)	1139 (28.17)	1176 (27.88)	1386 (34.28)	1497 (35.49)
2. Pastures & cultivable waste	802 (12.75)	641 (10.19)	211 (26.30)	184 (28.70)	346 (43.14)	309 (48.20)	245 (30.54)	148 (23)
3. Forests	662 (10.52)	668 (10.62)	195 (29.45)	202 (30.23)	412 (62.23)	412 (61.67)	55 (8.3)	54 (8.08)
4. Area gropped more than once	36 (0.57)	179 (2.84)	9 (25)	91 (50.83)	17 (47.22)	65 (36.31)	10 (27.7)	23 (12.84)

Note: Figures in brackets indicates percentages.

Source: Socio-economic review of Wardha district, 1981-82.

Table 6 reveals that the landuse under different heads has followed the same proportion during the two decades at both district and tehsil levels except for a decrease in the total area under pasture and cultivable waste (2.56%), particularly in the Hinganghat tehsil (7%) and secondly, the increase in area cropped more than once (2.27%) in the district through its increased share in Wardha and Arvi tehsils.

The Cropping Pattern

The net cropped area of the district is 4.2 lakh hectares and accounts for 67 per cent of the total area. The distribution of gross cropped area by major crops with their respective yield kg/hac. can be seen in Table - 7.

Table - 7

The Cropping Pattern and the Yield (kg./hec.) (Tehsil-wise), Wardha District

Crop and District & tehsils	Area in hec.		Yield kg/h.		%variation in area	%variation in yield	%area to total croped area		% yield to total yield		%share of crops area in the tehsil with respect to Wardha D.		
	1960	1980	1960	1980	1960-1980	1960-1980	1960	1980	1960	1980	crops	1960	1980
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.
Cotton													
Wardha District	164838	191571	33	73	16.21	121	41.60	44.70	68.90	75.49	cotton		
Wardha tehsil	63062	74582	NA	NA	18.26	NA	42.54	46.54	NA	NA	W	38.35	38.93
Aarvi tehsil	56922	53333	NA	NA	-6.3	NA	49.20	42.87	NA	NA	A	34.53	27.83
Hinganghat tehsil	44854	63656	NA	NA	4.19	NA	33.85	44.25	NA	NA	H	27.21	33.22
Jowar (Rabi & Kharif)													
Wardha District	108910	130613	398	820	19.92	106	27.88	30.48	4.88	4.98	Jowar		
Wardha tehsil	45110	50152	NA	NA	11.17	NA	30.43	31.29	NA	NA	W	41.41	38.39
Arvi tehsil	33385	42254	NA	NA	26.56	NA	28.90	33.96	NA	NA	A	30.65	32.34
Wheat													
Wardha District	49498	34468	351	1285	-30.37	266	12.49	8.04	4.31	7.81	Wheat		
Wardha tehsil	15646	12359	NA	NA	-21.0	NA	10.55	7.7	NA	NA	W	31.60	35.86
Arvi tehsil	3085	4607	NA	NA	49.33	NA	2.67	3.7	NA	NA	A	6.23	13.36
Hinganghat tehsil	30767	17496	NA	NA	-43.13	NA	23.22	12.16	NA	NA	H	62.15	50.76

Contd.....

Table - 7 (contd.)

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.
Sesamum													
Wardha District	7470	8179	204	153	9.49	-25	1.88	1.91	2.5	0.93	Sesamum		
Wardha tehsil	335	592	NA	NA	76.71	NA	-0.2	0.36	NA	NA	W	4.48	7.23
Arvi tehsil	56	187	NA	NA	233	NA	0.04	0.15	NA	NA	A	0.74	2.28
Hinganghat tehsil	7079	7400	NA	NA	4.5	NA	5.34	5.14	NA	NA	H	94.76	90.47
Rice													
Wardha District	3322	7380	398	620	122	266	0.84	1.73	4.88	3.77	Rice		
Wardha tehsil	738	2086	NA	NA	183	NA	0.49	1.3	NA	NA	W	22.22	28.26
Arvi tehsil	1503	3023	NA	NA	101	NA	1.3	2.43	NA	NA	A	45.24	40.96
Hinganghat tehsil	1081	2271	NA	NA	110	NA	0.8	1.57	NA	NA	H	32.54	30.77
Groundnut													
Wardha District	1199	5193	593	570	330	-4.3	0.30	1.21	7.28	3.46	Groundnut		
Wardha tehsil	805	1307	NA	NA	62.36	NA	0.5	0.8	NA	NA	W	67.13	25.31
Arvi tehsil	360	3795	NA	NA	954	NA	0.3	3.05	NA	NA	A	30.02	73.50
Hinganghat tehsil	34	61	NA	NA	79.40	NA	0.02	0.04	NA	NA	H	2.83	1.18
Gram													
Wardha District	5336	3899	343	316	-26.93	-7.87	1.34	0.9	4.21	1.92	Gram		
Wardha tehsil	1588	855	NA	NA	-46	NA	1.07	0.53	NA	NA	W	29.76	21.92
Arvi tehsil	1947	1814	NA	NA	-6.8	NA	1.68	1.45	NA	NA	A	36.48	46.52
Hinganghat tehsil	1801	1230	NA	NA	-31.7	NA	1.35	0.85	NA	NA	H	33.75	37.54

Contd.....

Table - 7 (contd.)

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.
Pulses (other than grams)													
Wardha District	47386	37607	NA	NA	-20.63	NA	11.96	8.77	NA	NA	Pulses,gram		
Wardha tehsil	18067	14478	NA	NA	-19.86	NA	12.18	9.03	NA	NA	W	38.12	38.49
Arvi tehsil	14996	11237	NA	NA	-25.06	NA	12.98	9.03	NA	NA	A	31.64	29.88
Hinganghat tehsil	14323	11892	NA	NA	-16.97	NA	10.81	8.26	NA	NA	H	30.22	31.62
Total Pulses													
Wardha District	52722	41506	588	581	-20.63	+-	13.30	9.68	7.22	3.53	Total pulses		
Wardha tehsil	19655	15333	NA	NA	-21.98	NA	13.26	9.56	NA	NA	W	37.28	36.94
Arvi tehsil	16943	13051	NA	NA	-23	NA	14.6	10.49	NA	NA	A	28.44	31.44
Hinganghat tehsil	16124	13122	NA	NA	-18.61	NA	12.16	9.12	NA	NA	H	27.16	31.61
Fruits & Vegetables													
Wardha District	2908	5710	NA	NA	96.35	NA	0.73	1.33	NA	NA	F & V		
Wardha tehsil	1277	2984	NA	NA	133	NA	0.86	1.86	NA	NA	W	43.91	52.25
Arvi tehsil	1291	2339	NA	NA	81	NA	1.1	1.88	NA	NA	A	44.39	48.96
Hinganghat tehsil	340	387	NA	NA	13.82	NA	0.25	0.26	NA	NA	H	11.69	6.77

The spatial distribution by major crop in the year 1980 shows that about 75 per cent of the gross cropped area is distributed over two crops cotton (44.70%) and jowar (30.48).

The yield of cotton (in kg/h.) in 1981, accounts for 75.49 per cent of the total yield, followed by wheat (7.8%), jowar (4.98%), rice (3.77%), total pulses (3.53%), groundnut (3.46%) and sesamum (0.93%).

The area/yield variation analysis between 1960-80 can be grouped in the following manner:

i. Increase in crop production vis-a-vis decrease in area. The production of wheat has increased 3.6 times during the period (1960-80) while the area decreased by 30 per cent. This may be due to the use of modern inputs in agriculture such as high yield varities, and by harnessing the advantages of technological advancements in the field.

ii. Higher increase in the yield with increase in area. Cotton and Jowar fall under this category. Both the crops have registered a growth of more than 100 per cent through a relatively marginal increase in area from 16 to 20 per cent.

iii. The production of crops has either remained static or has decreased with the increase in area. The area under rice has increased 2.2 times while the increase in yield is found to be only 1.5 times.

Groundnut is another crop where the yield has declined marginally while its area has registered a very substantial increase of three times.

iv. Decrease in crop production and area. Total production of pulses, including gram, has decreased both in yield and area, the former being very marginal, by 1.2 per cent and the latter by 21.27 per cent.

In the absence of tehsil wise data on the yield of different crops, an attempt has been made to analyse the productivity of important crops such as cotton, jowar, wheat, rice and groundnut in different tehsils of the district.

It may be mentioned here that the selection of crops has been influenced by (i) the growth profile (area and yield), and (ii) the importance of these crops in the economy of the district by way of agricultural income derived and the export based commodities.

Table - 8 gives the distribution of important crops in different tehsils of Wardha district in 1960-80.

Table - 8

Percentage Distribution of Important Crops to Gross Cropped area in Different Tahsils, 1960-80, Wardha District.

Distt./Tahsils	Cotton & Jowar		Pulses & Wheat		Other ground nuts (Sesaum rice, fruits,& vegetable)	
	1960	1980	1960	1980	1960	1980
District Wardha	70.03	76.00	24.78	16.00	5.19	8.00
Wardha tahsil	72.97	77.83	23.81	17.26	3.22	4.91
Arvil tahsil	78.18	76.81	35.38	21.28	7.82	7.91

As mentioned earlier, in 1980, cotton and jowar occupy more than 70 per cent of the total cropped area in the district, with a significant increase in the area under these crops particularly in the Hinganghat tehsil (14%).

A variety of pulses are grown in the district as kharif and rabi crops. The spatial distribution of crops on the basis of production and area for 1981 can be summarised as follows:

Tahsil	Cropping Pattern
Wardha	Cotton, jowar, pulses
Arvi	Groundnut and rice
Hinganghat	Wheat

This differential pattern of distribution of crops would mean a variation in the strategy for area development even with in a tehsil.

Spatial Pattern of Agricultural Production

To summarise, Wardha district basically functions as a service cum-agriculture district and about 80 per cent of the income originates from these two sector. Table 9 gives the percentage of income derived from agricutlure, manufacturing and service in the district as compared to Maharashtra state.

Table - 9

Sectoral composition of Wardha District, 1985
(percentage)

	Agriculture	Manufacturing	Services
Wardha District	38.16	19.86	41.98
Maharashtra State	31.90	26.58	41.52

A variety of food and non - food crops are grown in the district. Among food crops, jowar, wheat, rice, bajri, gram and tur occupy pride of place. Of the nonfood crops, cotton and groundnut are most important, the former occupying the largest acre age under any single crop in the whole district.

Wheat and jowar come next to cotton in importance. The production of wheat is found to be highest in Hinganghat tehsil

followed by Wardha tehsil though the area under the crop has decreased by 43.73 per cent and 21 per cent respectively in the past two decases. This is probably due to the availability of fertile land along the Wardha river in Hinganghat. Wheat is essentially a rabi or spring crop and grows well in heavy soils with good moisture-retaining capacity.

Jowar is a hardy plant and its growth varies environmently with the quality of soil. It grows well in medium to heavy soils. The production of jowar has increased in Wardha tehsil by 100 per cent in the past two decades though the area under the crop has been inreased by only 11 per cent. The area under the crop has also been increased by approximately 25 per cent in Arvi and Hinganghat, though the production remains second and third in rank from Wardha tehsil in the past two decades. Jowar production is also popular because the initial expenditure is much less than for wheat cultivaion and it does well in dry years.

Settlement Structure and Population Distribution

The settlement structure in the district has two distinct and important characteristics. One is the relatively even distribution of all the rural settlements, and secondly the average distance between settlements is also quite even. The measurement of the spatial pattern by a study of intra - district variations in the intersettlement distances as well as by nearest neighbourhood analysis as a measure of the pattern, reveals a tendency towards uniformity in distribution. This measure is represented by the 'R' value which is explained below:

$R = \frac{rA}{rE}$, rA and rE are actual and expected mean distances from each settlement with its nearest neighbour.

$rA = \frac{r}{N}$, where N is No. of settlements.

$rE = \frac{1}{2/\sqrt{P}}$, shere P is $\frac{\text{No. of settlements}}{\text{Total area}}$

r = average distance between two settlements in the district for the total settlements.

Table - 10

Spatial Pattern of Distribution of Settlements:
Nearest Neighbourhood Analysis, 1987, Wardha District

Tehsils	Total area in sq.km.	Total no. of of settlements	rA	$\frac{}{\sqrt{P}}$	rE	R value
Wardha	812.02	466	1.6	0.76	0.66	2.42
Arvi	890.00	492	1.4	0.74	0.68	2.06
Hinganghat	729.00	413	1.4	0.75	0.67	2.09
Wardha Distt.	2434.02	1371	1.5	0.75	0.67	2.24

The 'R' value varies from 2.06 in Arvi tehsil to 2.42 in Wardha tahsil. These differences can be explained by differences in topographical conditions and land productivity.

Pattern of Spatial Distribution of Settlements

According to the 1981 census, there are 1015 inhabited villages in the district. Of this 250 (24.63%) have less than 200 population, 293 (28.87%) fall in the size class of 200-499, 416 (40.98%) have populations between 500-1999. The remaining 47 (4.63%) and 9 (0.89%) fall in the population ranges of 2000-4999 and 5000-9999 respectively, (Table - 11).

Table - 11

Tahsil-Wise Distribution of Settlements 1981, Wardha District

Category	Wardha tehsil		% to total	Arvi tehsil		% to total	Hinganghat tehsil		% to total	Wardha Distt.		% to total
	No.of set-tlement	Popu-lation		No.of set-tlement	Popu-lation		No.of set-tlement	Popu-lation		No.of set-tlement	Popu-lation	
< 200	82	4259	1.5	115	6537	3	53	4968	2.56	250	15764	2.76
200-499	84	28744	10	94	31658	14.51	115	39955	20.63	293	100357	14.43
500-999	97	67101	23.67	82	56979	26.12	77	52585	27.16	256	176665	25.41
1000-1999	64	83068	29.30	52	68304	31.32	44	57011	29.45	160	208383	29.97
2000-2500	6	13064	4.6	7	15340	7	6	13462	6.9	19	41866	6.02
2500-2699	3	8078	2.84	1	2511	1.15	3	7666	3.96	7	18255	2.62
2700-2999	2	5697	2.0	2	5738	2.63	-	-	-	4	11435	1.64
3000-3499	3	9352	3.79	5	16207	7.43	-	-	-	8	25559	3.67
3500-4499	4	15182	5.36	-	-	-	3	11396	5.88	7	6578	3.82
4500-6799	5	25903	9.13	1	6745	3.09	1	6542	3.37	7	39190	5.63
> 6800	3	23006	8.11	1	8050	3.69	-	-	-4	31056	4.46	
Total	353	283454		3560	218069		302	193585		1015	695108	

Source: District Census Hard Book, Wardha District, 1981.

There is, however, no village in the district with a population of 10,000 or more.

The spatial distribution of the rural population indicates maximum concentration (40.77%) in Wardha tahsil followed by Arvi (31.3%) and Hinganghat (27.78%). However, the number of rural settlements in Arvi tahsil are found to be higher than in Wardha tehsil with maximum concentration in the settlements with a population below 2000 persons.

The category-wise distribution of population shows that the maximum concentration of rural population in the settlements of less than 2000 population is found in Hinganghat tahsil (77%) followed by Arvi (71.95%) and Wardha (62.97%). A similar pattern follows in the distribution of rural settlements having less than 2000 population with maximum concentration in Hinganghat and Arvi tahsil (95%) each and Wardha tahsil (92%). It can be inferred therefore that about 62 - 77 per cent of the rural population is distributed in 92-95 per cent of the rural settlements of less than 2000 persons which mean that only 5 to 8 per cent of the rural settlements with populations above 2000 constitute about 23 to 38 per cent of the total rural population in the district.

The district has six towns with four towns in Wardha tahsil and one each in Arvi and Hinganghat tahsils. The population of the these towns in Wardha district is shown in Table - 12.

Population Growth and Density

The population of the district, according to the 1981 census, stands at 926,618 persons with decennial growth rate of 18.86 per cent during 1971-81. For the same period, Maharashtra has registered a growth rate of 24.54 per cent. The lower growth rate, of the district may be due to the male selective out migration to the neighbouring Nagpur district which has more lucrative job opportunities to offer because of its wider industrial and commercial base. Of the three tahsils of the district Hinganghat experienced the highest growth rate of 24.61 per cent while Arvi had the lowest of 14.42 per cent. The tahsil wise growth rate during 1971-81 is given in Table - 13.

As coincidence would have it, the growth rates of the district and of Wardha tahsil have turned out to be the same. The rural-urban differentials in the growth rate reveal that while the urban growth rate in the district has been of the order of 21.14 per cent, the rural rate of growth has been 18.12 per cent. In the Wardha tahsil, the rural growth rate (19.54%) has been higher than the urban (17.51%). As against this, both Arvi and Hinganghat have revealed higher urban growth rates.

Table - 12

Villages by Population Size - 1981, Wardha District

Sl. No.	Tahsils	Total rural pop.	Total no.of villages(inhabited	< 2000		2000-2500		2500-2699		2700-2999		3000-3499		3500-4499		4500-6799		> 6800	
				No.of settlement	Population	No.of settlement	Population	No.of settlement	Population	No.of settlement	Population	No.of settlement	Population	No.of settlement	Population	No.of settlement	Population	No.of settlement	population
1.	Wardha	283454 (40.77)	353	333	196236	3	8078	2	5697	3	9352	4	15182	5	25903	3	23006		
2.	Arvi	218069 (31.3)	360	350	178818	1	2511	2	5738	5	16207	-	-	1	6745	1	8050		
3.	Hinganghat	193585 (27.78)	302	295	167981	3	7666	-	-	-	-	3	11396	1	6542	-	-		
District (R)		695108	1015	978	543035	7	18255	4	11435	8	25559	7	26578	7	39190	4	31056		

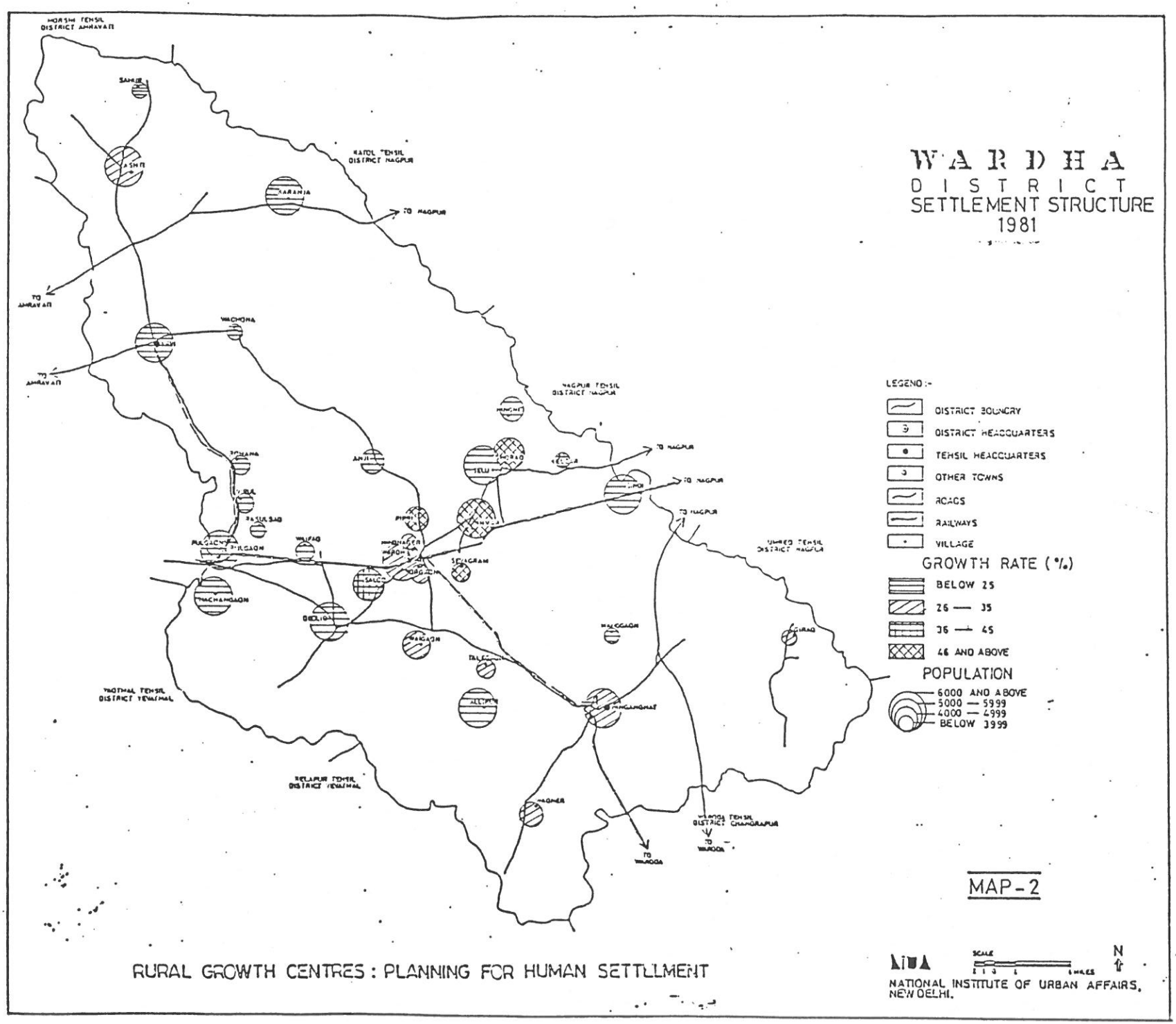
Contd...

