GROWTH DYNAMICS OF MEERUT DISTRICT

A DISSERTATION

submitted in partial fulfilment of the
requirements for the award of the degree
of
MASTER OF URBAN AND RURAL PLANNING

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JUNE, 1991

TO

INDIA, MY COUNTRY

CANDIDATE'S DECLARATION

I hereby certify that the work which is being presented in the dissertation entitled "GROWTH DYNAMICS OF MEERUT DISTRICT" in partial fulfilment for the award of the degree of Master of urban and Rural Planning Submitted in the Department of Architecture and planning of University of Roorkee, is an aunthentic record of my own work carried out during a period of eleven months i.e. from July'90 to May 1991 under the supervision of Prof. I.S. Chaudhary, Department of Architecture and Planning, University of Roorkee, Roorkee.

The matter embodied in this dissertation has not been submitted by me for the award of any other degree or diploma.

DATED : 8-06-91

Narendra Singh

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This is to certify that the above statement made by the candidate is correct to the best of my knowledge.

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CHAPTER - 1

BACKGROUND :

1.1 INTRODUCTION

The unmanageable concentration of migrant population and economic enterprise from the surrounding areas, and the unchecked growth of Metropolitan Delhi has led to the need of interlinking the process of growth and development planning for Delhi and its Region; and of equitably distributing the concentration of enterprise throughout the Region. Such planning will also be in support of the national objective that the privileged and unprivileged areas of the Region should derive equal benefits from national efforts towards planned development. The sub-Regional Development proposals for District Meerut presented in this thesis report, therefore, gain tremendously in importance as Meerut District of U.P. constitute an important sub-Region of N.C.R. Meerut District alone has 14.42% population of the total population and 21.44% urban population of total urban population of N.C.R. 26 urban centres out of 54 urban centres of N.C.R. are present in Meerut District. Also 1030 villages are present in Meerut District out of 6677 villages of N.C.R.

Without knowledge of the Growth Dynamics of a region we can not make a development proposal for the region. So, first growth dynamics have studied and then a strategy for development have made. In making development proposals for Meerut sub-Region attempt has been made to define such possibilities of economic development which can be profitably linked to the growth of regional specialisations, resources and manpower; and thereby bringing the economy of the Region to a self generating level. The sub-Regional plan provides for the development of all elements supporting balanced regional

growth by laying down the policy framework for future planned action.

The district Meerut sustains a population of 27,67,246 giving a population density of 708 persons per square kilometre with 2.50 per cent of the state's population. According to 1981 census the district occupies 11th position in population and 47th in area amongst the 56 districts of the state. The sex ratio is 838. The district comprises four tehsils namely Meerut, Baghpat, Mawana, Sardhana with 26 towns. Meerut tehsil is the largest while Mawana tehsil is the smallest. There are 18 vikas khand in the whole district.

1.1.1 Objectives :

1. To examine the natural and man-made resource base of the sub-region.
2. To examine the factors which contribute and act as obstacles to development and identify the critical factors for the future development of the sub-region.
3. To suggest a strategy for the development of the sub-region. (under the Guide lines of 'REGIONAL PLAN-2001 NCR') and detail out various inputs complementary to the development process.

1.1.2 Scope and Limitations of the Study :

1. To conceptually analyse the elements and process of growth dynamics of the sub-region.

2. To study the present level of development of the sub-region (i.e. Meerut District) and identify the comparative advantages of the sub-region for future growth.

3. To analyse the trends in terms of the following :

(a) Population

(b) Agricultural

(c) Industrial

(d) To examine spatial and functional relationships within the district and of the district with surrounding areas, particularly its interactions with the national capital Region.

4. Taking into account the factors helping or impeding the growth of the region, suggest a strategy for the future development.

5. To study of trends with respect to the items detailed out in the scope will be limited to the period 1961 to 1981.

6. As the area of the whole district was not smae in 1961, 71 & 1981 (Tehsils Ghaziabad and Hapur seperated from the

district on Nov. 14, 1976 to form the newly created district of Ghazibad) A comparison have been made on Tehsiles level.

7. Development proposals for 2001 will be suggested under the guide lines of 'REGIONAL PLAN - 2001 NCR'

8. Keeping in view the limited time available for this thesis and comparatively wide scope of the topic, the data base will be, by and large, confined to the secondary sources.

1.1.3 Methodology :

1. First the elements and nature of growth dynamics will be analysed, conceptualized with inferences from study of the published literature on the topic.

2. The conceptual study will be utilised for analysing present status of development and processes of growth in the Meerut District.

3. A strategy of the future development of the sub-region based on the growth dynamics of the district as identified earlier will be suggested.

1.2 History :

City history dates back to the period of Ramayan. The city was the site of the capital of ancient kings of Maharabhtra named Mai Danav, the daughter of whose married Ravan the king of Lanka. Story of Shravan Kumar is also related to this district. The region around Meerut is the great empire of Mahabharat. Seat of Indian Mutiny in 1857.

1019 Jama Masjid built by Hasan Mahdi Wazir of Gazni and was repaired by Humayun. This still exists. Raja Hari Dutt built fort wall (at present does not exist but its gates still stand as parts of the fortification).

1192 Mohamad Gori and Kutubuddin (social unrest)
Most Hindu temples (nearly all) converted into mosques.

1194 Kutubuddin erected Dargah near Navchandi grounds.

1396 Mangol invasion

1628 Erection of the red sandstone Dargah by Nurjahan in memory of a fakir named Shahpir. (stands to this day).

1714 The great Suraj Kund which is surrounded by sattipillar.

1775 Meerut was the scene of perpectual strife and was only rescued from enarchy by the exertion of an European military adventure sombre.

1803 All possession of Sindhia was ceded to the British.

1805 It was declared as a reseneous depopulated town with no trade.

1806 The cantonment was established.

1847 to 1853 Population spurt from 29,000 to 82,000

Meerut declared as district headquarters.

1884 Town Hall was constructed by the Duke of Cannaught.

1821 First church was erected.

1864 Municipality was established.

1892 Seat of higher education was established.

1867 Extension of the northern railway line was laid.

A bounded warehouse was established.

1895 Water supply established.

1901 Last settlement established by the British including the cantonment. Population 1,50,000.

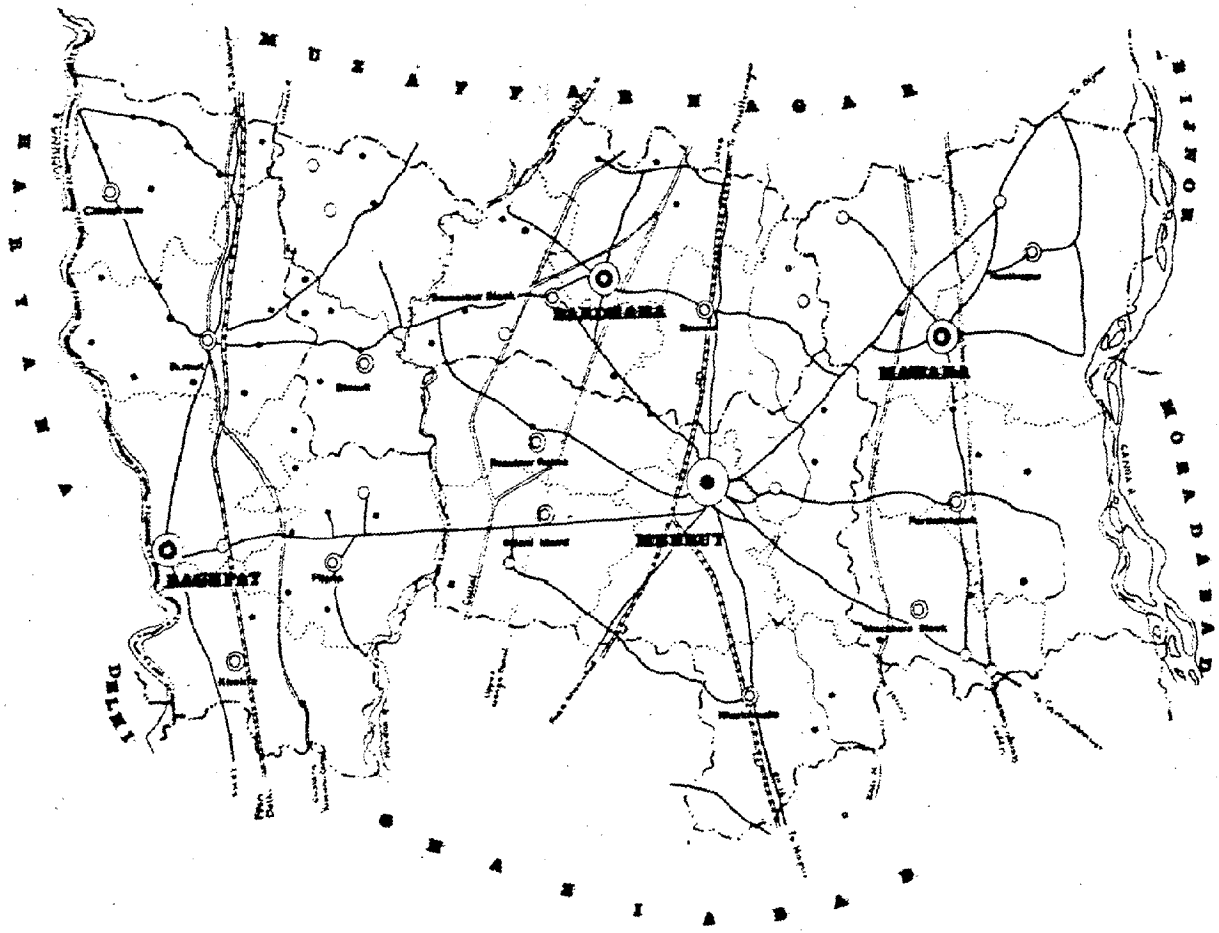
The city's demographic structure was characterised by slow growth till 1931. A sudden spurt between 1941 and 1951 caused mainly by the influx of imigrant refugees from Pakistan following the country's independence. Tendency of growth shown between 1961 and 1971 due to structural changes taking place in the city's economic base, increase in agricultural productivity which also brought about large number of tube wellsand pumping sets, use of scientific farming, inputs and improved implements and this has increased the need for urban trips for purchase and repair and servicing of implements, leading to increased rural - urban interaction. Meerut city has grown mainly in response to the felt needs of its agricultural hinterland and it is the latter which has been feeding and sustaining its growth. The city grew in the beginning merely as a service centre and around 1951, tertiary activity began to

grow and it became an important trade and commercial centre. This marked the change from the urban growth to the planned.