Sl. No.	Tahsils	Total urban population	Total no. of towns	< 10,000		10,000-19,999		20,000-49,999		> 50,000	
				No. of settle-ment	Popula-tion	No. of settle-ment	Popula-tion	No. of settle-ment	Popula-tion	No. of settle-ment	Popula-tion
1.	Wardha	141316	4	1	9897	1	11566	1	31358	1	88495
2.	Arvi	31119	1	-	-	-	-	1	31119	-	-
3.	Hinganghat	59075	1	-	-	-	-	-	-	1	59075
	Urban	231510	6	1	9897	1	11566	2	62477	2	147570

Table - 13

Decadal Change in Distribution of Population, Wardha District

Sl. No.	Tahsil	1971			1981			Percentage decadal (1971-81) variation		
		Total	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban
1.	Wardha	357376	237117	120259	424770	283454	141316	+18.86	+19.54	+17.51
2.	Arvi	217783	191289	26494	249188	218069	31119	+14.42	+14.00	+17.46
3.	Hinganghat	204403	160054	44349	252660	193585	59075	+23.61	+20.95	+33.20
District Total		779562	588460	191102	926618	695108	231510	+18.12	+18.12	+21.14


WARDHA
DISTRICT
SETTLEMENT STRUCTURE
1981
LEGEND :-
DISTRICT BOUNDRY
DISTRICT HEADQUARTERS
TEHSIL HEADQUARTERS
OTHER TOWNS
ROADS
RAILWAYS
VILLAGE
GROWTH RATE (%)
BELOW 25
26 — 35
36 — 45
46 AND ABOVE
POPULATION
6000 AND ABOVE
5000 — 5999
4000 — 4999
BELOW 3999
MAP-2
RURAL GROWTH CENTRES : PLANNING FOR HUMAN SETTLMENT
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From as early as 1901 right up to the year 1961 there have been sharp fluctuations in the rate of growth in the district. It was insignificant for the decades 1931-41 and 1941-51. In the following decade 1951-61 the district population showed a sudden rise and reached a growth rate of 17.70 per cent. This significant increase in the growth rate during the decade appears to be the result of control of epidemics and other diseases since 1950. The highest ever rate of growth has, however, been found in the decade 1961-71. This has been of the order of 22.91 per cent. The increase during this decade has been more than five points. This may again be due to better medical facilities resulting in a higher survival rate. The decade 1971-81, however, reveals a decline in the growth rate (18.86%). As regards urban growth rate since independence, it was highest (27.39%) during the 1961-71 decade.

Table - 14

Growth, Density of Urban Population in Wardha District

Census year	Total population	Urban population	% of urban population	Decadal % variation in urban population	Density (population/ sq.km.)
1951	538903	128852	23.35	+25.36	N.A.
1961	634277	150015	23.65	+19.20	3125
1971	779562	191102	24.51	+27.39	6461
1981	926618	231510	24.98	+21.14	7784

Source: District Census Handbook, Wardha District, 1981, Part XIII,11.

The urban growth rate declined (21.14%) in the decade 1971-81. In the same decade from amongst the six towns of the district the highest growth rate (33.20%) has been observed in Hinganghat. Other towns in order of their rate of growth are Wardha (28.18%), Deoli (21.64%), Sindi (18.78%), and Arvi (17.46%). (Map : 2)

In the urban areas the highest density of 11,745 persons per km^2 has been found in Pulgaon town. Wardha town ranks second with a density of 11,389 persons per km^2. In respect of other towns it ranges between 1,410 and 9,848 persons per km^2. Since 1951 the density of population in the district has been increasing. A sporadic leap ahead in observed in 1971. Against an urban density of 3,125 persons per km^2 of 1961, there were 6,461 persons per km^2 in 1971 indicating, more than 100 per cent increase. However, the increase in 1981 has been modest, that is, 7,784 persons per km^2. At the state level the density has increased but the same has been of a steady nature. Against 1,694 persons per km^2 in 1961, it increased to 2,555 persons per km^2 in 1971 and to 3,736 perons per km^2 in 1981.

Twenty-six settlments of over 3000 persons forming a sample of 2.5 per cent of the total rural settlements have been identified for this case study.

The distribution of settlements in the district is given in Table 12 and their growth pattern in Table - 15.

As can be seen from Table 15 there is no significant relationship between population size and growth rate. It may be noted, however, that out of seven settlements in the category of 3500-4499, six are

Table - 15

Growth rate of Selected Settlements, Wardha District

Sl. No.	Village size	Frequency	Villages in each category									
			Neg-ative	Very low 0-10	Low 10-14.99	Low med. 15-24.99	Med. 25-34.99	High med. 35-44.99	High 45-59.99	Very high 60-99.99	Extremely high 100	Total
1.	3000-3499	8	-	4	1	1	1	1	-	-	-	8
2.	3500-4499	7	-	-	-	1	4	-	-	1	1	7
3.	4500-6799	7	-	-	2	2	1	1	-	1	-	7
4.	Above 6800	4	-	1	-	1	1	-	1	-	-	4
	Total	26		5	3	5	7	2	1	2	1	26

experiencing a growth rate from medium to high with one settlement in the extremely high category.

In the category of 4500-6799 four out of seven settlements show a growth rate from low to low-medium while two are in the category of medium to high medium. Settlements above 6800 are evenly distributed from very low to high categories.

Accessibility has brought change in the settlement structure not only in terms of population but in the location of various services and facilities. For example, Paunar, Ghorad and Salod have how become the nodal villages and have acquired centrality for the surrounding villages in this area.

The differential pattern of growth, accessibility and linkage pattern provide clues for the choice of settlements as nodal centres. An analysis of the central functions and centrality of settlement thus becomes necessary.

Hierarchy of Settlements and Central Functions

The hierarchy of settlement is based on their centrality. This can be described in terms of quality and quantity of central functions performed by the settlement. A central function is by nature, one that is available in a few settlements, yet being availed of by number of settlements. The quality of a central function can be affected by (i) the number of different types of services offered, and (ii) the level at which they are offered. The hierarchy of settlements is closely associated with the hierarchy of central functions. The latter can be determined by considering individual

central functions and by identifying their component parts. A central function is composed of many subfunctions and thus, within a particular central function it is possible to identify the different levels at which it is being performed.

The concept of centrality when applied to a predominantly rural area has to take note of, among other things, the population size of the place. This often serves as a proxy variable for many existing and potential functions. This is because the larger the population the greater is the present demand for services and also the greater the pull of the place to attract them over time. Table 16 brings out the threshold level of population for different services and functions in the study area.

Table - 16

Threshold Population of Each of the Functions, 1981, Wardha District

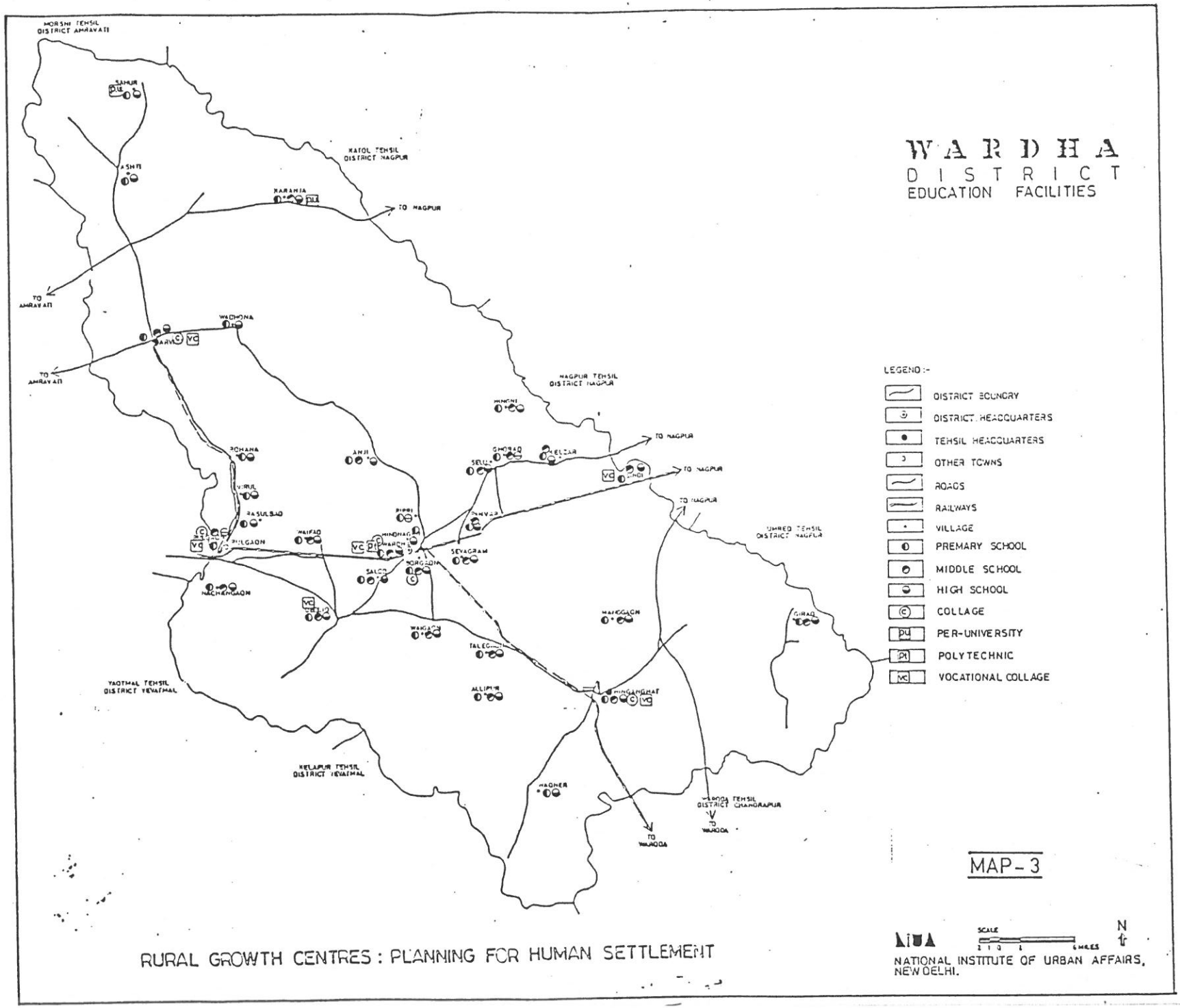
	Services and Aamenities	Threshold population and village	Minimum population and village
	EDUCATIONAL		
1.	Middle school	335 Dhamangaon	46 Arvi-Rural
2.	Higher secondary	-	31 Hinganghat-rural
3.	College	-	46 Arvi-rural
	MEDICAL		
4.	PHC+D+PHS	508 Dattarpur	21 Sahapur
5.	Maternity+CWS+FPC	584 Juwadi	46 Arvi-rural
6.	Tap water	156 Chichala	21 Sahapur
7.	Post Office	441 Madni	31 Hinganghat-rural
8.	Telephone connection	584 Wai Kolan Pod	46 Arvi-rural

Pattern of Distribution of Selected Services and Amenities: Education

Educational facilities are available in 796 of the 1015 inhabited villages encompassing a rural population of 679,568 persons. In other words, this amenity covers 78.42 per cent of the villages and 97.76 per cent of the rural population of the district.

Of the three tahsils of the district Hinganghat leads with 269 villages out of its 302 providing this facility from which 98.52 per cent of its rural population benefits. The proportion of villages having this facility in respect of Wardha and Arvi tahsils respectively stands at 75.64 per cent and 72.22 per cent.(Map : 3) The corresponding proportion of population covered in each are 97.75 per cent and 97.12 per cent. Three hundred and twenty eight villages with educational facilities have a population of less than 500 each. Against this there are nine villages each with population of more than 5000. The remaining 412 and 47 fall in the population ranges of 500-1999 and 2000-4999 respectively. There are 219 villages that do not have this amenity at all. The inhabitants of 171 have to walk distances of up to 5 km. to reach nearby schools; inhabitants of another 30 villages have to cover distances of between 5 and 10 km. to reach a school. Inhabitants of yet another 18 villages have to tread distances of more than 10 km. to avail themselves of this amenity.

In so far as the urban areas are concerned the population to institution ratios are 10,000:1.34 Higher Secondary/Inter/PUC Junior College; 10,000:1.30 Secondary/Matriculation school; 10,000:1.30 Junior Secondary/Middle School and 10,000:4.10 Primary School. To make it more understandable it may be said that there is a Higher



RURAL GROWTH CENTRES : PLANNING FOR HUMAN SETTLEMENT

Secondary/Inter/PUC/Jr. College for every 7,468 persons; a Secondary/ Matriculation School for every, 7,717 persons; a Jr.Secondary/Middle School for every 7,717 persons and a Primary School for every 2,437 persons in the urban areas of the district.

Table - 17

Distribution of Villages According to Availability of Amenities, Wardha District

Tahsil	No.of inhabited villages	No. (with%) of villages having one or more of the following amenities							
		Educational	Medical	Drinking water	P&T	Market/ hat	Communications	Approach by pucca road	Power supply
1. Wardha	353	267 (75.64)	36 (10.20)	353 (100)	88 (24.93)	54 (15.30)	124 (35.13)	171 (48.44)	307 (86.97)
2. Arvi	360	260 (72.22)	85 (23.61)	360 (100)	61 (16.94)	72 (20.00)	139 (38.61)	146 (40.56)	269 (74.72)
3. Hinganghat	302	269 (89.07)	30 (9.93)	302 (100)	43 (14.24)	38 (12.58)	95 (31.46)	94 (31.13)	153 (50.66)
Total of all tahsils	1015	796 (78.42)	151 (14.88)	1015 (100)	192 (18.92)	164 (16.16)	358 (35.27)	411 (40.49)	729 (71.82)

Medical Facilities

The medical facilities in the district are very inadequate. Barely 151 villages (14.88%) have any medical facilities for a rural population of 275,547. In Wardha tahsil, the district headquarter, 36 villages out of the 353 inhabited villages have medical facilities. The situation in Hinganghat tahsil is even worse with only 30 out of a total of 302 villages being provided with these amenities. Arvi tahsil, however has done better with 85 out of 360 villages (23.61%)

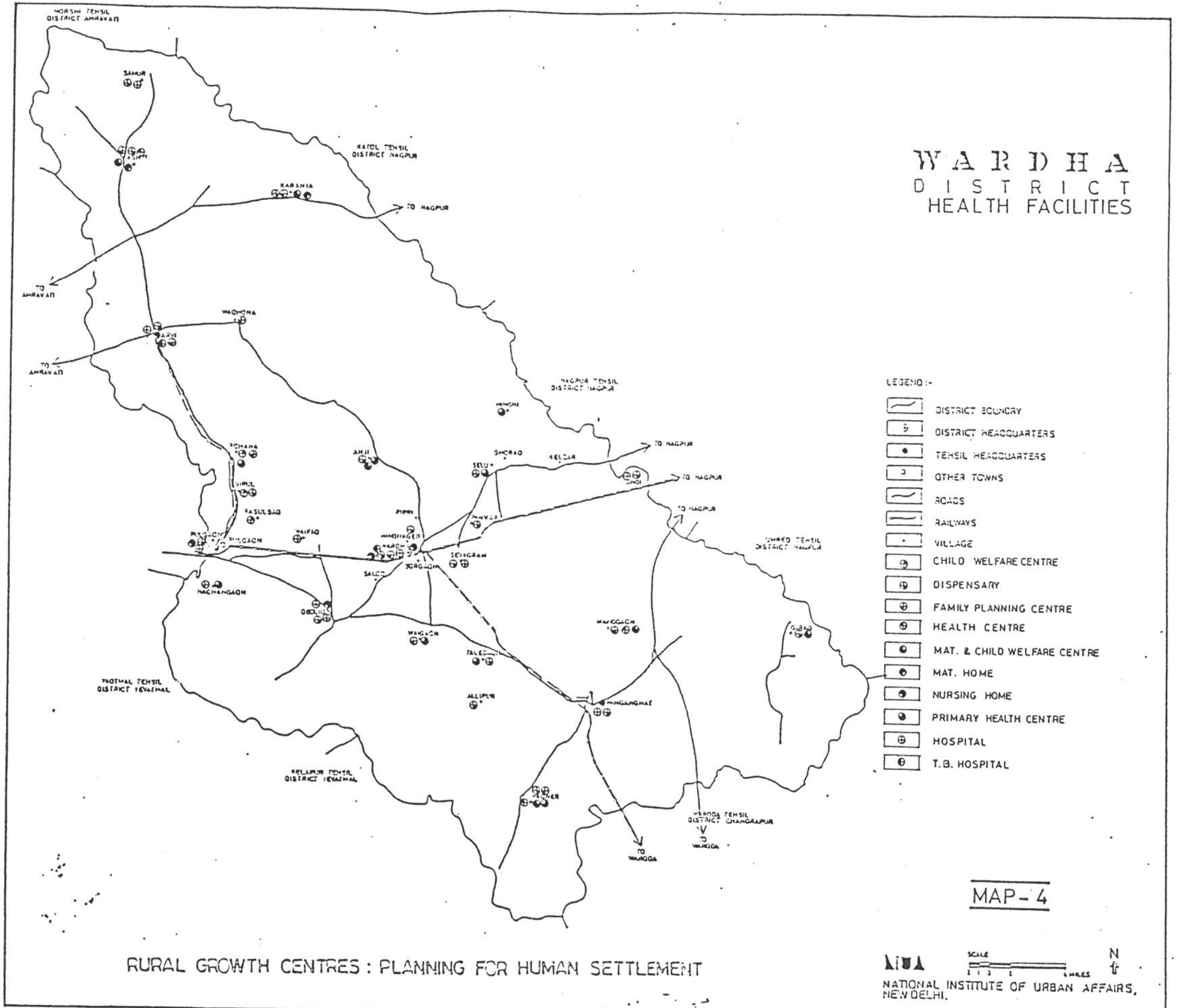
having medical facilities, thus benefiting 55.03 per cent of its rural population. (Map : 4) Eight of the total villages in the district have a population of 5000 or more. The remaining fall with the two categories of 500-1999 and 2000-4999 with 90 villages in the one and 37 villages in the other. Taking the villages lacking in medical facilities as a whole we find that the inhabitants of 418 villages have access to medical facilities within a radius of five kilometers. With the other 313 villages, however, we find that the inhabitants have to walk more than 10 km. in order to obtain medical facilities. Compared to this, in urban areas 2.39 beds are available for a population of 1000. This works out to one bed for every 418 urban people. In Wardha town however, the position is slightly better than in other areas since there is a bed for every 243 persons.

Drinking Water

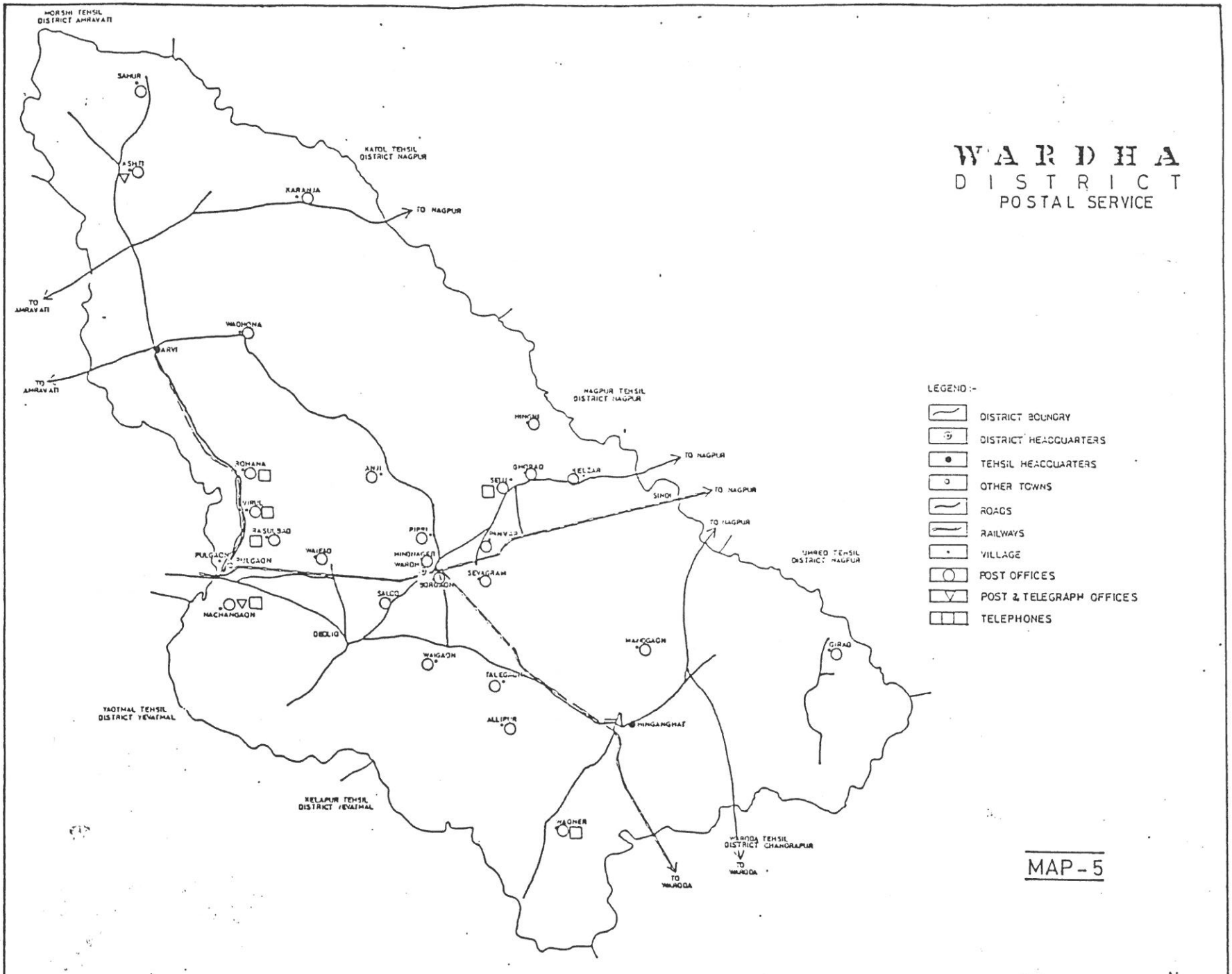
All the villages in the district have been provided with facilities for drinking water.

Posts and Telegraphs

Postal and telegraph amenities are available in 192 villages (18.92%). Of these 88 fall in Wardha tahsil and the remaining are dividedno61 and 43 falling in Arvi and Hinganghat respectively. The amenity covers 50.10 per cent of the rural population of the district. In Wardha tahsil the facility caters to 60.17 per cent of its population. In respect of other tahsils, namely Arvi and Hinganghat, the coverage of population is 49.17 per cent and 36.41 per cent respectively. (Map : 5)



WARDHA
DISTRICT
HEALTH FACILITIES
MORSHI TEHSIL DISTRICT AMRAVATI
KATOL TEHSIL DISTRICT NAGPUR
NAGPUR TEHSIL DISTRICT NAGPUR
UMRED TEHSIL DISTRICT NAGPUR
WARORA TEHSIL DISTRICT CHANDRAPUR
YEOTMAL TEHSIL DISTRICT YEVATMAL
RALAPUR TEHSIL DISTRICT YEVATMAL
SAHUR
KARANJA
TO NAGPUR
TO AMRAVATI
WADHONA
ARVI
ROHANA
VIRUL
RASULBAD
PULGAON
WAIFAD
ANJI
PIPRI
HINGNI
SELU
KELZAR
SINDI
SEVAGRAM
SALOD
NACHANGAON
DEOLI
WAIGAON
TALEGAON
ALLIPUR
HINGANGHAT
MANDGAON
GIRAD
TO WARODA
LEGEND :-
DISTRICT BOUNDARY
DISTRICT HEADQUARTERS
TEHSIL HEADQUARTERS
OTHER TOWNS
ROADS
RAILWAYS
VILLAGE
CHILD WELFARE CENTRE
DISPENSARY
FAMILY PLANNING CENTRE
HEALTH CENTRE
MAT. & CHILD WELFARE CENTRE
MAT. HOME
NURSING HOME
PRIMARY HEALTH CENTRE
HOSPITAL
T.B. HOSPITAL
MAP-4
RURAL GROWTH CENTRES : PLANNING FOR HUMAN SETTLEMENT
NIUA
SCALE
MILES
N
NATIONAL INSTITUTE OF URBAN AFFAIRS, NEW DELHI.



WARDHA
DISTRICT
POSTAL SERVICE

LEGEND :-

- DISTRICT BOUNDRY
- DISTRICT HEADQUARTERS
- TEHSIL HEADQUARTERS
- OTHER TOWNS
- ROADS
- RAILWAYS
- VILLAGE
- POST OFFICES
- POST & TELEGRAPH OFFICES
- TELEPHONES

MAP - 5

RURAL GROWTH CENTRES : PLANNING FOR HUMAN SETTLEMENT

SCALE
2 1 0 1 2 MILES

N

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From amongst the 192 villages with posts and telegraphs facilities six have a population less than 500 while another nine have 5000 or more inhabitants. The remaining 131 and 46 fall in the population size class of 500-1999 and 2000-4000 respectively.

Eight hundred and twenty-three villages do not have this amenity. The inhabitants of 569 villages can obtain it within a redius of five km. whereas those from 206 villages have to travel a distance of 5-10 km. in search of the same. There are yet another 40 villages whose inhabitants have to walk a distance of more than 10 km. to avail themselves of this amenity.

Market/Hat

Markets/hats for the sale and purchase of goods and commodities are held in 164 villages (16.16%) of the district for the benefit of 39.12 per cent of the district's rural population. Arvi tahsil leads with markets/hats being held in 72 of its 360 villages. In Wardha and Hinganghat such markets are organised in 54 and 38 villages respectively. In Arvi tahsil 48.57 per cent of its population are benefited by such markets/hats.

The proportions of the population covered by such markets/hats stand respectively at 36.18 per cent and 32.77 per cent.

Of the villages having this amenity, 21 have less than 500 population. On the other hand seven villages contain a population of 5000 or more. Another 98 and 38 villages fall in the population range of 500-1999 and 2000-4999 respectively.

Eight hundred and fifty-one villages do not have this amenity; out of these the people of 453 villages have such markets/hats within a radius of 5 km. Three hundred and two villages have them at a distance of 5-10 km. and another 96 villages have such markets/hat at a distance of over 10 km.

Communications

Communication facilities are available in 358 villages (35.27%) of the district and cater to 60.21 per cent of the district's rural population. These facilities include bus stops, a railway station and waterways within the village. Arvi tahsil leads in communication amenities available to 62.92 per cent of its rural population, followed by Wardha tahsil with 62.62 per cent of its population enjoying the amenity within its villages.

From the 358 villages having communication facilities, 107 have less than 500 population whereas nine villages have 5000 or more population. The remaining 197 and 45 fall in the population ranges of 500-1999 and 1000-4999 respectively.

Six hundred and fifty-seven villages do not have any communication facilities while 392 have the same available within a radius of 5 km. One hundred and ninety-five have them at a distance of 5-10 km. while another 70 have them at a distance of more than 10 km.

Approach by Pucca Road

Four hundred and eleven villages constituting 40.49 per cent of all the villages in the district are connected by pucca roads. Of these 171 fall in Wardha tahsil and the remaining 146 and 94 belong to Arvi and Hinganghat tahsils respectively. The population covered by these roads, works out to six out of ten persons of the district. The largerst network of such roads whereby seven out of the ten persons and benefited has been found in Wardha tahsil. Similar proportions in respect of Arvi and Hinganghat tahsil stand respectively at about six and about five out of ten persons.

From amongst the 411 villages having the pucca roads, 152 have a population of less than 500 persons; whereas 9 have 5000 or more. 207 have a population between 500-1999. The remaining 43 fall in the population range of 2000-4999.

Power Supply

Seven hundred and twenty nine villages (71.82%) of the district comprising 88.09 per cent of its population have provided with eletricity. Within the Wardha district 307 of the 353 villages have the benefits of electricity. Two hundred and sixty-nine out of 360 (about three-fourths) and 153 out of 302 (about one-half) villages of Arvi and Hinganghat tahsils respectively have been provided with electricity. Of the electrified villages in the district 310 have less than 500 population and nine comprise a population of 5000 or more. Three hundred and sixty-three and 47 fall in the population ranges 500-1999 and 2000-4999 respectively.

To sum up, villages which do not have any amenities (except drinking water) are 81 in number. The tahsilwise break-up of these villages is Wardha 29, Arvi 33 and Hinganghat 19. Two hundred and ninteen villages are without schools; 864 villages one devoid of medical facilities; 823 villages do not have postal facilities there are no markets/hats in 851 villages; 657 villages manage without bus stop, railway stations or waterways; 604 villages are not approachable through pucca roads and 286 villages do not have electricity. The situation is certainly not a happy one. A positive relationship between the size of the village and amenity provided can be observed.

The analysis of the selected settlements in terms of population size and the pattern of distribution of services and facilities for the formation of central places and their spatial pattern of distribution in the study area brings out the fact that there are only two settlements that have more than eight functions (Ashta and Karanja).

Only five of these settlements have five or more functions. Among eight settlements in the population range of 3000-3499, only two of them have the same level of functions as the large settlements in the population range of 3500-4499. The spatial pattern of distribution of settlements having three or four functions out of eight functions reveals the fact that a large number of centres of this category are located away from main roads while settlements with five or more than five functions are either on the main roads or just a little away from axial roads. The relative importance of large settlements with transport accessibility helps the emergence of such settlements as nodal centres. Their population range and distance

from the major cluster of functions and accessibility seems to have influenced the process of clustering of functions.

Table - 18

Variations in the Availability of Different Types of Services and Facilities in the Selected Settlements, Wardha District

Settlement size	Total no. of services and facilities available in individual villages													
	12	11	10	9	8	7	6	5	4	3	2	1	Nil	Total
3000-3499	-	-	-	-	-	-	-	-	2	6	-	-	-	8
3500-4499	-	-	-	-	-	-	-	2	2	3	-	-	-	7
4500-6799	-	-	-	-	1	-	1	2	3	1	-	-	-	8
Above 6800	-	-	-	-	1	1	1	1	-	-	-	-	-	4
Total	-	-	-	-	2	1	2	5	7	10	-	-	-	27

Total number of services & facilities considered:

1. Educational 2. Medical 3. Postal 4. Bank 5. Fertiliser Depot
6. Veterinary Hospital 7. Agricultural Extension Office
8. Regular Bust Stop

Measurement of Central Function

It is proposed that the levels of functional hierarchy should be given numerical values on he basisof their relative importance. For example, if there is one primary school in a village, it will get say 'one point'. As against this, if Wardha has 30 primary schools it will get 30 points. The next higher level, a secondary school is awarded avalue of 1 plus 1 and the third, 1 plus 1, and so on. The numerical value of that level will be multiplied by the quantity of that function at that level, in order to arrive at the centrality of

that settlement as far as the function is concerned. It is strictly understood that the low level of functional hierarchy rests under the influence of the next higher level.

The centrality of settlements in the Wardha district was determined on the basis of weightages. The functional hierarchy derived after giving due weightages are given in Table 19.

Table - 19

Functional Hierarchy of Settlements, Wardha District

Population	10-20	20-30	30-45	45-100	100-200	200
3000-3499	Rasulbad (A) Wadhona (A) Virul (A) Sahur (A) Kelzar (W) Rohna (A) Waifad (W) Talegaon (A)	-	-	-	-	-
3500-4499	Pipri (W) Sevagram (W) Hindnagar (W) Borgaon (W) Girad (H)	Mandgaon (H) Wadner (H)	-	-	-	-
4500-6779	Ghorad (W) Salod (W) Waigaon (W)	Hingin (W)	Anji (W) Allipur (W)	Karanja (A)	-	-
More than 6800	Pavnar (W)	Nachen-gaon (W)	Selu (W)	Ashti (A)	-	-
Towns				Sindi (WT) Deoli (WT)	Pul-gaon (WT)	Arvi (T) Hinganghat (T) Wardha (T)

Pattern of Classification of Settlements

While population size is important in providing services and facilities there is need for a rational policy for their spatial distribution because in the Indian context the number of villages of different size classes at any time requiring these facilities would far exceed the actual provision of plan allocation. There is also a spatial iregularity in the distribution of settlements of different size. Morever, the small industrial establishments and services in the rural areas hardly generate non-agricultural occupation which would be reflected in the overal pattern of occupation. Thus there is a strong case for the formulation of spatial development strategy which would integrate the social and economic aspects of development. It is in this context that the ranking of settlements has an operational significance.

Table 20 brings out the salient features of the arangement of settlements into a minimum of four classes. The classification is based on the gaps in the composite score. The frequency distribution of setlements also brings out the underlying pattern of relationship between population size and the composite rank.

i. Wardha stands out as the first ranking settlement and the functional gap between Wardha and the 2nd, 3rd and 4th order settlements is very wide. Even as the urban settlement Wardha is a class II town as against the two other towns falling in the third and fourth order settlements in the Wardha tahsil (Pulgaon & Deoli).

ii. Settlements of the second, third and fourth orders are very few (1 to 4). The two towns mentioned above belong to these levels along with the two large-sized rural settlements Ashti and Karanja. Ashti with 8000 persons in 1981 is functionally as important as the town of Sindi. Karanja with 6700 persons has emerged by far the only important settlement in the Arvi tahsil with a third rank.

iii. There are several instances where the settlements are large enough in terms of population and yet functionally their rank is low, for example, Paunar, Ghorad, Salod in Wardha tahsil. Situated away from radial routes converging on Wardha explains the low level of these settlements.

iv. On the whole, the structure of the settlements ranking brings out a high degree of imbalance with very few villages acquiring services, facilties and functions to emerge as nodal centres. Such a situation reflects a weak functional organisation of rural settlements within and the dominance of Wardha as the major regional node.

Settlement Hierarchy

The regional setting, the settlement structure, the spatial pattern of distribution and the ranking of settlements provide some clues to the existing pattern of settlement hierarchy and the space relations. Just as a large sized village need not necessarily have a higher rank on the basis of composite function, all settlements of higher rank might not attain a higher level in the settlement hierarchy. Here the concept of hierarchy is a dynamic one; and the different levels of settlements hierarchy would reflect different levels of nodality expressed through the convergence of people and goods in different places. For this purpose the map of bus frequency is used in the first instance in order to analyse the pattern of space relations and identification of major and subordinate nodes.

The identification of nodes is done on the basis of the following principles :

i. A nodal centre of a higher order is one whose largest flow is to a smaller or a subordinate node. likewise, a subordinate node is one whose largest flow is to a larger centre. The size of a place can be established on the basis of population size and/or the functions and so forth.

ii. The largest flow from each of the centres can be identified from the total number of buses orginating from a place as well as the number of buses touching places on the routes.

iii. The total number of inward flows to each centre is calculated by adding all the column totals.

iv. Largest flows from centres to smaller centres whose inward flow is small are also identified.

The pattern of space relation is one of the dominance of Nagpur within which Wardha has its own individuality as the highest or first order settlement in the study area. At the second level Amravati, Kalaneb and Tiwasa are important. These are outside the district, which mean that northern and south-eastern settlements are fuctionally oriented to these centres for most of their transanctions. This was brought out in the local enquiry in sample villages in which information was collected for the consumer behaviour and trave pattern. Distance and pattern of linkages to different nodal centres also reflect the above analysis. Yavatmal and Amravati have the same level as Wardha.

The centres at the third level are Arvi, Deoli, Hinganghat, Selu, Pulgaon and Telegoan.

A comparison of the broad patterns of nodality and ranks, therefore, brings out the fact that except for Wardha and to some extent, Arvi, none of the settlements in the various ranks has acquired the fuctional level adequate for creating a tributary of its own.

Local enquiry revealed that Deoli, Talegaon, Pulgaon, and Jamb have some degree of nodality, though weak in comparison relatively

with those of Nagpur and Yeotmal and others as mentioned above.

It appears that the major pattern of linkages of large settlements has influenced the pattern of the settlement hierarchy and there is a need for these to be integrated with the pattern of nodality which has to be created anew with respect to the agricultural landscape.

As mentioned earlier in selecting rural sites that have better than average prospects of becoming future agro-urban communities, two locational considerations arise. What should be the characteristics of the region in which such a growth point will be sought, and, secondly, what special features should a particular site within a region possess? Since geographic, agronomic, and ethnographic factors will influence the choice of both region and site, it is not easy to isolate general determinants. Because the function of the emergent rural growth centre is to bring country-dwelling people into a market economy in a more complete and truly functional way, the growth potential of any chosen site will perforce depend on the productive capacity of the region in which it is located, for the very obvious reason that in an agrarian economy the future prospects of a market centre will depend on its capacity to assemble or process crops that are important not only to the local area but to the entire economy. The first criterion for evaluating a region will therefore, be its present crop-prducing performance, the second, its potential future productive capacities.

Bennett Harrison has suggested that these two crop "indicators" can be used in conjunction with an index of regional rural population

density to determine the relative promise of regions as areas in which to seek suitable sites for fural growth centres.

The thrust of the emergent "rural growth centres" should be much more centripetal than centrifugal, looking toward the progressive development of places where trade, service, and some appropriate manufacturing facilities will be within access of agricultural hinterlands, thereby providing not only markets for farm products but employment for farm-born young people who prefer non farm occupations. This manpower criterion ought not be neglected in the selection of sites for rural growth centres.

Based on the indicators mentioned above, the field survey was conducted in the selected settlements through questionnaires. The analysis of the questionaires reveals the following:

i. The enquiry into travel patterns brings out a multiple pattern of contacts for various transanctions. The frequency of travel to the nearest available settlement is found to be more for purchase of items of daily need. The contacts are basically of two kind:

   - To travel frequently for purchase of the items of daily need to nearest available settlements

   - To travel once a week or so, to the higher order settlement for the sale of agricultural commodities and so on. These higher order settlements are generally located close to the district roads.

Therefore these place could act as central places. Further the pattern of nodalities have also been brought out by the analysis of bus frequency and the travel patterns by local enquiry.

ii. Here an attempt is being made to compute the functional hierarchy of settlements on the basis of -

   - production

   - density of population (rural), and

   - potentiality of the settlement.

The primary data collected through questionnaires were used to calculate the production and potentiality of the selected settlements. The functions were assigned different weightages depending upon their importance.

The factors of production included (a) mechanised irrigation; (b) use of modern agricultural inputs; and (c) crop productivity, while the factors of potentiality included (a) physical characteristics, that is distance from NH/SH/RS, tahsil HQ/Block HQ, (b) land, that is, soil fertility; (c) services and amenities, such as

- education, medical, shops, markets entertainment,
- number of dependent villages for various transactions, and
- financial institutions.

The hierarchy of settlements is arrived at by adding the weightage to make a composite score for production and potential functions of each settlement; and by combining the two with density of settlements, the final centrality score is calculated. This has been done with a view to compare and correlate it with the centrality score calculated earlier through the population growth rate, services and facilities available in each settlement. (Table - 20 (A))

Comparative analysis reveals that Selu and Anji with centrality scores between 30 and 45 constituting the third rank in services and facilities have a higher production and potential function and emerge in the second rank, while some of the settlements such as Alipur, Wanjan and Hinganghat which rank fourth in terms of services and facilities rank second in the centrality score computed by considering the production and potential functions of the settlements.