1.3 PHYSICAL SETTING

1.3.1 Location :

The district of Meerut is situated in the centre of Meerut Division. It lies between $28^{o}47'$ and $28^{o}18'$ north latitude and $77^{o}8'$ and $76^{o}7'$ east longitude. River Ganga forms its eastern boundary separating it from Bijnor and Moradabad district while river Yamuna forms its western boundary separating it from Haryana. On the north it is bounded by district Muzaffarnagar and on the south by district Ghaziabad. Both Ganga and Yamuna are important rivers of the district. Other rivers in the district are Kali, Krishani and Hindin. In the national physiography, Meerut district is surrounded by Himalayan ranges in the north and the extensive desert lands of Rajasthan in the south-west beyond the river Yamuna which is on the immediate west of the district. All these physical features have given Meerut a temperate climate that is generally suitable for large urban concentration. The high Himalayas in the north not only protect the district from the icy winds from Central Area and Siberia but also help to hold back the water ladden summer monsoons that blow northwards from the sea. Deserts of Rajasthan being not too far away, on the other hand tend to make district's climate hot and dry. Himalayas being the fountain head of all rivers that flow in the Indo-Gangetic plains in turn provide a perennial source of water supply to the mighty Yamuna and Ganga, flank this district on the either side.



BOUNDARIES STATE, DIST.
BOUNDARIES TEHSIL, VIKASKHAND
IMPORTANT METALLED ROADS
R.G. LINE WITH STNS. B.G.
RIVER AND STREAM, CANALS
HEADQUARTERS: DIST, TEHSIL, VIKASKHAND
URBAN CENTRE
VILLAGE HAVING POP 5000 & ABOVE

GROWTH DYNAMICS OF MEERUT DISTRICT

[MAP NO. – 1]

Narendra Singh
MHRP II (1990–91)
U O R
ROORKEE

1.3.2 Physiography :

The ground is more or less flat and generally level with the surrounding country but in certain places it is a few feet above or below it. Though the general configuration is flat there is considerable variation in level within the narrow strips, mostly due to excavation of borrow-pits and erosion.

Various streams both big and small flow from north to southwards in the district. Amongst them rivers Hindon and Kalinadi are the notable ones. Whereas the first flows longitudinally over the whole length of the district joining Yamuna, south of Jurajpur village, Kalinadi with several tributaries causes concern at each point where these tributaries meet this shallow stream.

River Hindon has no defined banks and therefore covers large areas. The land of both sides is subject to flooding during the monsoons. Area between Yamuna and Hindon cover approximately a floodable area of 16,000 acres.

Classification of the various types of the soil occurring in the district is as under :

(1) "BHUR" or Pure Sand - Mostly the riverian tract of the Ganges and Hindon and to the lesser width on the western bank of the Yamuna approximately southwards from Baghpat are pure sand areas.

(2) "SANDY LOAM" - It is sand mixed with clay, generally speaking areas which are very dry and have red sand also come up under this jurisdiction. Nearly 37% of the area under the district is under sandy loam belt.

(3) "DOMAT" - Loamy Soils - This includes all types of loam and is useful for all species. It covers 11% of the area of the district.

(4) "DHAKAR" - Clayey Soils - Mostly occurring on the stretches of the river Ganges it is localised to 2 to 3 miles wide strip occurring all along from Mawana southwards across Parishatgarh and Machra to Sambhouli. Species to which this soil is suitable are 'Babul' (Acacia Arbica) and 'Jamun' (Engenia Jambolana). Total area under this clayey type of soil is 9.5%.

(5) "KHADDAR" - It is stiff clay or Kural mitti. It has a large percentage of our clay with a certain percentage of iron in it. It is 13.4% in the district.

(6) BANGAR - Its occurrance in the district is confined to the zones and adjoining the pure sand belt of Gangetic riverian tract upto a width of two miles and certain areas east of the Ganges canal.

It also occurs nearly up to two miles on the eastern bank of the river Yamuna in the Chhaprauli and Baraut block of the Baghpat Tehsil.

This soil is good for timber (Dalbergia Sisso) 13.4% of the land is of Khaddar land.

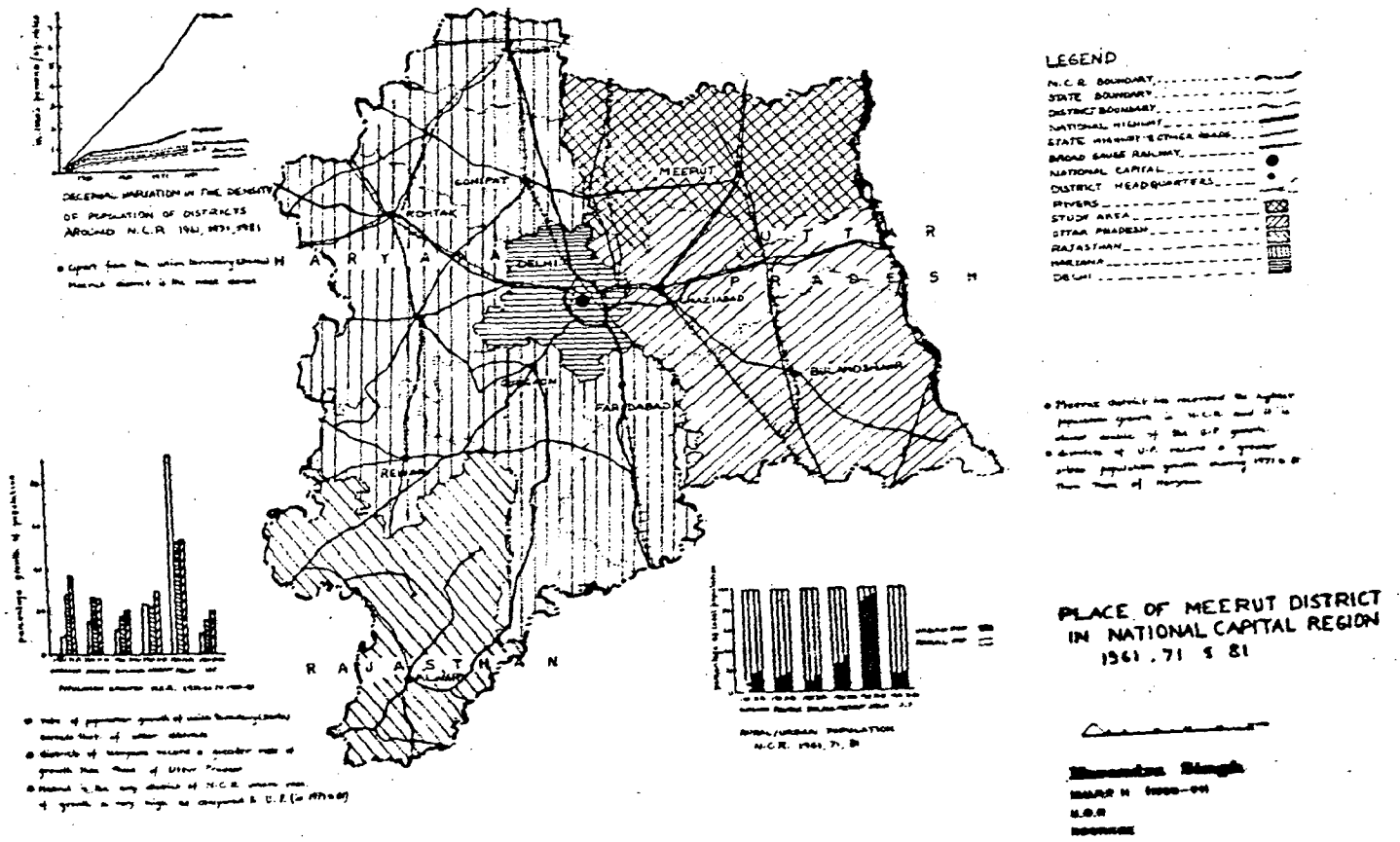
(7) "USAR" - In usar land the soil is impregnated with certain sodium salts. Specially sodium carbonate, where efforescence covers the surface with a white deposit called 'reh' which gives the plains their characteristic appearance. The main cause of the formation of 'Usar' is bad drainage which is generally due to

the presence of an impermeable sub-soil layer, e.g. 'Kankar' which prevents loaching. The water containing Salt accumulates on and near the surface and evaporates leaving the Salt deposits which turn the soil into "Usar".

Usar sands found in the old Meerut district (New Ghaziabad) is at the west in the Loni block and again at the point where the meandering course of the Kalinadi in the Hapur block meets the highway and railway embankments. These embankments run at right angles to the general slope of the country, with the result that surface drainage is prevented and waterlogging is caused. The total area under Usar land is nearly 144 sq.miles i.e. 6.2% of the old Meerut district area.

(8) "KANKAR" - is the name given to the calcium carbonate nodules found deposited on the surface of the soil or a few feet below it, in the form of an impermeable layer. The occufrence of this in this district is mostly of localised nature. Though no specific zones can be earmarked for this it may generally be said that kankar is found along the canals. This may be due to the fact it was excavated from the canal bed and deposited on the banks. As on usar soils nothing will grow successfully on kankar which is often found in association with 'Usar'.

Thus in conclusion it may be mentioned that indiscriminate excavation and borrow pits which added to the already flat terrain of the land in this district can cause untold harm and injury not only to the plant and vegetable life but also to the settlements themselves.



GROWTH DYNAMICS OF MEERUT DISTRICT

MAP NO. 2

With this in view and with this available data on the existing soil condition this already fertile tract of land can be more fruttfully utilized. An attempt at this has been made in the latter chapters.

1.3.3 Climate :

The climate of the district is typical of the plains in the Uttar Pradesh. Summer is hot and the temperature is slightly higher towards the southern than in the northern reaches of the district. Hot winds (100) are common in summer. Especially towards the western side sand particles are considerably disturbed on summer evenings and one can see suspended sand for several hours in the horizon. Lack of forests, level land contribute a lot to this condition which spread uninterruptedly over stretches of miles. Winter is more severe towards the western belt. Mist is almost a common occurrence in the entire district, especially in the arid lands.

Presence of a good canal system does exert a moderating influence on the severity of the climate and helps in reducing the frost damage though on the banks of the Eastern Yamuna it has been on record to be quite severe.

Rainfall usually breaks about the end of June and lasts till about the end of September, persisting sometimes even into October. The heaviest rainfall occurs during July and August and there are only a few showers in winter.

Once again due to the flat nature of the terrain saturation of ground due to good and persistence rainfall, presence of ground

due to good and persistence rainfall, presence of a strong canal and distributary system accentuated by a number of natural streams and nalas (e.g. Hindon, Kalinadi and its several branches) and the whole region being between the mighty rivers Jamuna and Ganga, drainage of the storm water causes a problem. This occurs all the more towards the end of July and continues to pose a problem for a physical planner right upto October and November.

Thus good rainfall with a flat topography accentuated by additional man-made factors have to be carefully accounted while setting any physical pattern for the development of this region.

1.4 MEERUT DISTRICT AND ITS RELATIONSHIP WITH NATIONAL CAPITAL REGION :

The unmanageable concentration of migrant population and economic enterprise from the surrounding areas and the unchecked growth of Metropolitan Delhi has led the need of linking together the process of growth and development planning for Delhi and its region, and of equitably distributing the concentfation of enterprise throughout the region. Such planning will also be in support of the national objective that the privileged and unprivileged areas of the region should serve equal benefits from national efforts towards planned development. Hence, Meerut district of Uttar Pradesh constitutes an important sub-region of the National Capital Region.