The enquiry also reveals the emerging pattern of nodality among lower order settlements in terms of agricultural production and potentiality. This means that there are discrete breaks or gaps in the settlements hierarcy not only among different ranks of settlement but also in the pattern of the functional organisations of the area. A spatial development strategy for the organisation of central places to cater to the needs of the changing agricultural landscape and the rural community assumes a priority in such a situation.

Table - 21

Centrality Score

Score	3000-3499	3500-4499	4500-6799	6800 above	No. of settle-ments
25-50	Rohna,Rasulbad Wadhona,Sahur	-	-	-	4
51-75	Virul,Talegaon, Velzar, Wanfad	Pipri,Girad, Hind Nagar, Borgaon, Mandgaon	Ghorad, Salod	Nachengaon Pavnar	13
76-100	-	Wadner, Sevagram	Karanja, Allipur, Hingri,Anji	Selu	8
101-125	-	-	-	Ashti	1
	8	7	7	4	26

Table - 20 (A)

Centrality Score

Sl. No.	Name of the settlement	Physical	Land	Social components & score	Components & production	Potentiality components score	Total production & potantiality	Density/ hac.
1.	2.	3.	4.	5.	6.	7.	8.	9.
1.	Nachengaon	6	10	27	13	43	56	6.09
2.	Ashti	7	10	66.7	24	83.7	107.7	3.82
3.	Paunar	9	10	19.7	25	38.7	63.7	4.61
1.								
4.	Selu	8	10	50.7	19.5	68.7	88.9	10.81
5.	Karanja	8	10	51.7	24	69.5	93.5	3.57
6.	Allipur	6.5	15	37.6	27.5	59.1	86.6	2.23
7.	Ghorad	10	10	12.4	26	32.4	58.4	5.18
8.	Salod	9	5	17.7	23	32.7	54.7	4.45
9.	Waigaon	5	15	36	24.5	56	80.5	3.95
10.	Hingain	7.5	10	35	27	52.7	78.5	8.17
11.	Anji	6	10	40.6	23.5	50.6	80.1	4.01
12.	Pipri	9	20	15.5	20.5	44.5	65	3.56
13.	Wadner	6.5	20	42.4	15	68.9	83.9	2.11
14.	Girad	4.5	10	29	9.5	43.5	53	2.24
15.	Hindnagar	12	10	15	21	37	58	5.20
16.	Borgaon	12	5	14.4	26	31.4	57.4	7.89
17.	Mandgaon	9	20	33	9.5	62	71.5	1.59
18.	Sevagram	8.5	5	40	24.5	53.5	78	5.54
19.	Rohna	8	10	19.5	12	37.5	49.5	7.22

Contd....

Table - 20 (A) (Contd.)

1. 2.	3.	4.	5.	6.	7.	8.	9.
20. Virul	7	10	19	24	36	60	3.16
21. Talegaon	4.5	10	22.3	27	36.8	63.8	2.12
22. Rrasulbad	8	10	14	6.5	32	38.5	2.97
23. Wadhona	6	10	20	10	36	46	3.76
24. Sahur	7	5	15.5	9	27.5	36.5	2.36
25. Kelzar	8	10	23.2	18.5	41.2	59.7	1.69
26. Weripord	5.5	10	18.7	24.5	34.2	58.7	1.56

CHAPTER III

DEWAS DISTRICT : MADHYA PRADESH

LOCATION AND PHYSICAL LANDSCAPE

The district of Dewas derives its name from the hill of Dewas, probably a contraction of devi-vasini, which stands close to the town. The district was constituted in the erstwhile state of Madhya Bharat by merging 242 villages of the two tahsils of Dewas of the former Senior and Junior states, 452 villages of Sonkatch tahsil of the former Gwalior State, 99 villages of Nimanpur tahsil of the former Dhar State, one village of Jawar tahsil of the former Bhopal state and the then existing tahsil of Kannod and Khategaon of the former Holkar state. The district is situated on the Malwa Plateau. It lies roughly between latitude 22^{o} and and 24^{0} N, longtiude 75^{0} and 77^{o} $1/2^{o}$. It is encircled by the borders of Indore, Ujjain, Shajapur, Sehore, Khategaon, Khandwa and Hoshangabad Districts.

The Vindhyas cross the district with hills standing from 300 feet to 500 feet above the surrounding plain. The main watershed is formed by the Vindhyan range from where all the streams flow northwards towards the Jumna-Ganga doab. Three main water systems are connected there with the Narmada, Sipra and the Kali-Sind respectively. The district has a moderate climate and receives an average annual rainfall of about 1086 m. The range of maximum and minimum temperatures of the towns varies from 32.4^{o} c to 17.5^{o} c (Table 21). The land for the most part is covered with rich and highly fertile black-cotton soil.

Table - 21

Physical Aspects, 1969, Dewas District

Town		Latitude/ Longtidue	Annual rainfall (in mm.)	Temperature (centigrade)	
				Max.	Min.
1.	Bagli	22° 39' 76°21'	1053.4	31.3*	17.5*
2.	Bhaurasa	23° 00' 76°12'	1053.4	31.3*	17.5*
3.	Dewas	22° 12'	1047.3	31.3*	17.5*
4.	Hatpiplaya	22° 47'	1053.4	31.3*	17.5*
5.	Kannod	22° 40'	1180.0	32.4+	20.0+
6.	Khategaon	22° 35'	1362.8	32.4+	20.0+
7.	Sonkatch	22° 59'	1021.8	31.3*	17.5*

* Relates to Indore city

\+ Relates to Hoshangabad Town

SOURCE : District Census Handbook, 1971.

Dewas district has a network of roads which connects the blocks, the towns and villages with the district headquarter and Dewas with the adjoining districts especially Indore, Ujjain and Sehore. Indore is the nearest city by road from all the towns. Indore, Dewas and Ujjain form a triangle. The distances between Indore-Ujjain and Dewas-Ujjain are 55 km , and 35 kms. respectively. Dewas, the district head quarter town is at a distance of 153 km. by road from the state head quarter (Table 22). The total length of roads in the district is 612 kms. Only about 13 per cent of the total villages in the district are connected by pucca roads (Table 23). The National Highway connecting Bombay and Agra passes through Dewas. Dewas is connected by broad gauge railway line with Indore and Ujjain. Its length in Dewas district is 64 kms. Because of a poor railway network most of the produce in the district has to move mostly by road transport. Block headquarters other than Dewas Block do not figure on the railway map. In the absence of the 1981 census for Dewas district, the data relates to the 1971 census except where information was obtained from the respective departments.

Agriculture

Nearly 79 per cent of the district's population derive their income from agriculture and around 63 per cent of the total income of the state originates from agriculture which is higher compared to the state and national level of the total area under cultivation. Cotton, jowar, wheat, gram and soyabean are important crops in addition to the important pulses grown.

Table - 22

Location of Towns, 1969, Dewas District

Town	Nearest city with pop. of 1 lakh or more	State H.Q.	Distt. H.Q.	Tahsil H.Q.	Railway Stn.	Bus Route
Bagli	Indore (56)	Bhopal (176)	Dewas (61)	Bagli (0)	Indore (56)	Bagli (0)
Bhaurasa	Indore (53)	Bhopal (135)	Dewas (18)	Sonkatch (16)	Dewas (18)	Bhaurasa (0)
Dewas	Indore (35)	Bhopal (153)	Dewas (0)	Dewas (0)	Dewas (0)	Dewas (0)
Hatpiplaya	Indore	Bhopal	Dewas	Bagli	Indore	Hatpiplaya
Kannod	Indore (96)	Bhopal (210)	Dewas (100)	Kannod (0)	Harda (54)	Kannod (0)
Khategaon	Indore (115)	Bhopal (229)	Dewas (119)	Khate-gaon (0)	Harda (37)	Khate-gaon (0)
Sonkatch	Indore (67)	Bhopal (121)	Dewas (32)9	Sonkatch (0)	Dewas (32)	Sonkatch (0)

Table - 23

Tahsilwise distribution of roads, 1969, Dewas District

Tahsil	Total No. of villages	No. of villages having pucca roads	Percentage
Sonkatch	245	17	6.94
Dewas	243	30	12.35
Bagli	310	38	12.26
Kannod	186	40	21.51
Khategaon	168	26	15.48
Total	1152	151	13.11

SOURCE : District Census Handbook, 1971

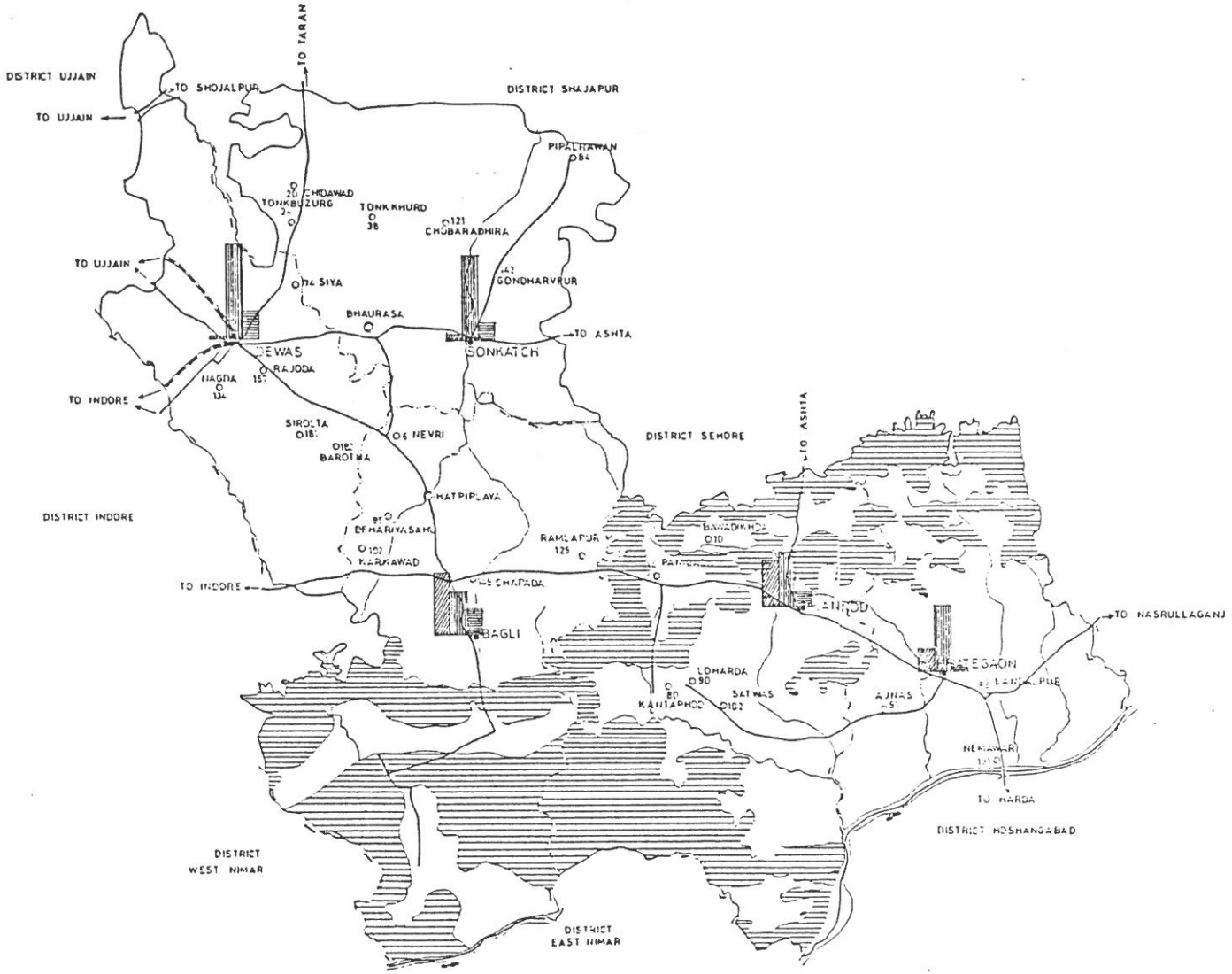
Regarding activities allied to agriculture, dairy farming needs special mention. It has developed substantialy, on account of special schemes initially sponsored by government to assist weaker sections of the society under IRDP. This activity provides additional income to small and marginal farmers, landless labourers and so forth.

Land Use Pattern

Table 24 presents the details of land utilization data for the years 1975-76, 1980-81, and 1983-84. About 26 per cent of the total area of the district is under forest and has more or less been constant over the years. The percentage of forest area, tahsilwise, is indicated in Table 25. It may be noted that there is comparatively more forest area in Bagli and Kannod tahsils while in Dewas and Sonkatch the percentage area is significantly less. To be precise Bagli has 49.65 per cent and Sonkatch has got 37.17 per cent of their areas under forest (Map 6).

It is evident from Table 26 that the net cropped area of Dewas district is about 52 per cent. Cropping intensisty of Dewas district was 107.213 in 1975-76 and has registered a steady increase growing up to 110.05 and 117.22 in 1980-81 and 1983-84 respectively. Among the tahsils Dewas shows the highest cropping intensity that is 115.02, whereas Khategaon shows the lowest as per the 1980-81 data. Cropping intensity however has increased in all the tahsils over the years as may be seen in Table 27.

DEWAS
DISTRICT
LAND UTILIZATION
(Tahsil wise)
ANALYSIS 83-84



LEGEND

- DISTRICT BOUNDARY
- TEHSIL BOUNDARY
- RESERVED FOREST
- RIVERS
- ROADS
- RAILWAYS
- DISTRICT HEADQUARTER
- TAHSIL HEADQUARTER
- TOWNS
- VILLAGES ABOVE 2000 POPULATION
- % OF FOREST AREA
- % OF NET AREA SOWN
- % OF NET IRRIGATED AREA
  - 100 %
  - 80 %
  - 60 %
  - 40 %
  - 20 %
  - 0 %

MAP - 6

RURAL GROWTH CENTRES : PLANNING FOR HUMAN SETTLEMENT

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Table - 24

Land Utilization in Dewas District

	Dewas District					
	1975-76	%	1980-81	%	1983-84	%
1. Total geographical area (sq.km.)	672309		672309		672309	
2. Forest area	174862	26.00	176047	26.19	176041	26.12
3. Barren and unculturable land	15676	2.33	14078	2.09	14616	2.17
4. Land put to non-agricultural uses	30640	4.56	31811	4.73	31769	4.73
5. Cultivable waste	21	0.003	18	0.003	19	0.003
6. Permanent pastures and grazing land	88509	13.16	89568	13.32	85960	12.79
7. Current fallows	2572	0.38	2446	0.36	2427	0.36
8. Other fallows	4524	0.67	3544	0.53	3321	0.49
9. Net area sown	345436	51.38	349254	51.95	353343	52.56
10. Area sown more than once	24975	3.71	35113	5.22	60831	9.05
11. Gross cropped area	370411	55.09	384367	57.17	414174	61.60
12. Cultivable land	10069	1.50	5543	0.82	4813	0.72

Contd....

Table - 24 (contd.)

Land Utilization in Dewas District

	Dewas Tehsil					
	1975-76	%	1980-81	%	1983-84	%
1. Total geographical area (sq.km.)	100492		100492		100492	
2. Forest area	503	0.50	726	0.72	726	0.72
3. Barren and unculturable land	2557	2.5	2417	2.41	2177	2.17
4. Land put to non-agricultural uses	5977	5.9	6413	6.38	6499	6.47
5. Cultivable waste	3	0.003	3	0.003	3	0.003
6. Permanent pastures and grazing land	12162	12.10	11647	11.59	11228	11.17
7. Current fallows	322	0.32	414	0.41	596	0.59
8. Other fallows	297	0.30	424	0.42	578	0.58
9. Net area sown	76813	76.44	77129	76.75	77179	76.80
10. Area sown more than once	8633	8.59	11585	11.53	20253	20.15
11. Gross cropped area	85446	85.02	88714	88.28	97432	96.95
12. Cultivable land	1858		1319	1.31	1506	1.50

Contd....

Table - 24 (contd.)

Land Utilization in Dewas District

		Bagli Tehsil					
		1975-76	%	1980-81	%	1983-84	%
1.	Total geographical area (sq.km.)	192495		192495		192495	
2.	Forest area	94672	49.18	95561	49.64	95565	49.65
3.	Barren and unculturable land	3233	1.68	3129	1.63	3531	1.83
4.	Land put to non-agricultural uses	5056	2.63	5116	2.66	5387	2.80
5.	Cultivable waste	-	-	-	-	-	-
6.	Permanent pastures and grazing land	18468	9.59	18960	9.85	17857	9.28
7.	Current fallows	377	0.20	365	0.19	251	0.13
8.	Other fallows	504	0.26	393	0.20	208	0.11
9.	Net area sown	67321	34.97	67744	35.19	68850	35.77
10.	Area sown more than once	8146	4.23	8434	4.38	16193	8.41
11.	Gross cropped area	75467	39.20	76178	39.57	85043	44.18
12.	Cultivable land	2864	1.49	1227	0.64	646	0.34

Contd....

Source: District Statistical Handbook, Dewas, M.P., 1976,1981,1984.

Table - 24 (contd.)

Land Utilization in Dewas District

		Kannod Tehsil					
		1975-76	%	1980-81	%	1983-84	%
1.	Total geographical area (sq.km.)	140509		140509		140509	
2.	Forest area	52188	37.14	52233	37.17	52225	37.17
3.	Barren and unculturable land	399	0.28	402	0.29	387	0.28
4.	Land put to non-agricultural uses	5623	4.00	5846	4.16	5673	4.04
5.	Cultivable waste	1	0.0007	1	0.0007	1	0.0007
6.	Permanent pastures and grazing land	18887	13.44	19041	13.55	17788	12.66
7.	Current fallows	843	0.60	618	0.44	487	0.35
8.	Other fallows	1437	1.02	1147	0.82	1075	0.77
9.	Net area sown	60912	43.35	61194	43.55	62834	44.72
10.	Area sown more than once	1579	1.12	5615	4.00	7708	5.49
11.	Gross cropped area	62491	44.47	66809	47.55	70542	50.20
12.	Cultivable land	219	0.16	27	0.02	339	0.24

Contd....

Table - 24 (contd.)

Land Utilization in Dewas District

	Khategaon Tehsil					
	1975-76	%	1980-81	%	1983-84	%
1. Total geographical area (sq.km.)	109941		109941		109941	
2. Forest area	20746	18.87	20764	18.89	6753	18.89
3. Barren and unculturable land	2149	1.95	2176	1.98	2144	1.95
4. Land put to non-agricultural uses	5956	5.42	5946	5.41	5936	5.40
5. Cultivable waste	5	0.005	5	0.005	5	0.005
6. Permanent pastures and grazing land	20324	18.49	20518	18.66	20968	19.07
7. Current fallows	630	0.57	642	0.58	639	0.58
8. Other fallows	1722	1.57	1019	0.93	904	0.82
9. Net area sown	55372	50.37	56501	51.39	56946	51.80
10. Area sown more than once	529	0.48	1475	1.34	1990	0.81
11. Gross cropped area	55901	50.85	57976	52.73	58936	53.11
12. Cultivable land	3037	2.76	2370	2.16	1635	1.49

Contd....

Table - 24 (contd.)

Land Utilization in Dewas District

	Sonkatch Tehsil					
	1975-76	%	1980-81	%	1983-84	%
1. Total geographical area (sq.km.)	128872		128872		128872	
2. Forest area	6753	5.24	6763	5.24	6761	5.25
3. Barren and unculturable land	7338	5.70	5954	4.62	6377	4.95
4. Land put to non-agricultural uses	8028	6.23	8490	6.59	8274	6.42
5. Cultivable waste	12	0.009	9	0.007	10	0.008
6. Permanent pastures and grazing land	18668	14.49	19402	15.06	18119	14.06
7. Current fallows	400	0.31	407	0.32	454	0.35
8. Other fallows	564	0.44	561	0.44	556	0.43
9. Net area sown	85018	65.97	86686	67.27	87534	67.92
10. Area sown more than once	6088	4.72	8004	6.21	14687	0.114
11. Gross cropped area	91106	70.69	94690	73.48	102221	79.32
12. Cultivable land	2091	1.62	600	0.47	787	0.61

Table - 25

Percentage Distribution of Forest Area, Dewas District

Distt./Tahsil	Year		
	1975-76	1980-81	1983-84
Dewas Distt.	26.00	26.19	26.18
Dewas Tahsil	0.50	0.72	0.72
Bagli Tahsil	49.18	49.64	49.65
Kannod Tahsil	37.14	37.17	37.17
Khategaon Tahsil	18.87	18.89	18.89
Sonkatch Tahsil	5.24	5.24	5.25

SOURCE : District Statistical Handbook.