1.4.1 Characteristics :

The Meerut district unlike other parts of Uttar Pradesh is characterised by a highly developed rural as well as urban economy

and a developed infrastructure, both in respect of social community facilities and of means of transport and communication. Meerut district is one of the most developed part of the NCR and is a main centre of the widespread development and agricultural prosperity of the western part of Uttar Pradesh. Yet by virtue of its location next to the Union Territory of Delhi, the district vastly differs, in its socio-economical characteristics from the rest of State and Western Uttar Pradesh.

The district is connected efficiently with Delhi both by railways and roadways. As Delhi is the main entrepot of Northern India, the district has to depend mostly on it for the movement of both industrial and agricultural products. The aggregation of transport linkages with rest of India through Delhi has forced concentration of the industrial growth of this district along the main highways, specially along the Delhi-Meerut axis. The range and quantum of goods produced by this industrial area largely determined by the requirements of the markets in Delhi and such other outside markets which are accessible to the district through only Delhi. This arrangement has resulted in a well developed communicational and exchange network between Delhi and Meerut district. A similar dependency, in the marketting of agricultural products and associated agricultural ooperations with the district, on Delhi exists. After meeting, the local food requirements, the requirement of the local sugar and other traditional indigenous agro-based industries, the surplus agricultural and far products are geared to meet the demands of Delhi's large population. In exchange Delhi supplies to the district specialized services and sophisticated consumer goods. The total journey time from Delhi to

the farthest point in the sub-region is so short that no big centre of transportation and exchange has developed in the district. The nearest centres from Delhi to Uttar Pradesh are Mathura, Aligarh, Moradabad and Saharanpur, all of which lie outside the district.

The general relief of the Meerut district is a flat plain gradually sloping from north to south. This flat nature of soil while resulting in bad drainage at places, most problemetic out of these being the drainage area of river Hindon towards north of Modinagar, has prevented serious erosion being caused by rain and storm water. As a result of slower run off the soakage capacity of soil is high resulting in a high water table and good irrigation possibilities.

Flooding in this district is generally confined to areas along the banks of the rivers, particularly the Yamuna, the Ganga and the Kali (as shown in the map No. 7). Among the different components of NCR, the district holds greater percentage share of irrigated area and double cropped area to total sown area.

Geological, padeological and climatic characteristics of Meerut district are similar in nature to those generally found in the rest of the NCR (as details has been given in introduction part). The greater part of the district has benger variety of soil which is more suitable for agricultural operations. Soil fertility depends mainly on factors of water table and the presence or absence of calcarous concretions in the sub soil. In general the content of lime is adequate but the nitrogenous and organic content are low. Potash is adequate and phosphoric

acid is generally less deficient. In Meerut district the soils are classified as sand loams. The average annual rainfall is 18.1 centimetres and the soil index rating is 64.6 per cent.

1.4.2 Characteristics of Meerut District Economic Base and Natural Constraints in N.C.R. :

The economic conditions of Meerut district of N.C.R. present a transitional stage between the economics of Uttar Pradesh and Delhi Union Territory. The average per capita income of district during 1961 was about Rs. 330/- against U.P. State's Rs. 246/- and was much below the per capita income of Rs. 840/- of Delhi Union Territory. The economy of the district is based on well developed agricultural and other primary activities although significant development in industrial and commercial activities and mechanisation in agriculture has also taken place. Industrial and commercial centre in Meerut is also playing important role in the overall economy of the district. The district exports wheat, sugar, vegetables and other cereals and good stuffs including dairy products and also a large variety of industrial consumer goods like textiles, general machinery, industrial machinery parts and raw products. The industrial and commercial centres are linked with each other and to internal and external markets through efficient road and rail networks and well developed transport services. The district has no mineral resources and the industrial and commercial activities largely depend on the agricultural products. Ghaziabad and Meerut are the only two tehsils in the Uttar Pradesh sub-region where industrial development have taken place and there about more than 25% of the total workers are engaged in industrial manufacturing

activities while in other parts of Uttar Pradesh sub-region participation rate of working force is very poor (i.e. 32%) and is much below that of the State and National participation rates; the regions which can be ascribed to the higher participation of the working age population in education both at the preparetory and higher levels. In the urban centres of the district too the participation ratio of workers is lower than the respective state and national average. Primary activities dominate in the low size towns. Besides Meerut, secondary sector dominates in class III and class IV towns. participation rates in public, semi-public and miscellaneous occupations is quite high in almost all the urban areas.

The vast network of navigation in the district, originating from the Ganga and the Yamuna, has given it an edge over other parts of the N.C.R. in respect of agricultural development and general economic potential. Agrobased industries are highly developed in the district employing about 84% of the total workers in registered industries. The development of industry in this district has been confined to, Meerut urban area only. Industries like textiles, machinery, food and beverages, basic metal and miscellaneous industries have become highly specialised and localised. In this connection mention may be made of sugar mills, units manufacturing agricultural and sugar milk implements units producing edible and hydrogenated oils, cold storage and units engaged in canning and preservation of fruits and vegetables.

Trade and commerce forms an important component of the tertiary sector of the district. Such a dominance of commercial activities

is primarily due to the existance of large number of inter and intra region wholesale trades. Inter-related commercial activities such as banks, commercial firms, financial institutions have a fairly developed based in Meerut. There are several wholesale mandies dealing annually with Rs. 11,307 lakhs worth of commodities like food grains, pulses, vegetables, fruits, machinery, cloth and timber.

1.4.3 N.C.R. Characteristics of Human Habitate and Population Dispersal with Special Reference to Meerut District :

These settlements are generally nucleated in the form of rather large and a remarkably evenly spaced villages, having a common preference for new or old river bluffs (high portion) as points of settlements. The larger towns are generally bigger administrative and commercial centres.

Before 1961 there were as many as 16 urban centres and they increased up to 20 in 1971 in this sub-region and quite a large number of them were rural in character. In 1981 census number of urban centres reached 26.

The rates of growth of total population and also the urban population in the district of Meerut is lesser in comparison to other neighbouring districts of Uttar Pradesh. The distribution of urban centres in the N.C.R. shows that the Meerut district accounts for 26 of the total 94 urban centres. Urban growth in this district has tended to concentrate on the highway linking Delhi and Meerut.[1] Generally the

1. Town & Country Planning Department, U.P.; Meerut Bulandshahr Regional Plan; the Region; p. 12.

urban centres lying closer to Delhi are registering faster rate of growth.

Rural settlements are at present 1030. Nearly half (48.37%) of the villages fall in the range 500-1999. Of the remaining 32.61% fall in range 2000-4999. The proportion of villages with population more than 10,000 is very small (0.11%). The maximum number of villages have a density of 501 and above persons per square kilometre. Except along the floodable banks of the Ganga and Yamuna, the settlements are evenly planned all over the region.

1.4.4 Planning Objectives for Development of Meerut District within the Framework of the National Capital Region :

The objectives for the development of Meerut district have been set out with reference to following deficiences which are apparent in the present regional situation :-

a) Majority of the urban centres lack dynamism in production, income and employment opportunities affecting economic well being and growth.

b) Both the urban and the rural areas have inadequate availability, both in quantitative and locational terms of basic amenities, facilities, services and housing.

c) The sub-region (Meerut and Bulandshahr districts) has no effective machinery of sustained planning diversified development and for effective plan implemantation; and

d) The participation of local governments in the development of the sub-region through effective mobilization of local fiscal resources is extremely weak and imperceptible.

Planning objectives are based upon the expectations of population, physical, social and economic constraints of the sub-region (i.e. Meerut district) situation and also on the goals and objectives of regional development set for the nation and the state of which it is a part. To achieve these goals set out in the national and state plans and the N.C.R. and its existing development planning in the area should be based on the following objectives :-

a) The district should be developed for maximum utilization of natural and man-made resources. Specific attention should be given to achieve a balanced economic base to include industry, wholesale and retail trade, transport communication, education and professional jobs and to link inter and intra-regional exchange and interdependency relations. The success of this regional plan will be in the creation of employment opportunities for both basic and specialised skills so as to land rationality to the economic structure of the region as well as to rationalise the pattern of rural urban migration and services. The plan should make a definite attempt to transform the basic character of the regional economy from mainly agricultural and pre-industrial to

a more diversified one and to make a selective dispersal of economic activities and infrastructural aids. Attempt should also be made to infuse new and locally favoured economic activitites and relate these to the expansion and intensification of agricultural operations.

b) To promote orderly urban growth as a planned system of integrated functions in order to create, over a period of time, highly efficient urban complexes serving all the urban needs of resident population as well as those of regional population. The urban complexes should be self-sufficient to the extent that they will attract migrants from their own hinterlands and absorb the migrants, along with their naturally increasing population, by providing them with all the basic amenities of life. A national spatial development strategy should be put in operation and the development or linkages physical as well as socie-economic between the metropolitan cities, large and medium sized towns and the rural hinterland should be given priority. Restructuring of the settlement pattern must be attempted to attain a healthy social living and to provide a major break through in metropolitan and regional economy. Rural development must be stimulated through centrally located growth centres in various parts of this area.

c) Landuses should be so planned and organised that the optimum use of land for various purposes can be attained.

Land requirements for future urban expansion should be carefully conceived so that the fertile agricultural and cultivated areas are not encroached upon and are intensively utilised to meet the food requirements of a growing urban population.

d) The plan should propose an efficient intraregional system of transportation facilities linking its various functional units. Measures to facilitate long distance movement by rail should be expeditiously undertaken. Accesswise the plan should also strengthen the linkages of major transport arteries passing through the region with the neighbouring regions. Transport planning should be integrated with economic and production planning should be based on a proper evaluation of alternative modes of present and future transportation.

e) A closely related objective will be the planning and development of an efficient system of infrastructural services to support regional economic growth facilitated by the planned development of urban functions and regional economic growth. Special attention should be paid to the provision of water supply throughout the region for industrial, agricultural and domestic uses. The existing scarcity of power should be eliminated for speedy industrial development. Housing development should be used as an important tool in guiding urban growth and

accelerating economic development and a revolving funds should be created to reduce the backlog of housing. The development of regional recreational facilities should be given due prominance. Park development agencies should be set up. Zoning regulations and administrative action should be applied to prevent misuse of recreation land. For balanced development and a self-sustaining community life educational institutions, research organisations, hospitals, markets and shopping facilities should be adequately developed. As a sizeable portion of the expected population in the region will consist of immigrants to regional urban areas from within and outside the state, the need for initiating them in urban ways and institutions and providing for them the basic urban facilities should not be overlooked. Despite present economic constraints special attention should be given to create a healthy urban and nr rural environments. The ultimate goal should be to overcome slummy conditions in the existing urban centres, an environment in housing environment and the development in housing environment and the development of adequate service facilities. Because economic conditions wibl not allow for immediate total implementation of these objects, the plan should suggest interim solutions for the most acute problems and relate the progress of such solutions to a gradual raising of standards.

f) Co-ordinated and synchronous action to develop the physical, social and ecomomic structures should be achieved by the timely phasing of development programmes. Community support and participation is essential in the successful formulation and implementation of plans. Ways and means should be devised to ensure maximum public participation through local governments, civic organisation and various professional and trade organisations. Though the plan has a long range perspective yet attempt should be made at the very early stages to institutionalise the planning process. Legislative and financial support to the plan should be given the utmost importance so that its implementation leads to a logical, physical social-economic and institutional structures.