Table - 26

Distribution of Net Cropped Area, Dewas District

Distt./Tahsil	% of Net Area Shown		
	1975-76	1980-81	1983-84
Dewas Distt.	51.38	51.98	52.56
Dewas Tahsil	76.44	76.75	76.80
Bagli Tahsil	34.97	35.19	35.77
Kannod Tahsil	43.35	43.55	44.72
Khategaon Tahsil	50.37	51.39	51.80
Sonkatch Tahsil	65.97	67.27	67.92

SOURCE : District Statistical Handbook.

Table - 27

Pattern of Cropping Intensity, Dewas (Tahsil-wise)

Distt./Tahsil	Cropping Intensity		
	1975-76	1980-81	1983-84
Dewas Distt.	10.23	110.05	117.22
Dewas Tahsil	111.22	115.02	126.24
Bagli Tahsil	112.10	112.45	123.52
kannod Tahsil	102.59	109.18	112.27
Khategaon Tahsil	100.96	102.61	103.49
Sonkatch Tahsil	107.16	109.23	116.78

SOURCE : District Statistical Handbook.

The net irrigated area of Dewas district has shown a steady rise as can be seen from Table 28. The percentage of net area irrigated to net area was 11.14 in 1980-81. According to the 1980-81 data it is highest in Dewas tahsil (16.00), the next being Bagli (15.26), whereas Khategaon tahsil registered the lowest of 2.51

The important crops grown in Dewas district are wheat, jowar, cotton and oilseeds. Among these, jowar accounts for almost 32 per cent of the total area, the largest area under one single crop. The pattern is more or less the same for the tahsils too. However, Table 29 shows a decline in the area under jowar and cotton over the years in the district as well as in the tahsils while the area under oilseeds shows a marked increase over the years. The increase is not pronounced in Dewas and Sonkatch tahsils especially from 1980-81.

The yield per hectare of important crops is presented in Table 30. The yield of jowar in Dewas district is found to be 798 kg. compared to 681 kg. in 1983-84 which is again higher than the state yield of 801 kg.

There has been a shift in activity in the agricultural sector. The agricultural economy is becoming more and more cash crop oriented. The area under cotton and jowar is being steadily replaced by soyabean. District-wise data reveal this shift in cropping pattern from 1980-81. The yield of jowar has also shown a marked decrease to 835 kg. in 1984-85 from 922 kg. In 1980-81 while the area under jowar has also decreased from 32.45 per cent to 23 per cent the district.

Table - 28
Percentage Distribution of Net Irrigated Area in Dewas District (Tahsil-wise)

Distt./Tahsil	% of net area irrigated to net area shown		
	1975-76	1980-81	1983-84
Dewas Distt.	6.3	11.14	15.13
Dewas Tahsil	8.80	16.00	21.63
Bagli Tahsil	10.61	15.26	21.92
Kannod Tahsil	4.42	10.21	12.53
Khategaon Tahsil	1.99	2.51	2.73
Sonkatch Tahsil	5.03	9.62	13.98

SOURCE : District Statistical Handbook.

Table - 29
Area Under Different Crops (District and Tahsil)

	Area Under Crops in Dewas District (hectares)							
	1975-76	%	1980-81	%	1983-84	%	1984-85	%
Rice	3396		2808	0.73	2076	0.50	2091	0.51
Wheat	60705		52687	13.70	57051	13.77	55144	13.45
Jowar	92812	25.06	124750	32.45	113527	27.41	94339	23.00
Corn	6495		9059	2.35	10054	2.43	12190	2.97
Other cereals	664		436	0.12	519	0.13	224	0.05
Pulses	78094		53634	13.95	64147	15.49	48724	11.88
Sugarcane	5060		6054	1.58	8173	1.97	7505	1.83
Other food crops	4275		4373	1.14	4086	0.99	4605	1.13
Oilseeds	30144	8.1	47903	12.46	69559	16.79	105748	25.78
Cotton	46575	12.57	38929	10.13	41633	10.05	36521	8.91
Other nonfood crops	42191		43764	11.39	43349	10.47	43026	10.49
Total area under crops	370411		384367	100.00	414174	100.00	410117	100.00

Table - 29 (contd.)

Area Under Different Crops (District and Tahsil), Dewas

(in hectares)

	Area Under Crops in Dewas Tehsil							
	1975-76	%	1980-81	%	1983-84	%	1984-85	%
Rice	181		162	0.18	113	0.12	71	0.07
Wheat	19740		18423	20.77	19962	20.49	18785	19.63
Jowar	19111	22.4	25721	29.00	21192	21.75	14944	15.62
Corn	1055		2064	2.33	2873	2.95	3353	3.50
Other cereals	69		21	0.02	19	0.01	7	0.01
Pulses	26148		16544	18.65	19445	19.96	12869	13.45
Sugarcane	1221		1405	1.58	1786	1.83	1435	1.50
Other food crops	1358		1663	1.87	1391	.43	1679	1.76
Oilseeds	6106	7.1	12910	14.55	21244	21.80	32920	34.40
Cotton	724	0.84	93	0.11	37	0.04	21	0.02
Other nonfood crops	9673		9708	10.94	9370	9.62	9605	10.04
Total area under crops	85446		88714	100.00	97432	100.00	95689	100.00

Contd....

Table - 29 (contd.)

Area Under Different Crops (District and Tahsil), Dewas

(in hectares)

	Area Under Crops in Bagli Tehsil							
	1975-76	%	1980-81	%	1983-84	%	1984-85	%
Rice	940		748	0.98	635		606	
Wheat	9453		5435	7.13	7508		6841	
Jowar	20555	27.2	27773	36.46	23444	27.57	18732	22.82
Corn	2466		3708	4.9	4322		4327	
Other cereals	355		255	0.3	365		152	
Pulses	5187		9011	11.8	12856		9492	
Sugarcane	2877		5457	7.2	4559		4443	
Other food crops	1221		816	1.67	1092		1332	
Oilseeds	4359	5.7	10782	14.2	16975	19.96	23862	29.07
Cotton	8405	11.13	3750	4.9	3017	3.5	2364	2.88
Other nonfood crops	9201		24975	32.8	30262		9921	
Total area under crops	75467		76178		85043		82072	

Contd....

Source: District Statistical Handbook, 1981, 1984, 1985, Dewas M.P.

Table - 29 (contd.)

Area Under Different Crops (District and Tahsil), Dewas

(in hectares)

	Area Under Crops in Kannod Tehsil							
	1975-76	%	1980-81	%	1983-84	%	1984-85	%
Rice	1010		866		594		630	
Wheat	5610	8.98	5547	8.3	6070	8.6	6872	9.68
Jowar	15021	24.04	20531	30.73	19985	28.33	18635	26.24
Corn	1120		1161		984		1126	
Other cereals	115		51		29		32	
Pulses	10425		7705		6884		6261	
Sugarcane	75		46		96		102	
Other food crops	233		219		229		257	
Oilseeds	2733	4.37	4218	6.3	7444	10.55	10373	14.60
Cotton	19641	31.4	18031	26.99	21221	30.08	19668	27.69
Other nonfood crops	6508		30683		35650		7070	
Total area under crops	62491		66809		70542		71026	

Contd....

Table - 29 (contd.)

Area Under Different Crops (District and Tahsil), Dewas

(in hectares)

	Area Under Crops in Khategaon Tehsil							
	1975-76	%	1980-81	%	1983-84	%	1984-85	%
Rice	483		447		291		368	
Wheat	14133	25.28	10969	18.92	10857	18.42	11543	19.06
Jowar	10977	19.64	14991	25.86	14138	23.99	14318	23.64
Corn	614		736		605		699	
Other cereals	109		43		63		24	
Pulses	8574		8236		8056		7740	
Sugarcane	24		16		24		21	
Other food crops	253		248		208		200	
Oilseeds	5775	10.33	1508	2.6	5315	9.82	8721	14.40
Cotton	12223	21.87	14555	25.11	16796	28.50	14333	23.66
Other nonfood crops	2736		22290		24694		2602	
Total area under crops	55901		57976		58936		60569	

Contd....

Table - 29 (contd.)
Area Under Different Crops (District and Tahsil), Dewas
(in hectares)

	Area Under Crops in Sonkatch Tehsil							
	1975-76	%	1980-81	%	1983-84	%	1984-85	%
Rice	782		585		443			
Wheat	11769	12.92	12313	13.00	12654	12.38		
Jowar	27088	29.73	35704	37.71	34768	34.01		
Corn	1240		1390		1270			
Other cereals	16		66		21			
Pulses	17312		12138		16906			
Sugarcane	863		1130		1708			
Other food crops	1210		1427		1166			
Oilseeds	11171	12.26	6667	7.04	18581	18.18		
Cotton	5582	6.13	2500	2.6	562	0.55		
Other nonfood crops	14073		29937		33284			
Total area under crops	91106		94690		102221			

Source: Census of India, 1971.

Table - 30
Production of Crops - 1983-84, Dewas District

Name of the Crop	Yield in Kg./Hectare	
	District	State
Rice	494	760
Jowar	835	801
Corn	809	-
Soyabean	442	-
Groundnut	651	518
Wheat	793	1055
Gram	590	619

SOURCE : District Statistical Handbook, Fertiliser Statistics, 1985-86, FAI, N.D.

level. The yield of wheat has decreased from 1049 kg. in 1980-81 to 647 kg. in 1983-84 while the area under wheat has decreased marginally.

Industry

Industrial development in the district is concentrated in and around Dewas. Dewas is under Integrated Development of Small and Medium Towns Scheme (IDSMT). The industrial development of this region is concentrating along the major route NH3 connecting Bombay and Agra, Side by side with this the facilities are also getting concentrated along the corridor (Map 7).

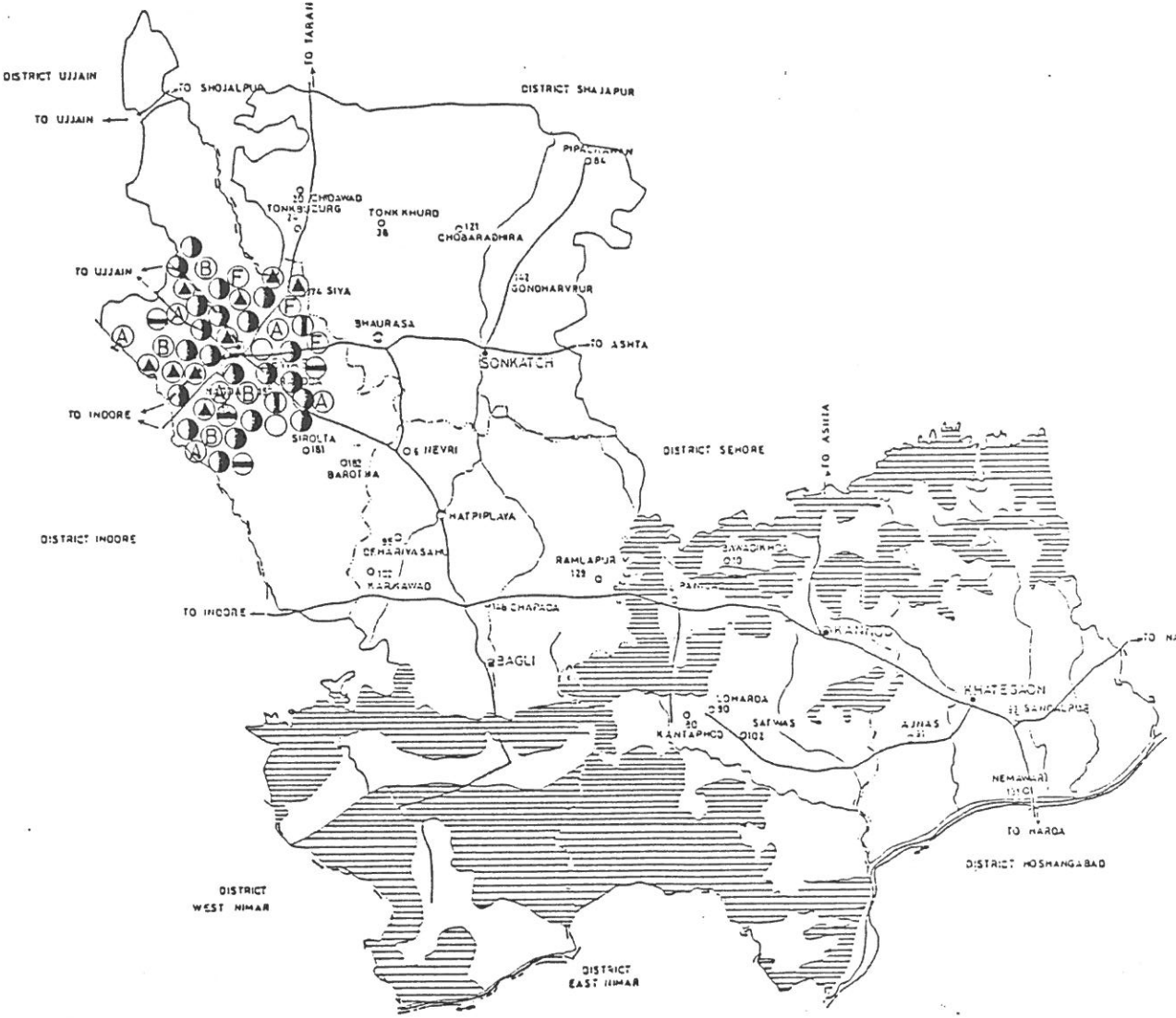
A district wise analysis of the 100 medium and large scale industries revealed the following facts :

Table - 31

Districtwise investment and employment in industries, 1981

	No. of Indts.	%	Investt. Rs.(lkh.)	%	Employment	%
Indore	31	31	2974.36	8.2	25288	39.18
Dewas	51	51	26219.6	72.7	12106	18.75
Ujjain	14	14	5911.59	16.4	31532	45.3
Dhar	4	4	931.00	2.5	616	0.96
Total	100	100	36036.00	100.00	69542	100.00

DEWAS
DISTRICT
GROWTH OF INDUSTRIES AROUND DEWAS



LEGEND

- DISTRICT BOUNDARY
- TEHSIL BOUNDARY
- RESERVED FOREST
- RIVERS
- ROADS
- RAILWAYS
- DISTRICT HEADQUARTER
- TAHSIL HEADQUARTER
- TOWNS
- VILLAGES ABOVE 2000 POPULATION
- (A) AGRO BASED
- (A) TEXETILES
- ENGINEERING BASED
- CHEMICALS
- ANIMALS
- (F) BASED ON FORESTS
- (B) BUILDING MATERIALS
- OTHERS

MAP-7

RURAL GROWTH CENTRES : PLANNING FOR HUMAN SETTLEMENT

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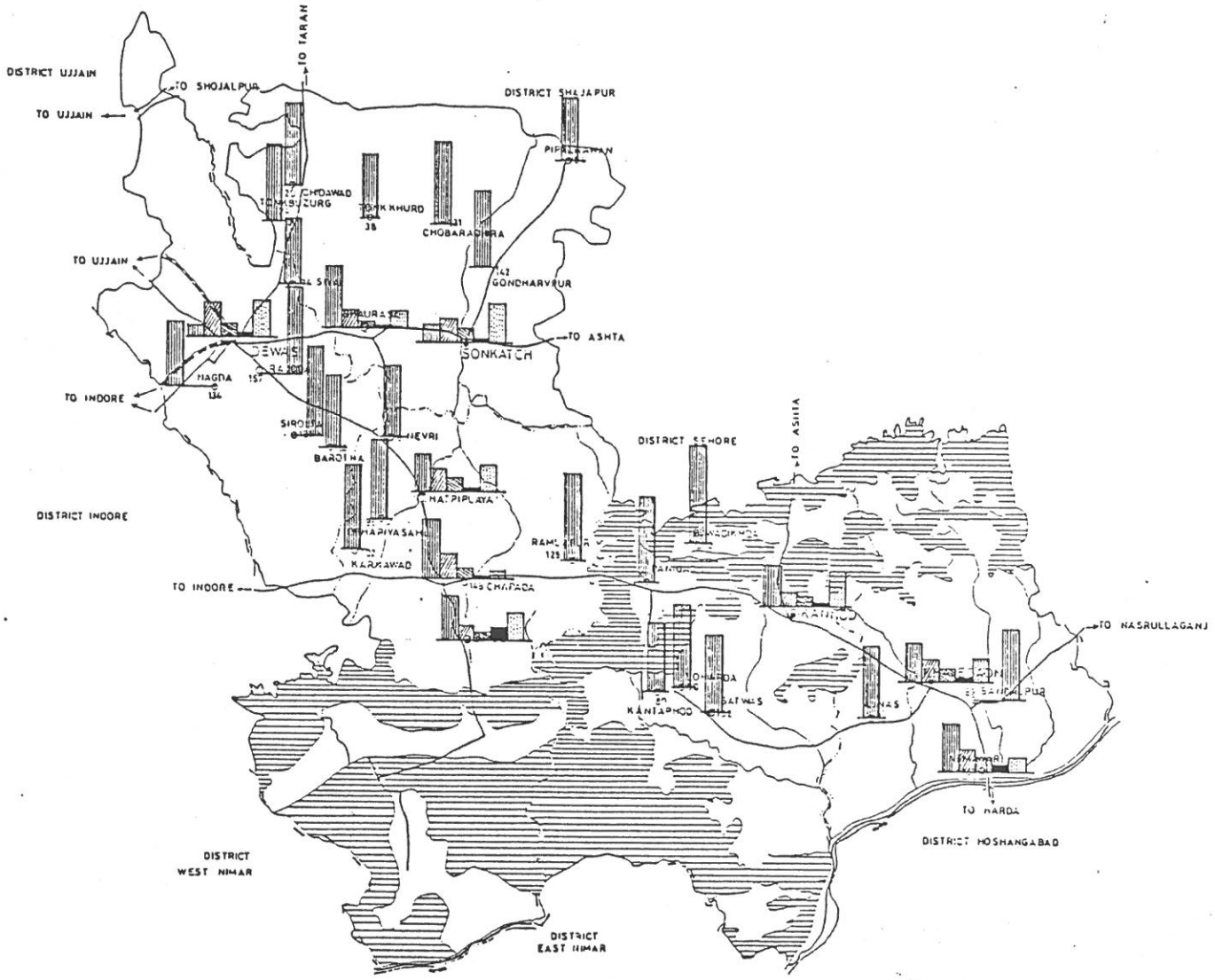
DEWAS
DISTRICT
OCCUPATIONAL STRUCTURE
ANALYSIS 1971



LEGEND

- DISTRICT BOUNDARY
- TEHSIL BOUNDARY
- RESERVED FOREST
- RIVERS
- ROADS
- RAILWAYS
- DISTRICT HEADQUARTER
- TAHSIL HEADQUARTER
- TOWNS
- VILLAGES ABOVE 2000 POPULATION
- PRIMARY SECTOR
- INDUSTRIAL SECTOR
- COMMERCIAL SECTOR
- TRANSPORT SECTOR
- SERVICES
- 100 %
- 75 %
- 50 %
- 25 %
- 00

MAP- 8

RURAL GROWTH CENTRES : PLANNING FOR HUMAN SETTLEMENT

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It is evident that Dewas has grown very fast industrially outstripping Indore & Ujjain having share of 51 per cent of total industrial units in the region. Dewas shares 72.7 per cent as the total investment in large and medium industries of the region followed by Indore. The high share of investment in Dewas is mainly because there is a currency note printing press in which the Government of India has invested a lot of money. However, Dewas shows little growth of small scale industries. There is a shift in industries from agro-based to non-agro based industries from 1961 to 1984 in Dewas.