1.4.5 Policies of Sub - Regional plan Based on Regional Plan-2001 N.C.R. :

It is proposed to reside only 112 laks population out of projected population of 132 lakhs in Delhi. The extra population of 20 lakhs will be diverted to the near by areas by giving incentives and providing such type of infrastructure. To attained the objectives of regional Plan - 2001 N.C.R. following policies are proposed.

1) Planned development of priority towns and selected growth centres and to provide the social and public facilities to the level of Delhi metropoliton as guided by regional Plan.

2) To give the incentives for Industrilization for this region so that it can become self sufficient and to attract the trades of Delhi.

3) To improve the transportation and eommunication facilities on the basis of preference so that the approach of rural centres should increase and more and more agricultural products can be available for commerce.

4) Co-ordinated economic development of the whole region so that development of the rual area can be done according to their capacity.

5) To connect the different types of regional and sub-regional centres, service centres and basic villages by transport ways.

CHAPTER - 2

'A CONCEPTUAL STUDY OF REGIONAL GROWTH DYNAMICS' :

2.1 DEFINITION AND THEORIES OF REGIONAL GROWTH DYNAMICS :

Growth may be defined as 'an increase in the output of a region'.[1] Regional growth depends upon the growth of economic activities and can be defined as 'the sustained increase in the volume of economic variables of a spatial sub-system of anation'[2].

Similarly, regional growth dynamics can be defined 'as the intra and interactions of factors (like agriculture, population, industry and infrastructure) and forces (like workers or other variables which can accelerate the growth process) operating in, or out of the region and helping in the development'.

Before proceeding to different factors and forces it is very important to understand how a region can grow. Various theories like the Marxian theory of economic development, the keynesan theory, the Harrad-Domar models, Meade's neoclassical theory of economic growth, Rostow's stages of growth, the doctrine of balanced growth, the big push theory, Myrdals theory of backwash effects, the export base theory of growth, the Sector Approach and theory of development by stages, growth pole and diffusion theory are already developed and tested in various regions. Here a critical review of few selected theories of regional growth has been attempted.

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1. Horest Sicbert; Regional Economic Growth, p. 3.
2. Ibid, p. 4.

1. Myrdal(s Theory of Backward Effects :

Myrdal builds his theory of economic under development and development around the idea of regional inequalities on the national and international plans. To explain it he uses the notions of 'backwash and 'spread effects'. He defined backward effects as 'All relevant adverse changes..... of economic expansion in a locality. Included under this level the effects viz, migration capital movements and trade as well as the total cumulated effects resulting from the process of circular causation between all the factors, 'non-economic' as well as 'economic'. The spread effects refer to certain centrifugal 'spread effects' of expansionary momentum from the centre of economic expansion to other regions.

The main cause of regional inequalities according to Myrdal has been the strong backward effects and the weak spread effects in under developed countries or regions. He writes that 'higher the level of economic development that a country has already attained the stronger the spread effects will usually be'[1]. It means for the regional growth or development it is necessary to encourage the spread effects or strengthen the relationship between the periphery and the core. Both have to grow simultaneously at the same time, with the help of sach other.

2. The Export Base Theory of Growth :

The export base theory of growth is a long (and stable) relation between a region's export and its overall growth. The

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1. Jhingan M.L.; 'The Economics of Development and Planning'; p. 172.

The theory states that the growth of a region depends upon the growth of its exports in industries, implying of course that expansion in demand external to the region is a crucial initiating determinant of growth within the region. Thus an increase in the export base, a concept denoting collectively all the exportable goods and services of a region, sets off a multiplier process where the multiplier is equal to total regional output divided by total exports.

The theory regards export base as the only key factor determining the growth of the region. It does not pay any attention to the source of an increase in export demand. Thus the world economy is broken down into only two components - the region and the rest of the world.

It does not throw light on the growth process of the region; high levels of expenditure within a region by the Central Government may stimulate regional expansion. Region can grow without export base, say by migration. It is not necessary in all cases that with the growth of export base of region has to grow.

3. The Sector Approach :

This approach describes as decline in a portion of resources employed in agriculture and rise in manufacturing (secondary) and later in service (tertiary) industries. The rates at which these sectoral shifts occur is regarded as the main determinant of how fast the economy grows. The reasons for shifts are found on both the demand and the supply side.

The main limitation of the theory is that is only suggests a process of growth from some sectors to others on the assumption of a rise in per capita income. It offers no insights into the causes of growth itself and concentrates on internal development and neglects external stimuli to growth.

4. THE DOCTRINE OF BALANCED GROWTH :

It means balanced development of manufacturing industries and agriculture. Balanced growth, therefore, fequires balance between different consumer goods industries and between consumer goods and capital goods industries. It also implies balance between industry and agriculture and between the domestic and export sector. Further, it entails balance between social and economic overheads and directly productive investments, and between vertical and horizontal external economics. In fine, the theory of balanced growth states that there should be simultaneous and harmonius development of different sectors of the economy so that all sectors grow in unison.

For this, balance is required between the demand and supply sides. The supply side lays emphasis on the simultaneous development of all interrelated sectors which help in increasing the supply of goods. It includes the simultaneous and harmonious development of intermediate goods, raw materials, power, agriculture, irrigation, transport, etc., and all industries producing consumer goods. On the other hand, the demand side relates to the provision for larger employment opportunities and increasing incomes so that the demand for goods and services may rise on the part of the people.

The Theory of Development by Stages :

The theory of development by stafes concerns the role of natural resources in the development process of a region. A relationship is said to exist between the natural resource endowment and regional economic growth.

According to this approach there are five broad stages of development which in sequence are -

i) The stage of self-sufficient subsistance economy.

ii) The stage when with improvements in transport some trade and local specialisation is brought about involving simplevillage industries etc.

iii) The stage when with increased inter-regional trade a region tends to move through a succession of agricultural crops from extensive grazing, from cereal production, to fr fruit growing, dairy farming etc.

iv) The stage when agro-based industries are developed and for further industrialisation, mineral and energy resources become critical; and

v) The stage when a region specialised in tertiary industries for export.

Applicability on Study Region :

Myrdal's theory of backwash a effect is applicable in the Meerut district because of the following facts :-

Smaller centres are exchanging their goods and factor inputs with bigger centres including capital, specialised services and technical knowhow. In this way, Meerut has spread effects on the surrounding areas, resulting in development on both the settlements.

Export Base theory is fully applicable because of large quantity of finished products by agrobased industries exported to other region especially Delhi.

The sector approach is also applicable because of growth in industrial as well as tertiary sector.

Harrod-Domar models are not applicable because of unrealistic assumptions.

Development in Meerut district is also in line with the 'Theory of Development by Stages'. The study area has already crossed the four successive stages and the last stage, when a region specialises in tertiary industries and produces for export is in the way.

2.2 ELEMENTS AND CHARACTERISTICS OF RECIONAL GROWTH DYNAMICS :

There may be various elements of growth dynamics but the major among them are population, agriculture, industry and infrastructure. Growth in infrastructure is a resultant and dependant element on the above specified elements.

To understand the general inter and intra dependency some conceptual descriptive models have been developed (on the above specified elements).

Population :

It is a complicated term. So many sub-heads like population growth, concentration, distribution, literacy, working force, age and sex (and some other factors) and their changes are important for growth dynamics. To understand their interdependency, they are divided under two broad heads, namely one is direct factors or the basic factors which concern with the basic (growth) changes in population and other is indirect factors which are necessarily helping in more concentration or growth etc. for example attraction of job opportunities etc. (See Model No. 1).

Agriculture :

Agriculture of course is very important for the study area, because the level of development by and large depends on it. To understand the growth dynamics of this again direct and indirect factors have been taken. Direct factors are the soil fertility, better irrigation, improved seeds, tachnology and cropping. Of course these direct factors can increase the production but it we provide some indirect factors like better education, land consolidation, price stability etc. can help furthr in the growth. In the study because of limitation of data, some direct factors have been taken into consideration (See Model No. 2).

Industries :

Similar concept of direct and indirect factor has been applied hers (as given in Model No. 3). Direct factors are

availability of land, raw materials, skill, power, water, market and capital; and indirect factors are loan facilities, new involovation and deep transportation. And these both type of factors lead to Dynamic industrial growth.

Infra-structure :

This element has been divided into four major parts; namely trade and commerce, transportation network, network of irrigation and network of power lines.

The same concept of direct and indirect factors has been applied here and giving direction to the dynamic growth; and the dynamic growth of this element is more of less depends on the agriculture and industrial growth (See Model No. 4).

CHAPTER - 3

GROWTH DYNAMICS : ELEMENTS AND CHARACTERISTICS IN MEERUT DISTRICT :

As it is already mentioned in Chapter II about different sectors like population, agricultrue, industries and infra-structure, it is necessary to examine inter and intra-actions and further more their characteristics in Meerut district.

3.1 POPULATION SECTOR :

Before going into the details of population of the district it is essential to know the correlation of socioeconomic and physical characteristics of the planning area. For this purpose Meerut district may be regarded as the richest district of U.P. State in irrigation facilities (both rivers and canals) and transportation arteries (both highways and railways). Further, its climate and soil are very favourable for cultivation of rich crops. The district is linked with National Capital and functions in consonance with its socio-economic life. These elements, with the exception of the last i.e. nesrness to Delhi, have been helpful in the dynamic growth of population with the result that the area is very densely populated.

3.1.1 Distribution of Population :

As per 1971, census, Meerut has 24.4% of urban population the maximum proportion of urban population was in Meerut Tehsil (52.6 percent) and followed by other tehsil namely Baghpet, Mawana and Sardhana.

In all tehsil, rural population is higher than urban population except in Meerut tehsil. In respect of the percentage of urban population to total population Meerut has a higher rate of urbanisation than that of the U.P. State.

Rural population is distributed in 1030 rural settlements in Meerut district. These settlements are almost evenly distributed in the district. The largest number of rural settlements belonged to the population size range of 500-1999 persons, which was followed by the size range of 2000-4999 persons. Highest rural population is in Sardhana followed by Mawana and Baghpet. Total rural population of the district of Meerut was 19.03 lakhs in 1981.

For urban population; Meerut recorded a population of 3.7 lakhs in 1971 while it was only 2.8 lakhs in 1961. At present Meerut ranked eleventh among the 704 towns of Uttar Pradesh. which forms part of the ring towns in the Delhi Metropolitan area, The The distribution of urban population is given in Table No. 4. Meerut town group including kanker khera has registered a growth rate of 29.8% during 1971-81.