Occupational Structure

Compared to 1971, the workers in Dewas tahsil have increased in 1981. This may be due to the industries that are coming up and the workers opting out of agriculture to become industrial labourers. There has been more than a gradual increase in the fourth sector, that is, other workers, (Table - 32).

The occupational structure of the population of the selected villages and towns is presented in Table 33. It reveals the predominantly agricultural character of the district. The percentage of workers engaged in the primary activity varies from 48.85 per cent in Nemawar to 96.21 per cent in Bawadikheda. In fact Nemawar (48.85%) and Chapada (57.57%) are the only two places where the percentage of workers engaged in primary activity is below 60 per cent (Map 8).

Table - 32

Tahsilwise Workers Classification, 1961, 1971, 1981

Tehsil kerl	Total			Agricultural labourers			Cultivators			H.H. Industrky			Other workers		
	1961	1971	1981	1961	1971	1981	1961	1971	1981	1961	1971	1981	1961	1971	1981
Dewas	44.10	29.58	34.7	49.9	41.4	36.3	19.9	22.3	20.5	9.7	12.3	2.5	20.5	25.0	40.6
Bagli	56.42	38.96	41.3	64.4	52.9	54.3	14.8	32.2	32.1	5.4	5.0	2.8	4.2	0.4	10.6
Sonkatch	53.93	34.76	35.45	64.5	55.5	54.59	17.8	27.1	26.9	5.9	5.5	2.7	9.0	8.7	15.6

Source: Census of India.

Table - 33
Occupational Structure of the Selected Settlements

		Total Workers		Primary sector no.	% to total workers	Indus-trial sector no.	% to total workers	Comm-ercial sector no.	% to total workers	Trans-port sector no.	% to total workers	Serv-ices sector no.	% to total workers 71 pop.
		No. of workers	% to total										
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.
20	Chidawad	551	27.34	458	83.12	37		16		1		39	
24	Tonk Buzurg	816	38.45	635	77.82	55		40		2		47	
38	Tonk Khurd	951	30.78	613	64.46	98		101		6		133	
84	Pipalrawan	1164	40.35	731	62.80	173		109		3		148	
121	Chobaradhira	854	38.42	721	84.43	91		23		-		19	
142	Gandharvpur	703	28.48	539	76.67	152		39		2		62	
74	Siya	712	32.32	465	65.30	132		44		7		32	
134	Nagda	711	27.27	464	65.26	53		105		1		88	
157	Rajoda	650	27.32	558	85.85	50		16		1		25	
181	Sirolya	1054	31.80	919	87.19	70		14		4		47	
182	Barotha	1150	33.71	817	71.04	181		52		4		96	
6	Nevri	1065	35.56	763	71.64	95		39		5		163	
95	Deharriya Sahu	855	40.46	616	72.05	40		10		-		26	
102	Karnawad	1547	37.61	1272	82.22	171		39		5		163	
129	Kamplapur	1025	31.01	873	85.17	61		34		-		57	
148	Chapada	704	34.24	407	57.57	169	24.00	70	9.94	12	1.7	46	6.53
10	Bawadikheda	844	36.04	812	96.21	17		3		-		12	
80	Kantaphod	1282	34.91	921	71.84	158		71		6		126	
90	Loharda	1196	45.41	1000	83.61	58		53		2		83	
102	Satwas	1087	39.77	749	68.91	158		74		9		97	
4	Panigaon	880	36.68	723	82.16	47		36		1		73	
83	Sandalpur	872	35.38	613	70.30	135		79		2		43	
91	Ajnab	747	34.25	516	69.08	142		42		1		46	
131	Nunawar	698	33.13	341	48.85	151	21.63	85	12.18	36	5.16	85	12.18

Contd....

Table - 33 (Contd.)

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.
	Dewas V.A.	12652	24.55	1376	10.88	4218	33.34	1742	13.77	642	5.07	4674	36.94
	Bagli	1450	30.00	663	45.72	233	16.07	120	8.28	34	2.34	400	27.59
	Hatpiplaya	2223	28.86	841	37.83	467	21.00	288	12.96	53	2.38	574	25.82
	Kannod V.A.	2524	31.30	1029	40.77	333	13.19	267	10.58	58	2.30	837	33.16
	Khategaon	2294	30.74	881	38.40	482	21.01	317	13.82	91	3.97	523	22.80
	Sonkatch	2181	26.50	430	19.72	502	23.01	320	14.67	58	2.66	871	39.94
	Bhaurasa	1802	28.49	1105	61.32	286	15.87	103	5.72	22	1.22	286	15.87

Note

Since the definition of workers and their classification did no reman the same from 1961 to 1981, for the sake of comparison the different sectors of the economy for 1961 and 1971 were together according to the classification followed by the 1981 census.

SETTLEMENT STRUCTURE

Population Growth

The population of Dewas district is 594, 336 while that of Madhya Pradesh is 41654119. The population of the district thus comes to 1.43 per cent of the state population. The rural population accounts for about 84 per cent of the district population whereas the urban population is 15.9 per cent as against the state percentage of 16.29 per cent. In other words the district is rural in character.

Dewas district ranks thirty-seventh among the forty-three districts of the state in population. During the decade 1961-71, the district population growth rate has been 32.99 as against the state growth rate of 28.67. The area of the district is 7,014 sq. kms. In other words, it has 1.58 per cent of the state area and ranks thirty-first among the districts of the state. The density of population per sq. km. of the district is 85 as against the state density of 94 and the district ranks twenty-seventh in density in the state. The sex ratio that is, the number of females per 1000 males, of the district and the state is 929 and 941 respectively. Tahsil Khategaon and Sonkatch have a higher sex ratio than the district, while the other tahsils have a lower one.

The percentage of literacy in the district comes to 21.58 as against the state literacy percentage of 22.14.

Table - 34

Distribution of Commuters to & from Dewas

Villages	Tahsil	No.of commuters
Nagukhedi	To Dewas	100
Singwada	"	150
Khotaria	"	-
Rasulpur	"	70
Agrod	"	720
Akborpur	"	-
Rajoda	"	400
Barottia	"	50
Sirolia	"	100
Towns		
Indore	From Dewas	500
Ujjain	"	600

SOURCE : Primary Survey

In 1961 the literacy percentage of the district (17.32) was slightly higher than that of the state (17.13).

The literacy percentage among males in the district (833.57) is higher than the state percentage of 32.70. Among females, the literacy pecentage in the district (8.68) is, however, lower than the state percentage (11).

Among the tahsils, Dewas tahsil has the highest literacy (31%) followed by Bagli tahsil (18). The same pattern is seen in female literacy in the tahsils. Amog males, Dewas tahsil is at the top with about 45 per cent while Bagli tahsil with about 25 per cent comes last. Among females also, Dewas tahsil leads in literacy with about 15 per cent while Bagli tahsil with 5.63 per cent comes last.

Spatial Interaction with other Settlements

Commuters from the selected settlements of Dewas tahsil travel to Dewas urban area while there is astrong interaction of Dewas urban area with Indore and Ujjain as can be seen from Table - 34. Indore the commercial capital of he state is in close proximity of Dewas and thus attracts a large number of commuters. Ujjain, a place of historical interest, being in the process of industrialisation draws even larger numbers of commuters from Dewas. The commutation to Ujjain is partly due to its importance as a centre of academics.

Settlement Structure of the District

The measurement of the spatial pattern of the district can be obtained by nearest beighbour analysis. The R value varies between

0.99 to 1.47. It is lowest in Kannod tahsil and highest in Dewas tahsil.

The distribution of villages and population of Dewas district as well as of the tahsils is given in (table 35(A)) reveals that around 37 per cent of the villages of Dewas district have a population size of 200-499. However, about 31 per cent of the population can be formed in the settlement size 500-999.

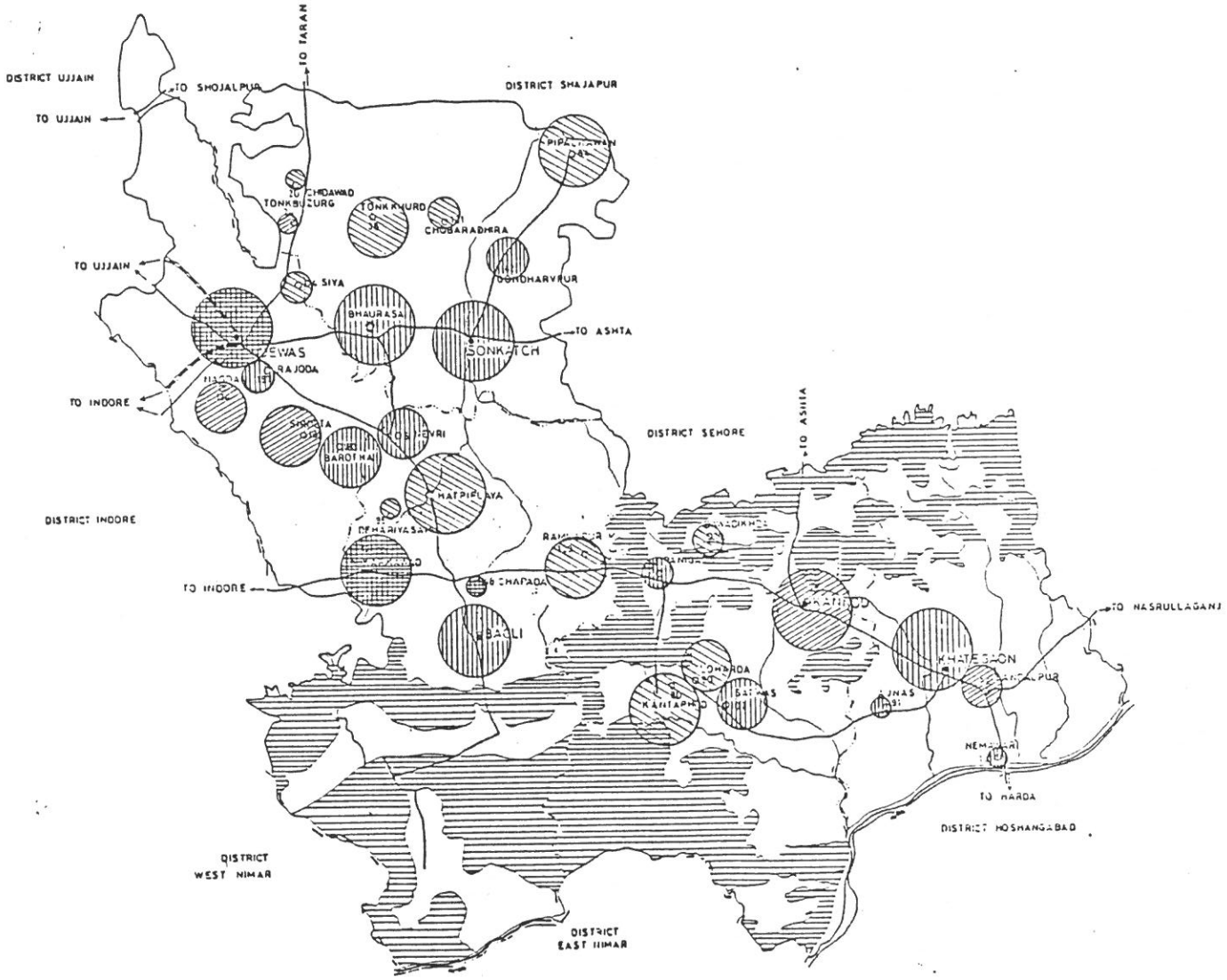
Among the five tahsils, Bagli has the highest number of villages (310), while Khategaon has the least (168). The highest percentage of villages in all the tahsils falls under the settlement size 200-499. There is, however, considerable variation in the percentage of population faling under the different settlement sizes.

The density of population per sq. km. is found to be highest in Dewas (231) followed by Sonkatch (139). It is the lowest in Khategaon tahsil.

It may be seen that Dewas district has a great potential for development as the concentration of settlements around Dewas is increasing and the growth rate of few settlements is as high as 164 per cent.

If we analyse the linkage among urban centres on Dewas Ujjain road, we find very few concentrations of settlements and those that do exist have a natural growth rate of population. But the settlements on the Dewas-Indore road have a very high growth rate. Thus a corridor development is taking place on the Dewas-Indore road. The growth of the settlements on the Dewas-Bagli road is quite low. The

DEWAS
DISTRICT
SETTLEMENT STRUCTURE
ANALSIS 1971



LEGEND

- DISTRICT BOUNDARY
- TEHSIL BOUNDARY
- RESERVED FOREST
- RIVERS
- ROADS
- RAILWAYS
- DISTRICT HEADQUARTER
- TAHSIL HEADQUARTER
- TOWNS
- VILLAGES ABOVE 2000 POPULATION

POPULATION GROWTH RATE 1961–71

- BELOW 25 %
- 26 % — 35 %
- 36 % — 45 %
- 46 % AND ABOVE

POPULATION OF THE SETTLEMENTS 1971

- 5000 AND ABOVE
- 4600 — 4999
- 4200 — 4599
- 3800 — 4199
- 3400 — 3799
- 3000 — 3399
- 2600 — 2999
- 2400 — 2599
- 2200 — 2399
- 2000 — 2199

MAP – 9

RURAL GROWTH CENTRES : PLANNING FOR HUMAN SETTLEMENT

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two towns Bagli and Hatpiplaya falling on the Dewas-Bagli road have registered growth rates of 41.31 and 29.72 respectively in 1971-81. This shows a clear disparity in the region as the benefits of Dewas have not spread in a balanced manner in the district.

In order to have a detailed analysis, 24 rural settlements were selected in different size categories with more than 2000 population, (Table - 36).

No major trend emerges out of the analysis of the settlement size and the growth from the 1971 data, though the sixth category of settlements with a population size of 3000-3499 shows the highest average rate of growth. The settlements in this size registered high medium (25-34.99) to high (45-59.99) rate of growth. The settlements with population sizes 2000-2199, 2200-2399 and 3000-3499 showed low-medium to high medium growth. However, the settlements with population sizes 2600-2999 and 3000-3499 indicate a comparatively low rate of growth. If we look at the tahsils Bagli shows the highest average rate of growth (42.61) followed by Kannad (35.33). Thus no major trend emerges out of the analysis of the settlement size iand growh rate though the highest average rate of growth has been registered by the largest size of the settlement (Map 9).

Table - 35(A)

Distribution of Population, 1971

Distt./Tehsil	No. of village	%	Less than 200	%	200-499	%	500-999	%	1000-1999	%	2000-4999	%	Total	%
Dewas Distt.	117	10.2	276	24.00	428	37.2	224	19.4	83	7.2	24	2.1	1152	100.00
			32362	6.5	142657	28.6	153464	30.7	10603	21.2	64948	13.0	499462	100.00
Bagli Tehsil	70	22.6	96	31.00	82	26.5	35	11.3	22	7.1	5	1.6	310	100.00
			10672	10.1	28069	26.6	23246	22.0	28936	27.4	14582	13.8	105505	100.00
Dewas Tehsil	22	9.1	57	23.4	104	42.8	49	20.16	6	2.4	5	2.1	243	100.00
			7484	6.9	33132	30.5	33663	31.0	20550	18.9	13914	12.8	108743	100.00
Kannod Tehsil	17	9.1	40	21.5	68	36.6	43	23.1	13	7.0	5	2.7	186	100.00
			4221	4.9	23721	27.5	28309	32.9	16093	18.7	13780	16.0	86124	100.00
Khategaon Tehsil	4	2.3	45	26.8	75	44.6	34	20.2	7	4.2	3	1.8	168	100.00
			5167	7.5	24261	35.4	23711	34.6	8693	12.7	6753	9.8	68585	100.00
Sonkatch Tehsil	14	5.7	38	15.5	99	40.4	63	25.7	25	10.2	6	2.4	245	100.00
			4818	3.7	33474	25.6	44535	34.1	31759	24.3	15919	12.2	130505	100.00

Contd....

Source: Census of India, 1971.

Table - 35(A)

Villages by Population Size, 1981

Distt/Tehsil	Total rural population	No. of villages	<2000		2000-2199		2200-2399		2400-2599		2600-2999		3000-3499		3500-4999		5000 +	
			No. of setl.	Pop.	No. of setl.	Pop.	No. of setl.	Pop.	No. of setl.	Pop.	No. of setl.	Pop.	No. of setl.	Pop.	No. of setl.	Pop.	No. of setl.	Pop.
1. Sonkatch	130505	245	239	114586	2	4137	1	2223	1	2468	-	-	1	3090	1	4001	-	-
2. Dewas	108743	243	238	94829	-	-	2	4582	-	-	1	2607	2	6725	-	-	-	-
3. Bagli	105505	310	305	90923	2	4169	-	-	-	-	1	2995	1	3305	1	4113	-	-
4. Kannod	86124	186	181	72344	-	-	2	4741	-	-	2	5367	-	-	1	3672	-	-
5. Khategaon	68585	168	166	61832	2	4288	-	-	1	2465	-	-	-	-	-	-	-	-
District(R)	499462	1152	1129	434514	6	12594	5	11546	2	4933	4	10969	4	13120	3	11786	-	-
	Total Urban population	No.of towns																
1. Sonkatch	14556	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	14556
2. Dewas	51886	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	51866
3. Bagli	12536	2	-	-	-	-	-	-	-	-	-	-	-	-	1	4832	1	7704
4. Kannod	8421	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	8421
5. Khategaon	7495	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	7495
District (U)	94874	7	-	-	-	-	-	-	-	-	-	-	-	-	1	4832	6	90042
R + U	594336	-	-	-	-	-	-	-	-	-	-	-	-	-	4	16618	6	90042

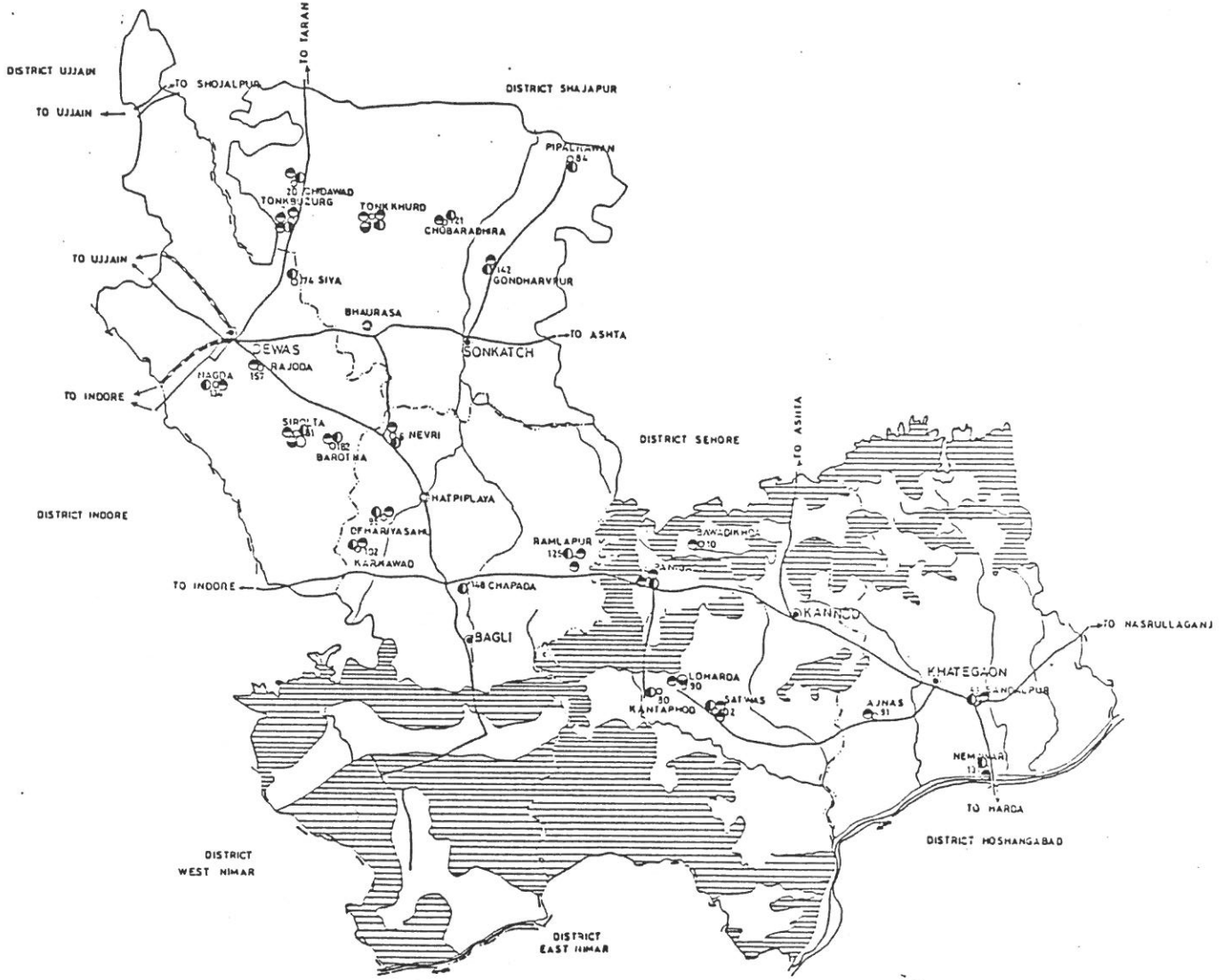
Source: Census of India, 1971.