According to 1981 census the district sustains a population of 2767,246giving a population density of 708 persons per square kilometre with 2.15% of States population. Of district population 68.78% resides in rural area and remaining 31.22% in the urban area.

In the 1971 census, 5 towns have been added in the list of 18 towns in the district according to 1981 census Meerut Tehsil

has the largest population of 1061, 211 followed by Baghpat, Sardhana and Mawana. Mawana tehsil has the highest number of villages 305 (254 inhabited), followed by Meerut 268 (251 inhabited), Baghpat 252 (222 inhabited) and Sardhana 206 (193 inhabited). The distribution of town is 7 each in Mawana and Meerut tehsils and 6 in each Baghpat and Sardhana tehsils. Meerut urban area the district headquarter, has a population of 536,615 followed by Baraut M.B.(46,282) and Mawana M.B. (37,620). The population of all towns present is shown Table No. 4.

3.1.2 GROWTH OF POPULATION :

There has been an over all growth of 25.33 per cent in the district during 1971-81, 11.42 per cent in rural and 72.87 in urban areas. The highest growth rate of 29.50% is observed in Meerut tehsil and the lowest 21.66% in Baghpat tehsil. In rural maximum growth rate 15.71% is observed in Meerut tehsil and minimum 9.87% per cent in Sardhana tehsil while in urban it is maximum in Sardhana tehsil (271.50) and minimum in Meerut tehsil (44.83). Urban growth in the district has tended to concentrate on the major highways.

3.1.3 Density of Population :

Highest density can be observed in Meerut tehsil that is 1178 persons per sq. km in 1981 1045 in 1971 while it was only 656 persons per sq.km in 1961. Next in order comes Baghpet, Mawana and Sardhana.

There is not much change is rural density. But tremendous increase can be observed in urban areas during 1961-71. Tehsils of Mawana and Bagpat are having less urban densities as compared to district average. In total density of Sardhana & Mawana, tehsils are below the district average of 708 persons/sq. km in 1981. During last two decades (1961-81) population concentration is more where number of major towns are established because of their industrial base. The maximum number of villages have a density of 501 and above persons per squre kilometre. The proportion of villages having density 0-50 is very small.

3.1.4 Sex Ratio :

Sex ratio in rural area has decreased during 1961-81 from 853 to 831. But it increased in urban areas, showing workers migration with their families. At district level urban sex ratio increased from 805 to 816 during 1961-71 & from 816 to 854 during 1971-81. All tehsils had more than district average except Ghaziabad which was having only 780 females in 1971. This was the lowest figure which shows that workers were coming without their families as residential accommodation in the towns located in the tehsil was costly. Mawana tehsil has the sex ratio of 839 famales in 1971.

Overall increase of sex ratio in urban areas is helping in the social life of the workers (See Table No. 6).

3.1.5 Literacy :

Literacy at district level is 34.88% while it is 44.37% in urban areas. Literacy among females is increasing considerably.

Meerut and Baghpat tehsils are showing significant increase during the last decade. Apart from general literacy, there are nine professional colleges located in Meerut tehsils. A few other training centres are also operating in the district. The obtaining overall low levels of literacy, inspits of marked progress in the recent decades, remains a drag on the development of human resources.

3.1.6 Working Force :

A major proportion of workers is engaged in agricultural pursuits. Except for Meerut and Baghpat, the rest of tehsils have more workers in primary sector in comparison with the district corresponding figures of 55 percent of the total working force. Some tehsils of the district such as Meerut and Sardhana have a higher percentage of total workers engaged in industrial activities as against the district's figure of 18%. The tertiary sector has developed much more than the secondary sector. The percentage in tertiary of Meerut tehsil was 45 in 1971. Next to this Baghpat (18%) and Sardhana (17%). The lowest figure was in Mawana tehsil i.e. 16%.

According to 1981 census the main workers in the district constitude 27.68% of the total population with 27.71% in rural and 27.61% in urban. The proportion of workers among males and females is 49.2% and 1,98% respectively. Participation of of female marginal workers is higher in rural areas of the district.

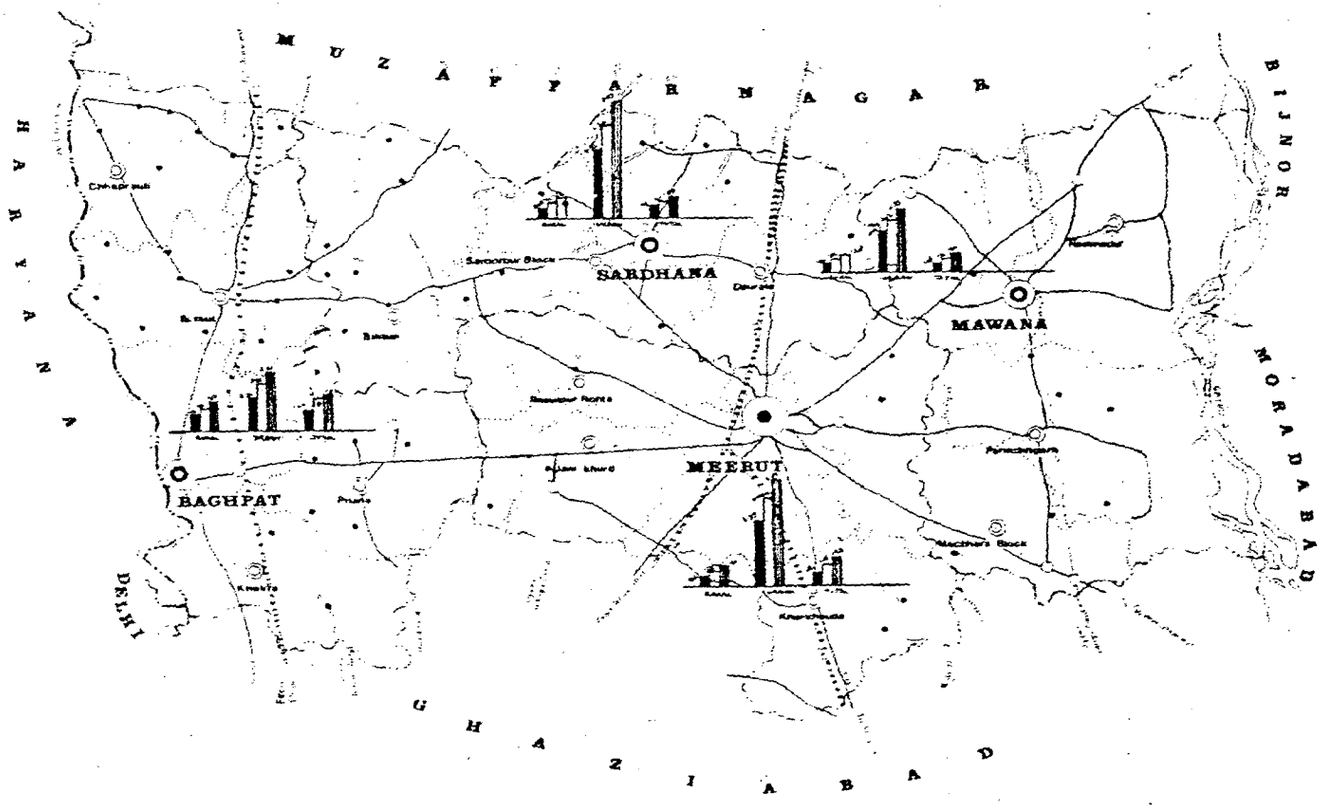
Non workers in the district constitute 71.71% of the total population. Among run workers 71.50% are in rural and 72.17% in

urban areas. It is also observed that the proportion of non workers in rural and urban areas is almost the same. It is nearly 50% per males and 97% for females.

In 971 the proportion of rural working force to total rural population in district was 34% which shows a lower level of participation in rural areas (as compared to U.P. i.e. 403%) largely due to higher attendance of school going age group in schools. Similar trends are reflected by study of working force in urban areas where the percentage of the working force to total urban population is 30.1% in the district during 1971. In other words the working force in urban areas comprises a smaller proportion of the total population in comparison to the rural areas.

3.1.7 Migration :

The number of life-time migrants were 350,868 in 1961 and it was 12.9% of the total population during 1951-61. Out of 3.5 lakh immigrated persons 61% have migrated to rural areas. The higher number of migrants to the rural areas is mostly due to marriages outside the district. But migration to urban areas is mostly for employment. Among the total migrants female population constitutes about 78% and this is largely due to marriages. Male migrants predominantly go to urban areas. The number of female migrants per thousand males is 2460 (as given in Table No. 9). The number of migrants to the district from different parts of India other than U.P. and international areas is about 78 thousand.



LEGEND-

DENSITY IN '000' PERSONS / Km² in 1961

DENSITY IN '000' PERSONS / Km² in 1971

DENSITY IN '000' PERSONS / Km² in 1981

OBSERVATIONS

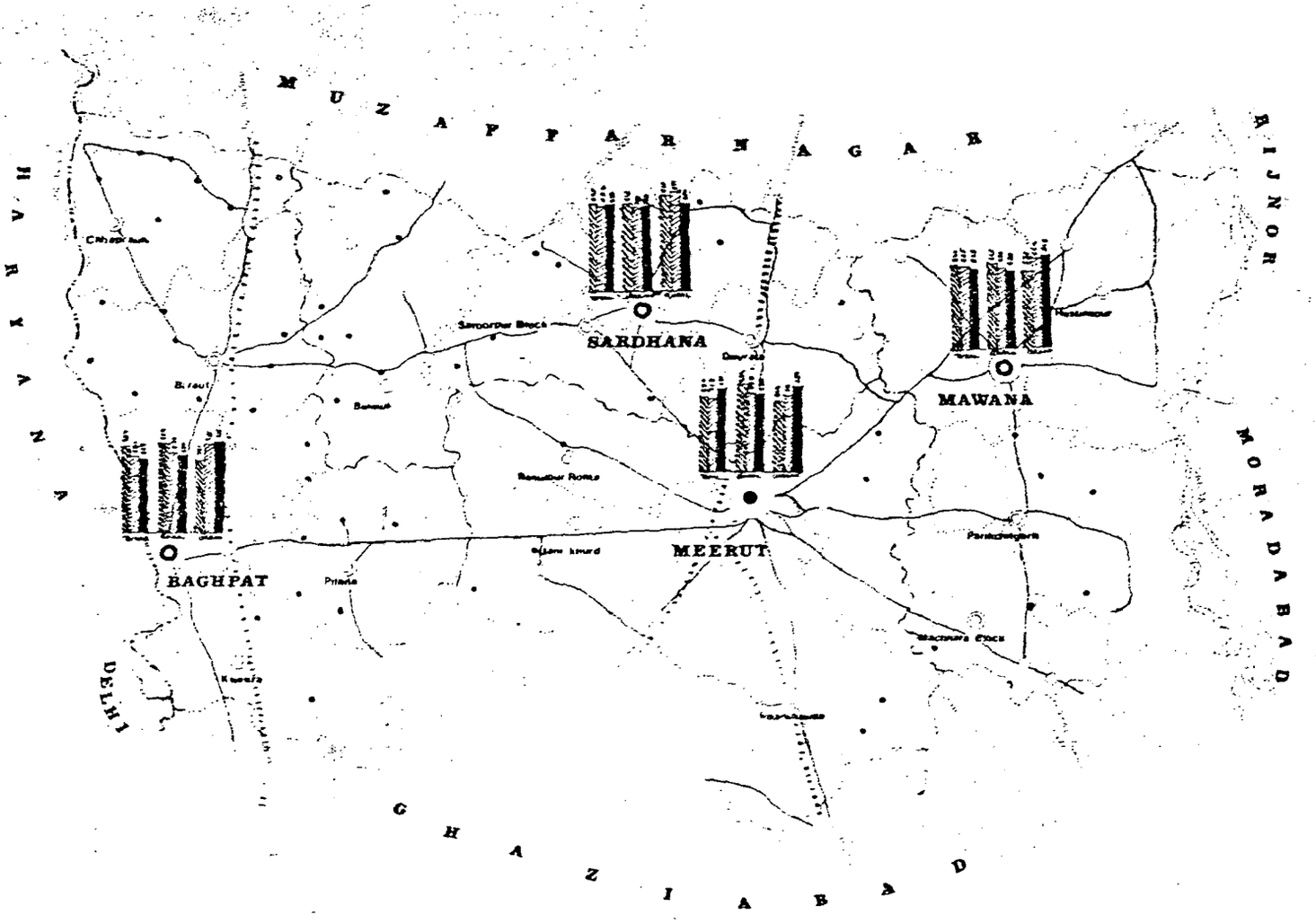
- Meerut Tehsil has highest density as compared to other Tehsils
- Urban density is very high in Sardhana & Meerut Tehsil
- Density increase is highest in Sardhana, next in order comes Meerut, among these areas

CHANGE IN DENSITY 1961 TO 1981

GROWTH DYNAMICS OF MEERUT DISTRICT

[MAP NO. 3]

Narendra Singh
M.U.R.P II (1990-91)
U O R
ROORKEE



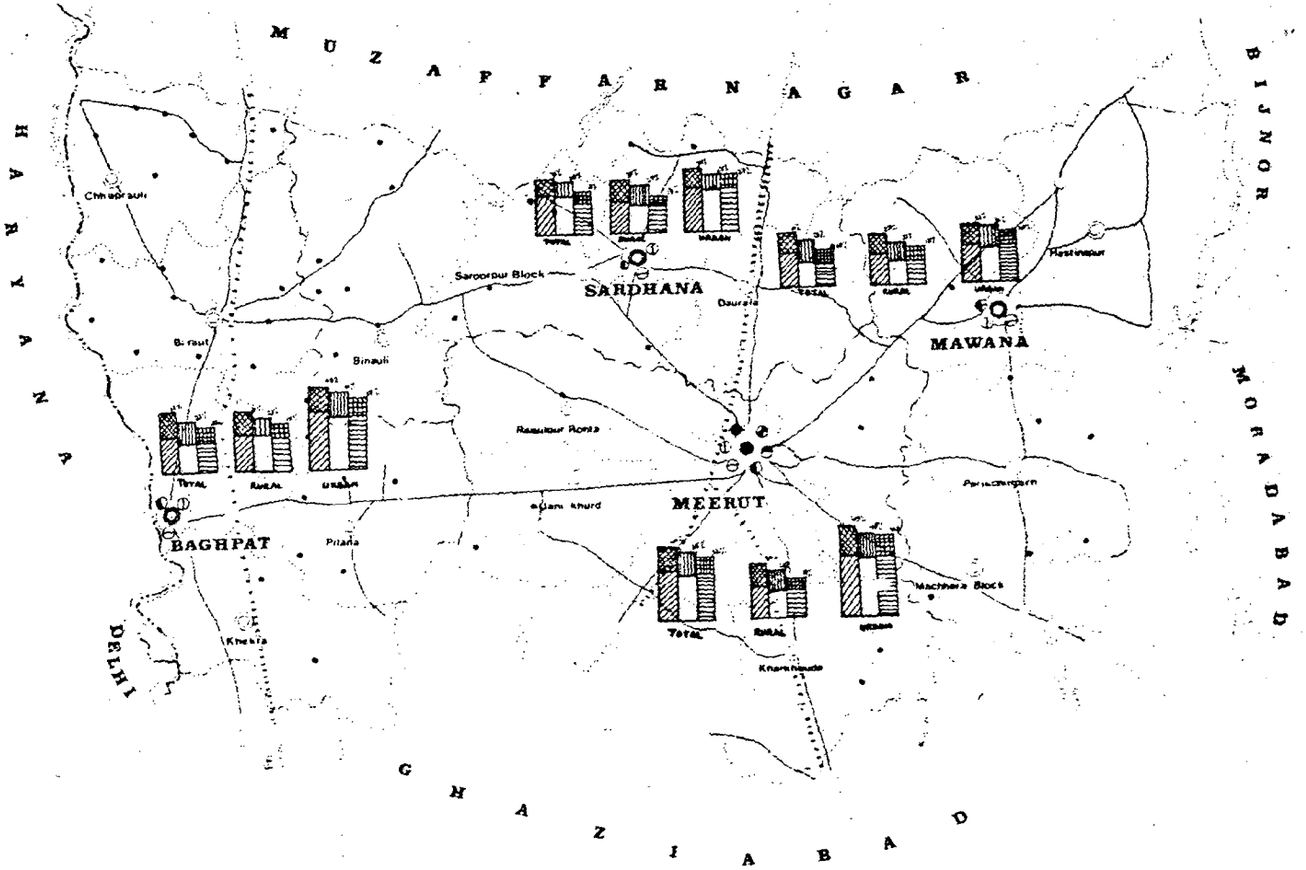
BOUNDARIES STATE, DIST. .....
BOUNDARIES TOWN, PARGANAS .....
IMPORTANT METALLED ROADS .....
RLY. LINE WITH STNS - B.G. .....
RIVER AND STREAM, CANALS .....
HEADQUARTERS DIST., TEHSIL, PARGANAS .....
URBAN CENTRE .....
VILLAGE HAVING POP. 5000 & ABOVE .....

POPULATION

GROWTH DYNAMICS OF MEERUT DISTRICT

[MAP NO. 4]

Narendra Singh
M.U.R.P. II (1990-91)
U.O.R.
ROORKEE



LEGEND -

BOUNDARIES STATE, DIST.
BOUNDARIES TEHSIL, VIKASKHAND
IMPORTANT METALLED ROADS
R.L.Y. LINE WITH STNS. - B.G.
RIVER AND STREAM, CANALS
HEADQUARTERS - DIST., TEHSIL, VIKASKHAND
URBAN CENTRE
VILLAGE HAVING POP. 5000 & ABOVE
University/Special Training Centre/Prof. Colleges
Colleges/Hr. Sec. School/Middle School
Literacy 1981. Male/Female
Literacy 1971. Male/Female
Literacy 1961. Male/Female

OBSERVATIONS :-

- Literacy at district level is 35% which is 45% in urban areas.
- Literacy among females is increasing.
- Literacy has increased among all levels.
- Educational infrastructure is adequately available.

Total Rural Urban

MEERUT DISTRICT

POPULATION

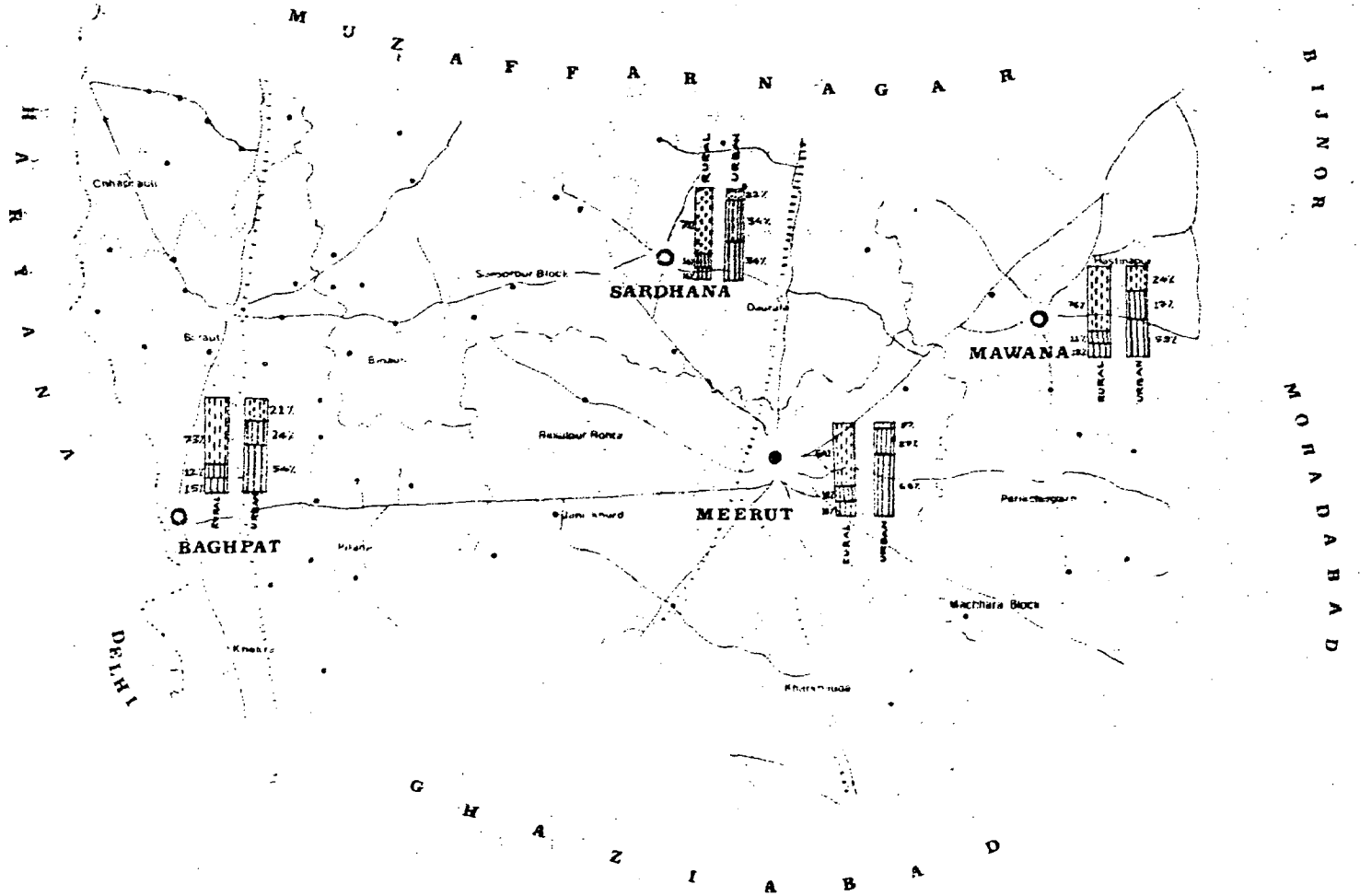
EDUCATIONAL FACILITIES - 1981

Narendra Singh
M.U.R.P II (1990-91)
U O R
ROORKEE

43

GROWTH DYNAMICS OF MEERUT DISTRICT

[MAP NO. 5]



LEGEND

BOUNDARIES STATE, DIST .....
BOUNDARIES- TEHSIL, VIKASKHAND .....
IMPORTANT METALLED ROADS .....
RLY. LINE WITH STNS. B.G. .....
RIVER AND STREAMS CANALS
HEADQUARTERS DIST. TEHSIL, VIKASKHAND
URBAN CENTRE
VILLAGE HAVING POP 5000 & ABOVE
WORKERS IN PRIMARY SECTOR
WORKERS IN SECONDARY SECTOR
WORKERS IN TERTIARY SECTOR

OBSERVATIONS

- More than 60% of the total working force is engaged in tertiary sector (urban area only), except Sardhana Tehsil (+3%)
- In rural areas, more than 70% of working force is engaged in primary sector
- Workers in secondary & tertiary sectors are comparatively less (4% to 25%) in rural areas, while in urban areas they are more than 75%

GROWTH DYNAMICS OF MEERUT DISTRICT

[MAP NO. 6]

POPULATION
WORKING FORCE 1981

Narendra Singh
M.U.R.P II (1990-91)
U O R
ROORKEE

Out of this Punjab State alone shares 58.8% of the total tmmigrants. Delhi union territory with 25% covers next in order. As a result the cultural linkages of this district with rest of N.C.R. is very strong.