Pattern of Distribution of Selected services and Facilities :

Education Facilities :

Educational faclities include primary schools, middle schools and high schools. The total number of villages with various educational faclities, ,within various distance ranges from the town, are as indicated in Table 36. A maximum number of villages (370) lie within the distance range 16-25 kms. from the nearest town and a maximum number of villages having educational facilities also lie in this range. The number of educational institutions in the villages of different tahsils is given in Table 37 (Map 10).

DEWAS
DISTRICT
EDUCATIONAL FACILITIES
ANALYSIS 1984



LEGEND

- DISTRICT BOUNDARY
- TEHSIL BOUNDARY
- RESERVED FOREST
- RIVERS
- ROADS
- RAILWAYS
- DISTRICT HEADQUARTER
- TAHSIL HEADQUARTER
- TOWNS
- VILLAGES ABOVE 2000 POPULATION
- PRIMARY SCHOOL
- MIDDLE SCHOOL
- SECONDARY SCHOOL

MAP - 10

RURAL GROWTH CENTRES : PLANNING FOR HUMAN SETTLEMENT

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Table - 36

Distribution of Educational Facilities in the District

Distance from nearest town (km.)	Total No. of villages	No. of villages having		
		Pr.sch.	M.S.	High or/H.S.
5 or less	102	43	3	-
6 - 10	281	92	15	1
11 - 15	236	83	13	1
16 - 25	370	127	22	3
26 - 50	212	70	9	1
51 - 100	14	3	-	-
101 - 200	-	-	-	-
201 and above	-	-	-	-
Total	1152	412	62	6

SOURCE : District Census Handbook, 1971

Table - 37

Tahsilwise Abstract of Amenities

Name of tehsil	Educational									
	Primary school		Middle school		Hr. Sec. school		College		Others	
	No. of vil. having sch.	No. of sch.	No. of vil. having sch.	No. of Sch.	No. of vil. having sch.	No. of Sch.	No. of vil. having sch.	No. of Sch.	No. of Vil. having inst.	No. of inst
1. 2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
1. Sonkatch	101	105	20	20	2	2	-	-	-	-
2. Dewas	110	110	19	19	3	3	-	-	-	-
3. Bagli	64	65	10	10	-	-	-	-	-	-
4. Kannod	78	80	7	7	1	1	-	-	-	-
5. Khategaon	59	61	6	6	-	-	-	-	-	-
Total	412	421	62	62	6	6	-	-	-	-

Contd....

Table - 37 (contd.)

Name of tehsil	Medical						Power supply & drinking water				
	Dispensary		Hospital		Others		Power S.		Drinking water		
	No. of vil. having disps.	No. of disp.	No. of vil. having hosp.	No. of hosp.	No. of vil. having instt.	No. of instt.	No. of vil. where P.S.		No. of villages having		
							Available	N.A.	Tap	Well	Others
1. 2.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.	23.
1. Sonkatch	10	10	-	-	5	5	16	229	-	91	140
2. Dewas	3	3	6	6	4	4	51	192	-	226	15
3. Bagli	4	4	4	4	4	4	28	282	1	214	21
4. Kannod	5	5	7	7	6	6	10	176	-	155	17
5. Khategaon	5	5	-	-	1	1	2	166	-	149	16
Total	27	27	17	17	20	20	107	1045	1	835	209

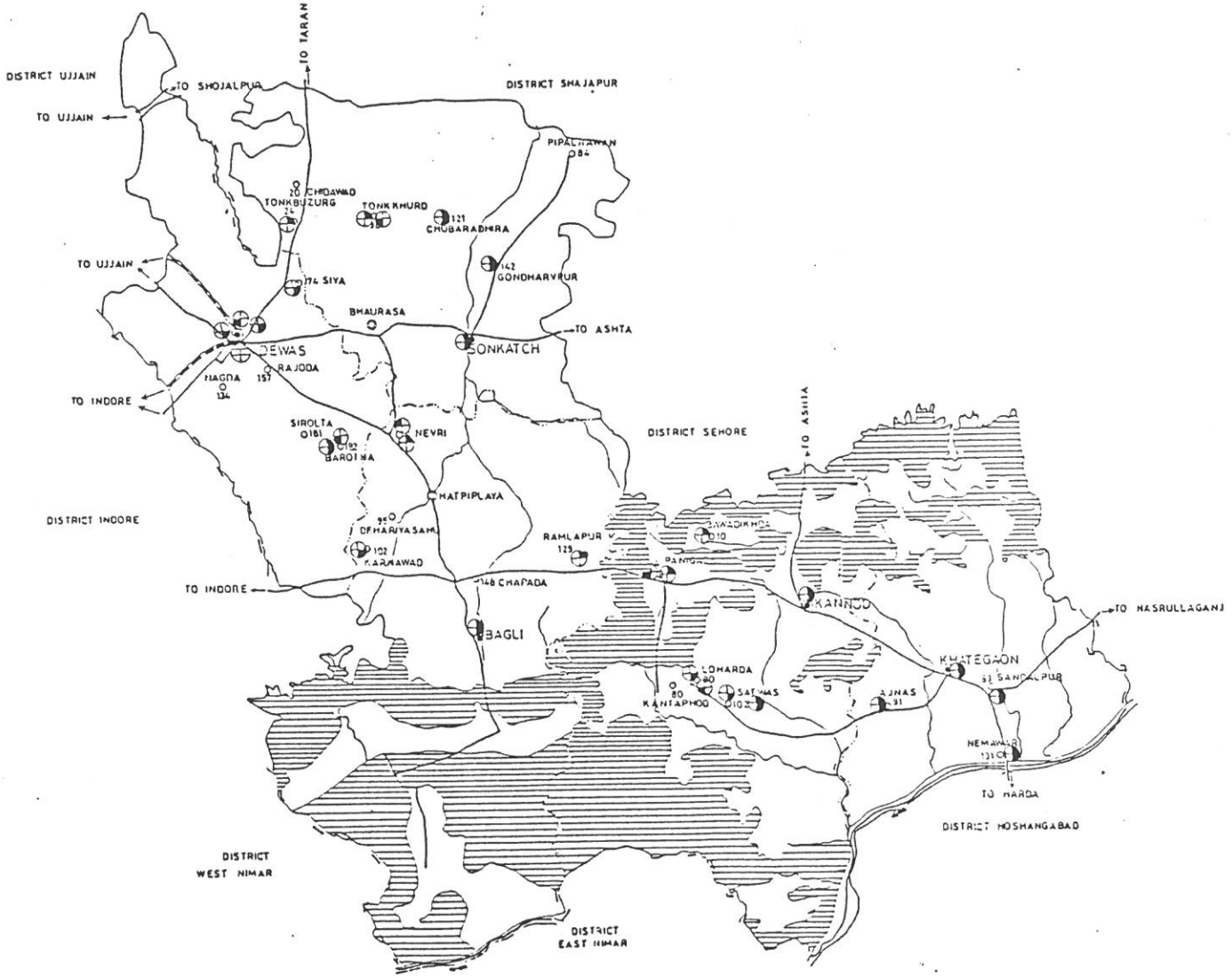
Contd....

Table - 37 (contd.)

Name of tehsil	Communication		Post and Telegraph					
	No. of vil- having		Post office		Telegraph office		Others	
	Pucca road	Kucha road	No. of villages having P.O.	No. of P.O.	No. of villages having T.O.	No. of T.O.	No. of vill- ages	No. of offices
1. 2.	24.	25.	26.	27.	28.	29.	30.	31.
1. Sonkatch	17	-	17	17	1	1	-	-
2. Dewas	30	15	19	19	-	-	1	1
3. Bagli	38	1	10	10	-	-	-	-
4. Kannod	40	17	10	10	1	1	-	-
5. Khategaon	26	-	7	7	-	-	-	-
Total	151	33	63	63	2	2	1	1

Source: Census of India, 1971

DEWAS
DISTRICT
HEALTH FACILITIES
ANALYSIS 1984



LEGEND

- DISTRICT BOUNDARY
- TEHSIL BOUNDARY
- RESERVED FOREST
- RIVERS
- ROADS
- RAILWAYS
- DISTRICT HEADQUARTER
- TAHSIL HEADQUARTER
- TOWNS
- VILLAGES ABOVE 2000 POPULATION
- VETERINARY HOSPITAL
- FAMILY PLANNING CENTRE
- HOSPITAL
- DISPENSARY
- PRIMARY HEALTH CENTRE
- T.B. CLINIC

MAP - 11

RURAL GROWTH CENTRES : PLANNING FOR HUMAN SETTLEMENT

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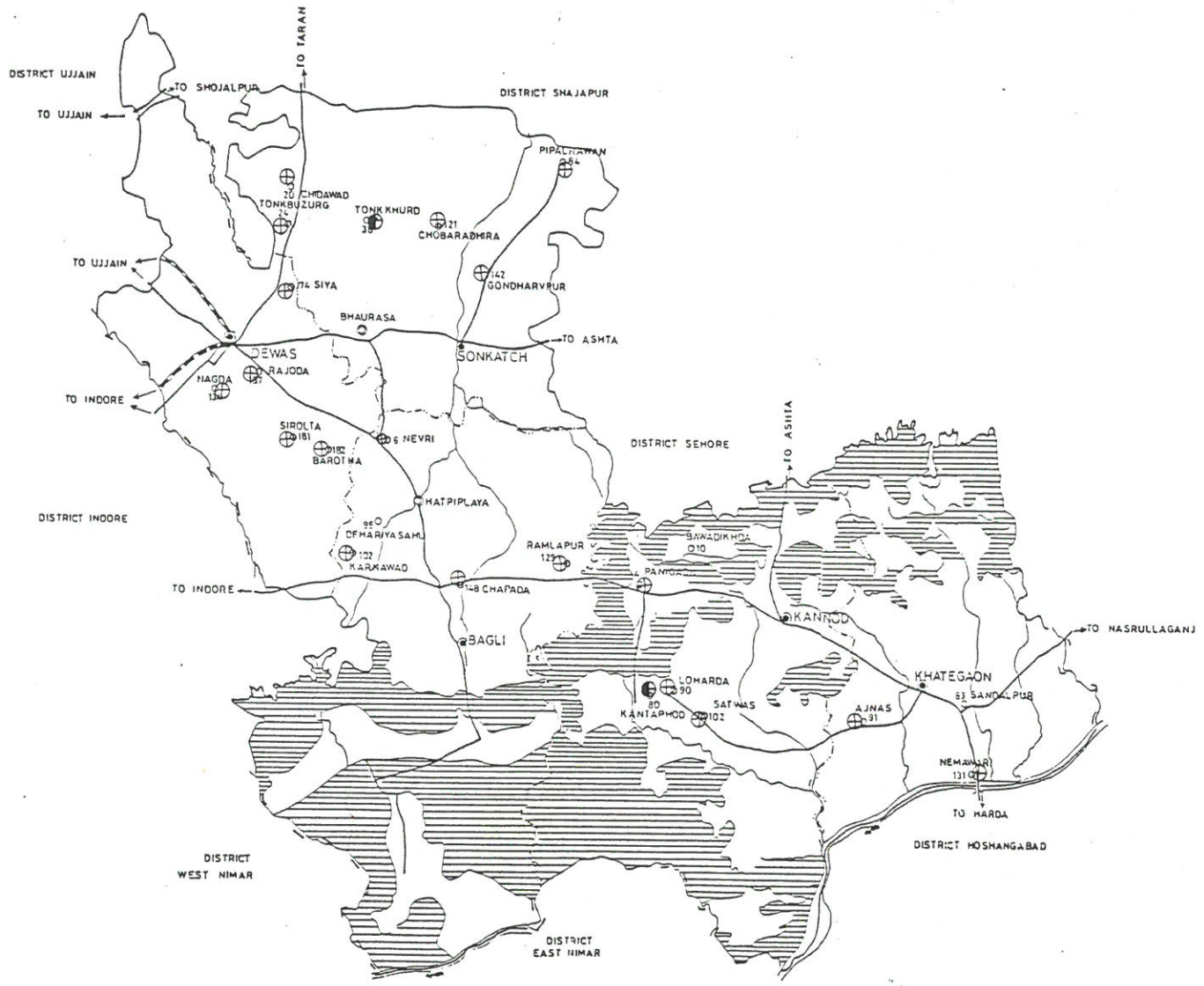
DEWAS
DISTRICT
POST & TELEGRAPH FACILITIES
ANALYSIS 1971



LEGEND

- DISTRICT BOUNDARY
- TEHSIL BOUNDARY
- RESERVED FOREST
- RIVERS
- ROADS
- RAILWAYS
- DISTRICT HEADQUARTER
- TAHSIL HEADQUARTER
- TOWNS
- VILLAGES ABOVE 2000 POPULATION
- POST OFFICE
- POST & TELEGRAPH OFFICE

MAP - 12

RURAL GROWTH CENTRES : PLANNING FOR HUMAN SETTEEMENT

0 4 8 12 MILE

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Medical Facilities

The availability of medical facilities per 100 sq. km. tahsilwise is given in Table 38. It shows that the villages of Dewas and Kannod tahsil have comparatively greater medical facilities per 100 sq. km. as 28 per cent of medical institutions in the rural areas of the district are in the villages of Kanod tahsil followed by Sonkatch tahsil (Map 11).

Posts and Telegraphs

The total number of villages in the tahsils of the district having post offices and telegraph offices and telephone facilities are given in Table 39. The number of post offices per 100 sq. km. area in each tahsil is indicated in Table 39. Rural areas of Dewas tahsil have comparatively more postal facilities (Map 12)

Marketing Network

All the six block headquarters with various other centres such as Tonk Kalan, Hatpiplaya, Karnawad, Kantaphod, Satwas, Bhourasa have regular markets. Out of this Dewas, Sonkatch, Hatpiplaya, Kannod, Khategaon form main marketing centres forinflow and outflow for the district produce.

Table - 38

Distribution of Medical Facilities in the Tahsil

Tahsil	Total area	No. of medical Institutions of any kind per 100 sq.km.
Sonkatch	1285.73	1.2
Dewas	987.93	1.3
Bagli	1507.51	0.8
Kanood	1401.71	1.3
Khategaon	1097.10	1.5

SOURCE : Census, 1971

Table - 39

Distribution of Postal Facilities in the Tahsils

Name of Tahsil	Total area in sq. km.	No. of post offices per 100 sq. km.
Sonkatch	1,285.73	1.3
Dewas	987.93	1.9
Bagli	1,507.51	0.7
Kannod	1,401.71	0.7
Khategaon	1,097.10	0.6

SOURCE : Census, 1971

Table - 40

Variation in the Availability of Different Types of Services and Facilites in Rural Settlements

Settlement Size	Total No. of villages	Total no. of services and facilities available in villages													
		12	11	10	9	8	7	6	5	4	3	2	1	0	Total
1. 2000-2199	6										2	3*	1		6
2. 2200-2399	5									1	1	1	2		5
3. 2400-2599	2										1	1			2
4. 2600-2999	4									1	2	1			4
5. 3000-3499	4								1	1	2				4
6. 3500-4999	3										2	1			3
									1	3	10	7	3		24

Source: Census of India, 1971.

Bank-12
Bus stop-11
Telephone connection-10
Post Office-9
Tap water-8
Veterinary hospital-7
MCW & FPC-6
Primary health centre and dispensary-5
Technical Instt.-4
College-3
Higher Sec.School-2
Middle school/Sec. school-1
Nil - 0

*The figures show the number of settlement having the corresponding facilities shown in the column, e.g. in 2 facilities are available in 3 settlements within the category.

Banking Network

There are 86 branches of commercial and co-operative banks operating in the district.

Concentration of Functions in the Selected Settlements

There is much inter-settlements variation in the availability of facilitiess which can be seen from Table 42. Tonk Khurd is the only settlement with five facilities and it falls in the fifth category (3000-3499) of settlement size.

There are two settlements with three facilities in the sixth category and one settlement with two facilities. This category accounts for 2.4 per cent of the population. It has already been noticed that only one settlement (Loharda) in the fourth category of settlements has registered a high rate of growth and it has four facilties. There are two settlements in the third category with three facilities each. One settlement in the third category (2400-2599) has three facilities and another has two facilities. It can be recalled that this category has not grown at a high rate. Again one settlement in the second category (2200-2399) has four facilities.

Thus it can be said that there is no definite pattern that emerges out of the analysis of settlement size and facilities concentrated in them. Different criteria seem to have dominated different functions.

The pattern of clustering of services and facilities in the selected rural settlements reveals the following characteristics :

i. Higher Secondary Schools are concentrated in the settlements with populations of 2600-2999 and 3000-3499.

ii. Post and telegraph facilities are concentrated in the settlements having populations of 3000-3499 and 3500-4999.

CHAPTER IV

GOALS AND OBJECTIVES OF THE DEVELOPMENT PLAN: IDENTIFICATION OF PROBLEMS AND ISSUES

Objectives and strategies are the main guiding forces of the regional development plan. The success of any such plan depends upon a thorough analysis of resource potential and constraints. After such an analysis the following issues emerge which appear to need special attention in planning strategies.

Regional Issues

There exists a large variation in the urbanisation levels between Wardha and other urban settlement in Wardha district; likewise between Dewas and other urban settlements in Dewas district. In Wardha the urbanisation level varies from 35 per cent in Wardha to 12 per cent in Arvi tahsil while in Dewas it varies from 35 per cent in Dewas to 10 per cent in Bagli tahsil. Similarly there is a variation in the growth rates of different urban settlements ranging from 33 per cent in Hinganghat to 6.00 per cent in Pulgaon in Wardha district, 60 per cent in Dewas to 21 per cent in Kannod in Dewas district. Dewas in Dewas district and Hinganghat in Wardha maintain a primacy that is two to three times that of the second biggest settlement in the respective districts. Further, the growth rate of all the urban settlements in Hinganghat town in Wardha district are declining and the sex ratios are increasing in all the towns except Deoli indicating the migration of male population to seek employment outside the district. The issue that emerges is whether of not an intervention can be made in this kind of situation.

Agriculture

There is a rapid changing trend of cropping pattern and soyabeen is emerging as a major crop in the Dewas district while cotton is declining. The area under soyabean (1980-84) has increased to 250 per cent. The issue is whether this is desirable for future land cultivation.

Infrastructure

The physical and social infrastructure is concentrated in Dewas and Wardha and Hinganghat whereas the other settlement such as Kannod, Hatpiplaya and Bhaurasa in Dewas district and Pulgaon, Deoli and Sindhi in Wardha district have inadequate basic services such as dispensaries, educational facilities and animal husbandry and such like in terms of area accessibility standards. But in terms of population thresholds such basic services cannot be maintained.

Industry

The policy of "industrial backward district" in Dewas has led to industries in Dewas along with the necessary infrastructure on the Agra-Bombay corridor while the rest of the district remains depressed and poor. This is in spite of the fact that the area has resources and potential for the development of industries if the infrastructural facilities could be provided in order to have a balanced development of the district in the region. This gives rise to a policy issue whether the concentration of industries should be allowed only in Dewas tahsil along the corridor or whether industries should be dispersed around the region.

On the basis of our studies and analysis of the settlement structure in Wardha and Dewas district the following objectives and planning strategy emerge.