Overall enough human resources is available in the district which can contribute in its development. Further more other elements like fertile soil, good climate and organised industrial activities are helping and have potentials for the future development.

The main hurdles associated with population are :

1. High dependensity ratio i.e. 43.5% of total population (having the population of 0-14 and 60 + years of age).
2. Skill quality is also low.
3. Literacy level is also low.
4. The main problem is that of urban population growth and its concentration at a few points.

It is proposed to diversify the population concentration from major urban centre Meerut to small and medium size towns (Mawana, Sardhana, Baghpat and Baraut) in the district.

3.2 SETTLEMENT SYSTEM :

The whole district comes in N.C.R. Although due to the effect of Delhi. The development of this region has grew up but due to the presence of more facilities in Delhi. The development of this region has reached less in comparision to Delhi union territory. And due to this reason Migration is taking place to Delhi. So seeing the increasing population of Delhi, development at Normal

level is recommended in regional plan. And this can be achieved by the development of urban centres near to Delhi. For the balanced development of the sub-region it is necessary to develop the present urban centres and basic villages on the basis of priority.

3.2.1 URBAN SETTLEMENTS :

According to 1981 census there were 23 urban centre in district Meerut. Urban rural settlement ratio was 1:40 in this sub-region.

URBAN SETTLEMENTS OF MEERUT DISTRICT OF N.C.R

Sl. No.	Classification of urban settlement	No. of urban settlements	% of urban population of the district
1.	First	1	62
2.	Second	-	-
3.	Third	4	16
4.	Fourth	10	14
5.	Fifth	8	8
		23	100

Source : Regional Plan - 2001 N.C.R.

3.2.2 RURAL SETTLEMENTS AND FACILITIES :

In this sub-region standard of public facilities is good, Drinking water is available in 100% villages. Electricity supply is in 94% villages.

According to 1981 census, educational facilities were available in 87% villages. But the distribution of educational facilities is unsatisfactory. Meerut district of NCR has least healthfacilities (10.5%) in villages. Out of the three distficts of NCR of U.P. sub-region.

PERCENTAGE OF PRESENT FACILITIES IN RURAL SETTLEMENT IN 1981

Rural settlement	Educational	Health service	Post & Tel.	Communication	Drinking water	Electricity	Link with metalled Roads
920	86.70	10.54	28.36	37.60	100.00	94.02	55.00
	(798)	(97)	(261)	(346)	(920)	(865)	(336)

Source : Census 1981.

3.2.3 PROBLEMS AND PROPOSALS :

1. Rural area of this sub-region is more developed by economic and infrastructure point of view in comparison to the other rural area of U.P. Per Hectare agricultural production is more in this area. There is lack of agricultrual markets and also the distribution is unbalanced so it is necessary to provide these facilites.

2. Due to the improper distribution of rural settlements these settlements are far away from each other. Hence it is proposed that basic facilities of low standard should be provided to each village and the higher standard facilities should be provided in service centres as well as in Basic villages.

3. Some training programmes should be arranged in rural area for non-agricultural workers so, that their works can be improved and employment opportunities can increase.

4. Some ribbon development are emerging near the urban centres which is developing on both side of the road and the back portion of these rural settlements remains undeveloped. So it is necessary to locate these settlement by preparing a village development plan and the land uses in these village should be restricted.

5. Housing problem is also accute in villages. So it is proposed to provide middle and lower class housing facilities specially for economically weaker section.

6. Some training programmes should be arranged for rural population so that they can participate and understand the working of different rural bodies.

3.2.4 FUTURE PLAN OF SETTLEMENT SYSTEM :

Taking in to consideration the basic object of regional plan 2001 NCR that the population of Delhi should be limited to 112 lakhs upto 2001 (projected population 132 lakhs for 2001).

The extra population out of which 12.4 lakhs is recommended for U.P. sub-region should be diverted and accomodated outside Delhi. To accomodate this extra population we have to prepare a strategy.

To solve this problem different growth centres have been sellected at different levels. By this type of development system a continuous and balanced development of rural and urban area will occur. It is estimated that economic development is not possible unless the goods prepared by villagers are demanded by the trados. In spite of this where the major part of population reside in villages the economic development of the region will be directly connected to village area development. Growth centres of different levels will be selected for specific work and different type of public facilities will be provided at priority basis. The population and probable work at different level of settlement will be as following :

Level of settlement	Population
1. Regional centre	3.0 lakh and above
2. Sub-regional centre	0.5 to 3.0 lakhs
3. Service centre	10,000 to 50,000
4. Basic village	less than 10,000

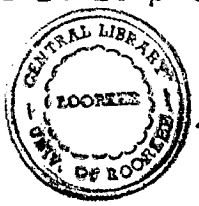
It is recommended that the economic development in the secondary and tertiary sectors should be done in the regional centres.

In these centres such type of infrastructure should be developed so that they can attract the trade and industries of Delhi region. The regional centres will be first class industrial centre. On the one side the service centre will work as an agro-service centre for village area on the other side they will work as Godowns and marketing centre for agricultural goods. Service centre and basic village will depend on each other. Development of basic village will be done in such a way that instead of the availability of daily uses goods there will some arrangement for seed stores, fertilizers stores, insectisides stores, rural godown, agricultural instruement, Pump set and diesel etc. their repiar can be done there.

3.2.5 SELECTION OF CENTRES :

Regional centres are selected by regional plan 2001 NCR and the selection of sub-regional centre, service centre and basic village will be done by sub regional plans of different states and union territority of Delhi coming under NCR.

The selection of different growth centres will be done on the basis of present situations of revenue and development, administration, size of population, male-female ratio and literacy ratio, growth per decade from 51 to 81, participation ratio, industrial working force, rate of migration and education, health, reads, rail, water supply, electricity, financing institutions. In district Meerut only one regional centre "Meerut" has selected by regional plan-2001 NCR. According to 1981 census population of Meerut is 5.36 lakhs and for 2001 it is proposed to be 15.50 lakhs..



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On the basis of previously discussed points following 5 sub-regional centres, 12 service centres and 26 basic villages are proposed. These all growth centres are shown in map No. 18...

SELECTED SUB-REGIONAL CENTRES IN DISTRICT MEERUT

Sl. No.	NAME	POPULATION 1981	POPULATION FIXED FOR 2001 in (lakhs)
1.	Baghpat	17.157	1.00
2.	Baraut	46,292	1.00
3.	Sardhana	30,138	1.00
4.	Mawana	37,620	1.00
5.	Kithor and shahjanpur	22,658	0.75

SELECTED SERVICE CENTRES IN DISTRICT MEERUT

Sl. No.	NAME	POPULATION, 1981	POPULATION FIXED FOR 2001 IN LAKHS
1.	Khekra	24,984	0.50
2.	Amin Nagar sarai	6,837	0.20
3.	Chhaprauli	13,800	0.25
4.	Karnawal	9,895	0.25
5.	Daurala	9,146	0.25
6.	Dhaughat	10,019	0.25
7.	Hastinapur	11,637	0.25
8.	Phalauda	10,357	0.25
9.	Parikhit garh	11,328	0.25
10.	Siwal Khas	10,278	0.25
11.	Kharkhauda	7,808	0.20
12.	Incholi	7,582	0.20

SELECTED BASIC VILLAGESIN DISTRICT MEERUT

Sl. No.	NAME	POPULATION 1981	POPULATION FIXED FOR 2001 IN LAKHS
1	2	3	4
1.	Rataul	8,110	0.17
2.	Pilana	4,470	.07
3.	Dhanaura silwar Nagar	7,215	0.11
4.	Saroorput	9,429	0.14
5.	Khurtana	5,152	0.08
6.	Ramala	6,157	0.11
7.	Tanda	2,975	0.06
8.	Gotaka	2,899	.05
9.	Dbathua	5,284	.07
10.	Sakauti	4,568	.07
11.	Lawar	11,535	.20
12.	Daha	9,330	.15
13.	Tikri	11,315	.16

1	2	3	4
14.	Binauli	5,128	.08
15.	Bamnauli	8,505	.12
16.	Mawi Kalan	3,694	.07
17.	Aurang Nagar Rardhana	6,111	.10
18.	Mawana Khurd	3,977	.05
19.	Jai	3,464	.07
20.	Sathla	5,054	.07
21.	Laliana	5,586	.10
22.	Rasulpur Rohta	7,767	.12
23.	Jani Khurd	5,434	.10
24.	Sisauli	3,678	.07
25.	Sarawan	4,394	.07
26.	Atrara	5, 358	.08

3.3 GROWTH DYNAMICS OF AGRICULTURE :

Meerut district is one of the richest districts of Uttar Pradesh. It being flanked by the rivers Yamuna and Ganga and in general being blessed by a favourable weather, a flat but uniformly

and gently sloping southwards terrain, a network of canal system, a good and high water table, and having the added advantage of being less exposed to the vagaries of the rivers Ganga and Yamuna, Meerut district rightly deserves to be called the richest in the Upper Doab region.

A detailed examination has been made here of the following elements namely physiography, ground water conditions, soils, irrigation types, cultivable area, irrigated area, cropping pattern and shift from 1961 to 1981 and land use.

Physiography and climate have already been described in detail in first chapter. But the broad characteristics of the soils are given here -

1) Soil is fertile in whole of the district and can specialize in wheat and sugar-cane cultivation.

2) Sandy loam soil covers 36% of the total land. This can be a very good resources for the cultivation of wheat and sugar cane, if sufficient irrigation is there i.e. already available in the district.