Sectoral Objectives

Settlement

The aim should be to discourage the present trend of urbanization in Indore, Dewas and Ujjain by developing countermagnets.

Agriculture

Agricultural productivity must be increased for industrial and domestic consumption.

Infrastructure

The socio-physical and economic infrastructure must be upgraded to take care of increased economic activities and other functions.

Industry

Industrialisation must be induced in relatively backward areas which have a propensity for growth.

Environment

A balance ought to be maintained between increased economic activity and environmental conditions.

Resources

It is essential to optimise the natural and human resources in the region.

Institutions

Reform in the suitable institutional framework is necessary to take care of regional development.

A Strategy must be Derived in order to

- develop a hierarchy of settlements (with a strong economic base) to act as countermagnets to already developed first order settlements;
- give emphasis to extensive agriculture through improved technology;
- upgrade accessibility, educational facilities, trade and commerce;
- emphasise agro-based industries with local resource base through policy incentives;
- make available employment opportunities through job training, enhancement of optimum industrial and domestic utilisation of natural resources.

Detailed Strategies for Sectoral Development in Wardha and Dewas Districts

The objective of the plan is to develop an initial and general framework for the spatial organisation of the study area. It covers all sectors and attempts to focus on the spatial organisation of area by identifying hierarchies with a potential or need for future development as well as the settlements within the probable service area of each centre.

The settlement plan is based principally on the existing conditions, the present load network, traffic flow and size and institutional development of towns and villages. It concerns the present distribution of activities in space which facilitates the evaluation of the existing spatial ordering of blocks and ways of improving it. At a later stage, the effects of new conditions created by projections or present trends need to be considered.

Strategies

In order to fulfill the above objectives certain strategies were planned on the lines given below:

- Centres must be located so as to optimise their accessibility for the settlements they are to serve through the transportation network.
- Since resources are limited, it is necessary to consider past growth and the present relative importance of the settlements in the block and to take advantage of the existing situation unless there are vary strong reasons for going counter to the forces which have shaped them.
- The hierarchies of settlements are determined by (i) standards for maximum (or average) distance the user must travel; (ii) minimum (or maximum) populations to be served by one activity centre or facility; and (iii) minimum production required to support an activity.

Functions of the Settlements of Various Hierarchial Level

In order to bring a balanced regional development and to allow it to trickle down to the remotest village in Wardha and Dewas districts, a hierarchial development was suggested. The centres of each level perform functions of different levels in order to ensure accessibility to all.

Wardha District

Wardha is the highest level settlement in the district and its population is 1.5 times more than the population of the next higher centre, namely, Hinganghat. However, the growth of Wardha has slowed down in the last 10 years and the settlements around Wardha at a distance of 10-15 km. are growing faster at the rate of 40 per cent to 60 per cent. The growth of Hinganghat has also been very fast in the last decade, from 20 per cent to 33.20 per cent. If this trend is allowed to continue the settlements around Wardha will become parasitical by growing at the cost of Wardha.

The main aim of the plan should be to disperse development away from Wardha and to prepare certain other settlements, which can act as countermagnets to the further growth of Wardha. In a way Hinghanghat being selected as an IDSMT town will be a good choice for balanced regional development in the district.

Hinganghat and Pulgaon are second order settlements. The analysis has revealed that the growth rate of Hinganghat is the highest in the district and it is at the second level by virtue of its centrality score. Therefore, Hinganghat would be ideal to develop as a growth centre in the district.

Deoli has been proposed as a growth centre as it is equidistant from Pulgaon and Wardha and it is a production centre for cotton bales. By developing it as a growth centre, the local resouces can be processed in the area itself and the tahsil can benefit from its forward and backward linkages.

Agro based industries must be located in Arvi considering it to be an agriculturally rich area near Pulgaon with rail and road links that will help its economic development and infrastructure base as a second order settlement.

Ashta and Karanja, the rural settlements located near Nagpur have shown higher growth rate in terms of population, and provision of infrastructure. They could also be developed as rural growth centres by providing a proper infrastructure base and by locating mandies for exporting commodities from Arvi tahsil.

Dewas District

It is suggested that Dewas town which has had rapid growth for the last 10 years must slow down its growth rate so that development does not tend to get concentrated only near the corridor, but can also reach the remotest parts. Considering the growth pattern of Dewas and other settlements in Dewas district, it may be mentioned here that the selection of Dewas as an IDSMT town may not help in diffusing the balanced growth in other settlements of Dewas district.

Table : 41 Hierarchy of Settlements in Wardha and Dewas

Order	Type of centres	Districts in this		Population range	No. of centres it caters to
		Wardha	Dewas		
I	Metropolitan	Nagpur	Nil	+ 10 lakhs	1
II	Regional	Nil	Indore, Ujjain	2 lakhs + to 8 lakhs	
III	Growth	Hinganghat, Pulgaon Wardha Arvi	Dewas	30,000 to 50,000	4+6
IV	Service	Karanja, Ashti, Selu, Anji Alipur, Sindi	Kannod, Sonkatch Deoli Kartaphod	4500 to 8000	6

Proposal for Physical Linkages

Policy

Incorporate the proposals of either improvement of existing linkages by upgrading existing or providing new linkages.

- Providing linkages from central services village to dependent villages.
- Providing all weather roads vertically from service centre to higher order centre.

Proposals

i. upgrading the major district roads from Hinganghat to Nagpur;

ii. linking Dewas with Bagli by rail link for weaning away the industrial growth from the Dewas-Indore corridor in Dewas district; and

iii. connecting Dewas Barotha-Bagli by a major district road in Dewas district.

TABLE

PROPOSED FUNCTIONAL UNITS AT DIFFERENT LEVELS FOR REG

ECONOMIC SERVICES

Land Development Bank Or Agriculture Financial Corporation.	Several Banks	Truck Terminus	Tractors Sub-Depot	Piggery & Poultry Development Project Centre	Specialised Retail Shopping Centres	Agricultural Implements Store	Fertilizer Godown	Seed Godown	Regulated Markets & Godown Facilities	Wholesale Market With Cold Storage Facilities	All Shops Available	Pesticide Insecticide Godown	Railway Station	State Highway	Irriga Offic Inclu Mino Irrig
Land Development Bank Or Agriculture Financial Corporation..	Commercial Banks	Truck Terminus	Tractors Sub-Depot.	Piggery & Poultry Development Project Centre	...	Agricultural Implements Store	Fertilizer Godown	Seed Godown	Regulated Markets & Godown Facilities	Wholesale Market With Cold Storage Facilities	General Workshop With Specialised Service	Pesticide Insecticide Godown	Railway Station	State Highway	Irriga Offic Inclu Mino Irrig
Land Development Bank Or Agriculture Financial Corporation.	Branch Banks (Commercial					Agricultural Implements Distribution Centre	Fertilizer Sub-Depot	Seed Sub-Depot	Grain Mandi	Retail Market With Consumer Co-operative	General Workshop	Pesticide Insecticide Sub-Depot	Railway Station	Metalled Road (D.R.)	Irrig Sub
	Co-operative Bank Branch							Plant Nursery & Seed Distribution Centre & Herbarium	Bi-Weekly Market	Consumer Co-operative Store Shops	Repair .... Shop	Pesticide Fertilizer Agricultural Implements Distribution Centre	Railway Station	Metalled Road (D.R.)	Loc Irri Cen
									Weekly Market	One or Two Shops	Mobile Repair Shop	Mobile Pesticide Sprayer		Village Road	Tub Ope

State Central Goverment

Strategy for Social and Physical Infrastructure

The table (42) indicates the necessary provision of the infrastructural facilities at different levels of the hierarchy of settlement in both the districts.

Industrial Objectives & Alternatives

With the present knowledge of the potentials and constraints we have come out with the following objectives for industrial developments.

To Reduce Regional Disparity

At the moment about 99 per cent of the industrial establishments including agro based, non-agro based and small scale industries are concentrated in urban centres which lie along the Dewas Indore corridor in Dewas district and Wardha-Nagpur and Wardha-Pulgaon-Arvi corridors. With the analogy drawn from the data analysis it is reasonable to develop potential "industrial centre's" which will act as counter magnets to the "urban centres" in order to bridge the gap between rural and urban income.

Emphasis on Agro-Related Industries

Since we have found both the districts to be rich in agro products which can support a large number of industries, it is proposed to recommend more agro based industries.

In order to achieve the above objectives, a policy of decentralisation and dispersion of development is suggested.

Basis for Distribution of Functional Specialisation

Following the objectives mentioned above, studies have been made to decide upon the centres for the specialisation of activities in order to assess the propensities of each centre to grow with the planning unit.

To do this, an index of local specialisation or location quotient with the district level data on current registered industrial set up in both districts up to 1980-81 was worked out. This index is just a ratio of an industry share of natural employment or the local industry's share of industrial employment relating to the locality's share of the national employment. This technique is borrowed from Urban Research Methods by J.P. Gibbs. In our case, with some modification in the model, the district as a whole represents the nation. The formula of this model is as follows:

$$e_i / e_t \; / \; E_i / E_t$$

Where,

ei represents	local (sector) industry employment
et represents	local (district) total employment
Ei represents	the district's industry employment
Et represents	the district's total employment.

When the value of the index is one or greater than one, local production per capita is equal to the districts production per capita and therefore, local production is just sufficient to satisfy local

consumption on demand and the local industry neither exports nor imports the products in question and vice-verse. With regard to the Wardha and Dewas districts the model revealed that:

- Dewas tahsil is self-sufficient in agro based industries and has exportable surplus in engineering based industries.

- In a district such as Wardha, where cotton constitutes the major non food crop, cotton spining and weaving has naturally been an important cottage industry for a long period of time. Among the urban areas Sindhi has the largest textile establishments (50%) followed by Hinghanghat (18%), while the tahsil-wise analysis shows the maximum number of establishments in Wardha tahsil (33%) followed by Hinghanghat and Arvi. The district has exportable surplus in textile industries while it is not self sufficient in any other sector. The development of Sindhi in terms of locating industrial establishments would follow the same pattern as we have seen in Dewas (corridor development), due to its proximity to Nagpur. There is enough potential to develop engineering based industries in Arvi, Pulgaon and Hinghanghat.

Identification of Backward Tahsil in Industry

The recommendations made in the past by the Pande Working Group and the Wanchoo Committee Report, have not been followed properly. For example, if we consider the Pande a group's recommendations of taking only those districts outside a 50 mile radius from large cities and large industries, then there would be no other place except the present centres of industrial location in the districts as most of the backward areas fall within the 50 mile radius.

Therefore, based on the nature of development in the two districts and the fact that district level development has failed to spread the industries evenly, the identification on tahsil level has been recommended adopting the following criteria:

- tahsils with basic infrastructure to support either small scale or large and medium industries;

- tahsils with resources to support resource based industries;

- tahsils with low percentage of population engaged in the industrial sector;
- tahsils with low urbanisation rate;
- tahsils with water resources potential to support industry.

Adopting these criteria in two selected districts, the tahsils are classified into two categories, namely 'A' for big city tahsils or industrially forward tahsil and 'B' for industrially backward or no industry tahsils.

Wardha District	Dewas Districts
A category - Sindhi, Wardha	Dewas
B category - Hinganghat, Arvi and Pulgaon	Bagli, Sonkatch and Khategaon

In the 'B' category, all the tahsils are not found at the same level. Therefore, consideration must be given to rural growth centres adopting the criteria mentioned above. Rural growth centres have been identified to make sure that the industrial benefits may reach the remotest parts of the area. Therefore, Selu and Waigaon, in Wardha and in Dewas tahsils have been selected.

Development Strategies

In order to facilitate industries in the 'no industry tahsil', the following strategies may be adopted.

Dewas District

- Dewas to continue to develop in Non-agro based industries.
- Tonkonmas and Ramalpur to act as relief centres for industrial development in Dewas.
- Industrial estates to be established at Bagli and Khategaon.

Wardha District

- Industrial estate to be established at Hinganghat
- Agro and small scale industries in Arvi and Pulgaon to be encouraged.

Policies must be framed to encourage the spread of small scale and agro based industries to the growth centes within the 'no industry tahsils' and an attempt through policy guidelines must be made to encourage the spread of the secondary sector to the rural areas instead of concentrating them in the growth centres. In such cases, handicrafts, cottage and low capital industry can be helped to function in the villages.

CHAPTER - V

IMPLICATIONS OF DEVELOPMENT PLANNING AND STRATEGY FOR INTEGRATED AREA DEVELOPMENT - SOME LESSONS FROM WARDHA AND DEWAS AREA STUDY

The question is whether the programmes and schemes of small and medium towns, can be effectively implemented to achieve their objectives without the interlinkages of rural development. Can agriculture be commercialised and the agriculturist have easy access to adequate support for supplies, credit, marketing and technologies without a viable system of human settlements establishing a symbotic relationship between the rural hinterlands and the small and medium towns? Can health and educational services be delivered and growth impulses transmitted directly from the remote major cities to the rural areas without a development oriented hierarchy of settlements, equipped with varying degrees of urban infrastructure?

The mere sectoral allocations for economic and social services by the respective departments cannot give the desired results. There must be locational footholds in the form of an urban/semi-urban hierarchy of settlements for the effective delivery of these services. Poor urban hierarchies or the absence of a settlement size, not only hinders the downward flow of services and development impulses but actually has the effect of polarising socio-economic development stultifying the spread-effects and arresting diffusion to the peripheries and outwards to the lagging areas.

District Planning and Spatial Perspectives

It is not that there has been a lack of awareness about the need for rural support centres/growth/centres. The Draft Seventh Five Plan, 1985-90, also recognises that "Planning of urban development should essentially be supportive of the economic development in the country, state or sub-region, be it in agriculture, extractive industry, manufacturing industry or in the tertiary sector. The provision of urban services such as transport, communication, water, sanitation and shelter alone is usually unlikely to stimulate large-scale urban development. It is important to time investments in urban services and shelter to coincide with investments in agriculture and industry, mining and commerce which provide sources of permanent employment. Therefore, a proper urban development approach mush consist of two constituents. The first is the interaction between physical and investment planning and the second is the preparation of regional and sub-regional urban development plans to make the first possible".

A rural-urban balances is essential for the healthy growth of both. In the absence of integreated planning of rural growth centres and the development of small and medium sized towns, large metropolitan areas may develop excessive concentrations of population, with their attendant problems. Small and medium sized towns may, on the other hand, fail to develop into growth centres, supporting and stimulating the rural hinterland. Growth centres, rural and urban, will have to be linked in a graded hierarchy. There is however no indication in the Seventh Five Year Plan, as how these objectives will be achieved.

The present approach to the "growth centre" idea is utterly limited and halting. The location of a growth centre or the selection of an existing small town, or a large village is generally an ad hoc decision often influenced by administrative and political exigencies. A number of questions arise:

- Can growth centre strategies be purposeful and effective in ensuring dispersal without taking into account the spatial and functional interlinkages between town and country?
- Can investment planning and resource allocation be divorced from the planning of physical interrelationships between various levels of human settlements?
- Will the district plans continue to remain sectoral plans or should they be integrated with a spatial development plan of human settlements?

It is necessary to recognise the horizontal and vertical relationships between the different sizes of human settlements from the villages to the district and regional town or city in terms of space, population to be served, functions to be performed and the level of services to be delivered. The primary "growth centre" - a large village or a small town must have a two way relationship, serving on the one hand the villages in its command area and on the other, establishing linkages with higher level settlements for transmitting institutional support, development benefits, innovations and technology.

The present methodology of the District Plans fails to recognise this vital relationship. They are almost exclusively rural development plans with sectoral allocations. If the objectives set out in the Draft Five Year Plan are to be realised, the techniques and scope of District Plans need to be reoriented in two respects:

i. District Plans should cover the whole range of human settlements and the programmes and policies of rural and urban development should be interlinked in a holistic sense; and

ii. Development strategies should be linked to a spatial physical and resource plan of human settlements from the village upwards for balanced growth and equitable delivery of services.

It would be pertinent to refer here to the role of the Town and Country Planning Departments in the preparation of Master Plans of towns and cities. In sharp contrast to the District Plans, these urban area plans are not only largely physical land use plans but they have also failed to link them to the economic and service needs of the surrounding country side. Even when peripheral areas are included in the Master Plans, or in a Metropolitan Regional Plan, the dominant consideration is the improvement of the urban environment rather than an integrated approach to rural-urban planning with socio-economic content. The physical planner's approach must also change to a strategy of overall settlement planning in relation to areas, levels of socio-economic functions, and transportation needs and the environmental and ecological considerations for the rural and urban communities. It is within this broad framework that detailed localised planning for villages, towns and cities should be undertaken. At the same time the discipline of Town and Country Planning must be brought in to provide the physical and spatial dimensions to socio-economic planning at the district and state levels. The new approach of spatial allocations for integrated development can help to bridge the gap between the economic planners, who neglect problems of space, and the physical planners, who have been fighting shy of using economic and management tools in planning.

Detailed Strategy for Integrated Area Development - Some Lessons from the Wardha and Dewas Area Study

The basic arguments in support of the creation of central places for integrated area development have been spelled out in the first chapter to stress the process of functional organisation of relatively homogeneous geographical regions. This meant considerable departure from or the extension of the theoretical framework of central places as originally propounded. Thus central places are regarded as nodal centres of different sizes or levels, and the extent of horizontal (spatial) and vertical (number and functions of centres at different levels) regularity in the development of a central place system would be a measure of the pattern of development leading to more even distribution of benefits of development and lessening of intra regional disparities.

In Wardha and Dewas there are two processes at work which need to be taken into consideration before formulating an area development strategy. Firstly the proximity of Nagpur, Indore or Ujjain as the major economic focus and the gap in the functional economic status as between Nagpur and the next order centres such as Wardha and Hinganghat would necessitate further upgrading of the latter. Within the district the study reveals that there are gaps in the settlement hierarchy at least at two levels. At the lowest level, the rural settlements are devoid of central places and as such, the system of settlements both in their ranks and hierarchy shows that most rural settlements do not possess functions required for centrality. At the intermediary level there are few small towns such as Pulgaon and Sindhi in Wardha, and Bagli and Sonkatch in Dewas, and large sized villages such as Selu, Ashti and Karanjia in Wardha which are now

acquiring nodality as a result of their growth as market centres. At this level there is a need for the creation of a large number of central places which in the long run would establish their nodality.

The analysis of the association of the services and facilities has also brought out the fact that the basic strategy common to Wardha and Dewas in general should be to provide at least a three-tier pattern of central places from among the rural settlements in the first instance:

Level	Size	Facilities
I.	Settlements in the range of 3000-5000 popn. and above	(i) Market (ii) Bank (iii) High school (iv) Post Office (v) Agricultural extension and other training facilities (vi) Health centre (vii) Veterinary facilities (viii) Fertilizer and seed depot (ix) Agricultural implements, spare parts maintenance and repairs (x) Metalled road connecting adjoining smaller settlements
II.	Settlements in the size range of 1500-3000	(i) Middle school (ii) Post-office (main delivery and savings) (iii) Fertilizer and seed storage facility (iv) Dispensary (v) Mentalled roads linking with level I centres and those of level III.
III.	Settlements of 800-1500	(i) Primary school (ii) Postal facilities (mail delivery and collection) (iii) Dispensary (iv) Fertilizer and seed storage (v) All-weather roads linking settlements of still smaller size

The choice of settlements will depend upon the situation and the existing levels of facilities and services available in the settlements. For this purpose the District Development Board should have an Inventory and Analytical Unit that can translate the area development strategy into a spatial development framework and also evaluate the progress from time to time.

The relevance of such a strategy for a three-tier hierarchy of central places among rural settlements is evident if we consider the IDSMT Programme under the Sixth and Seventh Five Year Plans. The hierarchic pattern will bring about greater efficiency and result in greater economies of scale and avoidance of wastage due to the choice of wrong locations which are often motivated by narrow political considerations. Also, from the point of view of the agricultural development strategy the approach to the location of centres equipped with various agricultural inputs and infrastructure as well as facilities for marketing and processing requires a regional approach which would take into consideration the differential demand for these facilities arising out of the differences in the levels of consumption by different sections of the people. The study of consumption and travel pattern has brought out the fact that there are less variations in the pattern of consumption of food items while it differs in the case of non-food items and agricultural inputs. Thus, the hierarchic pattern of clustering of facilities would seem to be the most efficient development strategy.

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