3) Except western and eastern belt of the district (as marked in map) rest is good for three types of crops namely -

   i) Cereals
   ii) Sugar cane; and
   iii) Wheat.

4) Soils which are along the eastern and western corners of the district are of pure sand. But because of availability of well irrigation and high water table, the said area is under cultivation presently.

5) The main soil types are pure sand (23%), clayey soil (9.5%), Khadar clayey soil (13%), sandy loam (36%), Domet or loamy (11%) and Khadar stiff soil (13.4%).

With the fertile soil climate is also a supporting element in developing agriculture in the district and above two elements are further supported by the flat terrain of the land which is resulting in dynamic growth of agriculture.

3.3.1 Ground Water Conditions :

This district as a whole is one of the richest in the doab (area flanked by the two rivers Jamuna and Ganga) zone. These Himalayan rivers Yamuna and Ganga after entering the Indo-Gangetic plains in the district of Saharanpur flow in a level terrain. This explains to an extent the fact that these rivers hardly dry off to any great extent at the Meerut district. This parrenial nature of the rivers added to an age old canal system have considerably strengthened the water table of the district.

In general the water table is higher on the canal banks than in the surrounding country. Its depth from the surface varies from as little as 3 feet to as high as 30 or 40 feet.

Approximately 80% of the area is benefitted by an effective high water table so much so that nearly all this land poses a drainage problem during and just after the monsoon.

Nevertheless with the help of the cheap hydroelectric power that is readily available a considerable amount of the ground water and subsoil water is being used by the tubewells for irrigation purposes. This has, to an extent, caused the depletion of the water table. In evidence of this may be mentioned that in the spring levels of the open wells of the Daha group (at Binauli Block) due to the concentration of the tubewells and dry years have caused depletion of ground water table, ranging from 1/2' to 10'. This occurance was between 1938 to 1948. Since 1948 it has been more or less static up to 1973. This sudden drop and subsequent steadying has been explained by the fact that beyond a certain general depression the rate of recuperation more or less balanced with the rate of pumping.

Again in the case of Bhatipura group the spring levels along the Meerut Parikshitgarh road have been continually rising while those along the Meerut Garhmukteshwar road have shown a tendancy to fall till 1958. Since then they has been more or less static.

The ground water is mostly potable. Water except at some places where saline water has been indicated.

Thus while setting up any physical pattern for new settlements specially for industrial locations water pollution due to the incidence of the industrial wastes getting mixed up with the high

ground water table as also depletion of the water table already taxed by the demands of the tubewells irrigation have to be taken care of. This has been taken into the later chapter dealing with industrial locations.

3.3.2 Land Utilization :

Land under water is 3.22% of the total geographical area in the district. Highest percentage of the same is in Mawana and Baghpat tehsils (4.0 to 5.0%) and rest tehsils have 2.5 to 2.6%. Land under settlement, roads etc. under this use is 5.5% at the district level. Two tehsils namely Meerut (6.22) and Baghpat (5.6%) are above the average and rest are below with percentage range of 4.5 to 4.6% of total area during 1987-88.

i. Grave Yard :

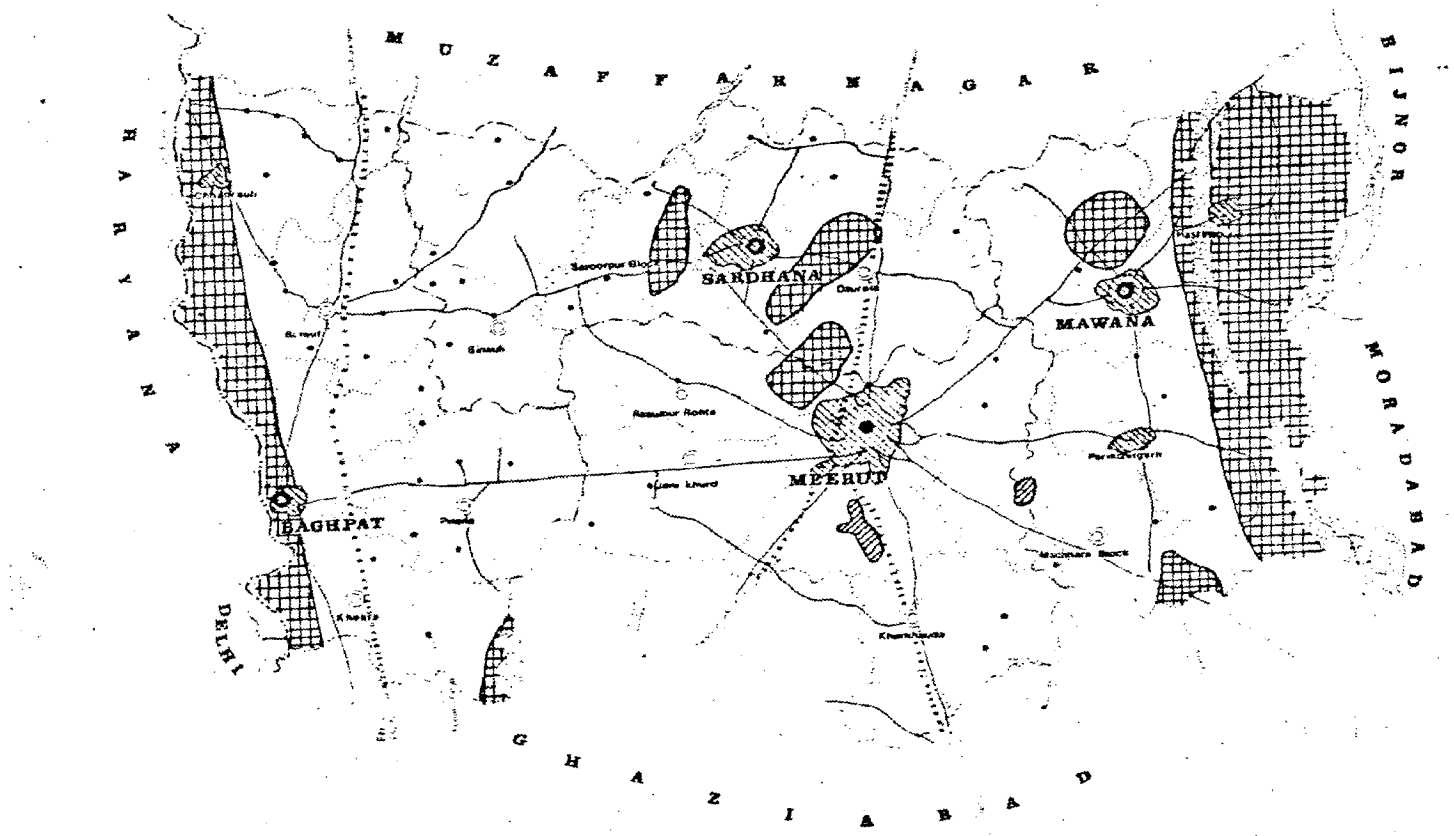
Land undef grave yard is also considerable with 0.3%. All tehsils have less than 0.33% which is the highest figure in Meerut district.

ii. Uncultivable Land :

At district level it is 3.4% of total geographical area. This is highest in Meerut tehsil (4.3%). This category of land utilization is lowest in Baghpat tehsil; Mawana and Sardhana have 3.2 3,2 and 2.3% respectively.

iii. Garden :

Area under garden is 0.61 at the district level while it is highest in Meerut tehsil (1.36%). And other tehsils contain only less than 0.5%.



LEGEND

BOUNDARIES- STATE, DIST. ..... ——

BOUNDARIES- TEHSIL, VIKASKHAND ..... ——

IMPORTANT METALLED ROADS ..... ——

RLY. LINE WITH STNS. - B.G. ..... ——

RIVER AND STREAM, CANALS ..... ——

HEADQUARTERS- DIST, TEHSIL, VIKASKHAND ..... ⊙

URBAN CENTRE ..... ○

VILLAGE HAVING POP 5000 & ABOVE ..... •

FORESTS ..... ▨

AREA UNDER SETTLEMENTS ..... ▨

FLOODED AREA ..... ▨

BARREN LAND ..... ▨

AGRICULTURAL LAND ..... ▨

OBSERVATIONS

- Urban centres (census town, municipality, municipal corporation) in (1-4), (4-10), 10-25 categories.
- Settlements with a population (67% of total population area) above district level has an agricultural economy.
- Flooded area is along the banks of the river covering one side & upper side in the district.

LANDUSE PATTERN

GROWTH DYNAMICS OF MEERUT DISTRICT

[MAP NO. 7]

Narendra Singh
M.U.R.P II (1990-91)
U O R
ROORKEE

iv. Forest :

Area under forest is highest in Mawana tehsil, next followed by Meerut tehsil. District average is 0.42%. In this land use area under raw forest has to be taken. Becuase district got forest based industries in the district.

3.3.2.1 Cultivated and Culturable Land :

At the district level 86.62% area is cultivable and highest percentage can be observed in Sardhana tehsil (89.4%) and this is followed by Baghpat (88.0%) and rest tehsils contain 85% of total area in 1987-88 (as given in Table No: 17).

3.3.2.2 Irrigation by Types :

Highest area is irrigated by government canals (49%) of total irrigated area. Next in order comes minor irrigation which is of 32.5%, than comes State tubewells. 17%.

3.3.2.3 Cultivable and Irrigated Area :

Both cultivable and irrigated area percentage is very high in the district as compared to state average. Total area cultivated in the district was 86.6% of geographical area in absolute terms total acreage of the district is 1,546,679 whereas 1,369,53 acres are cultivable. Unirrigated area is increasing more than 35% of the geographical area. These tehsils got highest potentials for the future development. Here irrigation can be dynamics if it is utilized for area which is not under irrigation at present time.

3.3.3 Cropping Pattern :

The distribution of the crop pattern and acreage under each type are given in table No. 18. It is noted that in tehsil Mawana the crops wheat, pulses and sugar cane are equally concentrated. Sugar is predominant at Chaprauli, Sardhana, and parts of Meerut tehsils. Predominance of pulses is in part of Sardhana tehsils. Tehsils Baghpat account for the wheat zone in the district.

There are many gardens scattered all over the area, usually located on areas of good soil. The area of the gardens varies from about half an acre to about 22 acres and they are mostly in good condition while blocks Baghpat Meerut, Hastinapur, Parikshatgarh claims some of the best gardens. The chief species grown in the area are mango, guava, peach, loquat, malta, graps, fruit, orange and papitha.

Sugar cane is a perennial crop where as wheat, potatoes and all fruit trees are seasonal and two seasonal. Tobacco, cotton, maize, barlay, jowar, peas and pulses are all hot weather and seasonal crops in this area.

The duration of the Kharif crops in April to September whereas Rabi crop in October to March. Besides these Jha Kharif and Rabi occur between September to January and January to April respectively.

When it is compared with the pattern of crop rotation from 1961 to 1981 the interesting thing comes that there is a shift from cereal crops to cash crops (Sugar cane).

Overall it is very well known fact that agriculture is playing an important role in the development of the district. The following factors and forces are helping in the development of this sector.

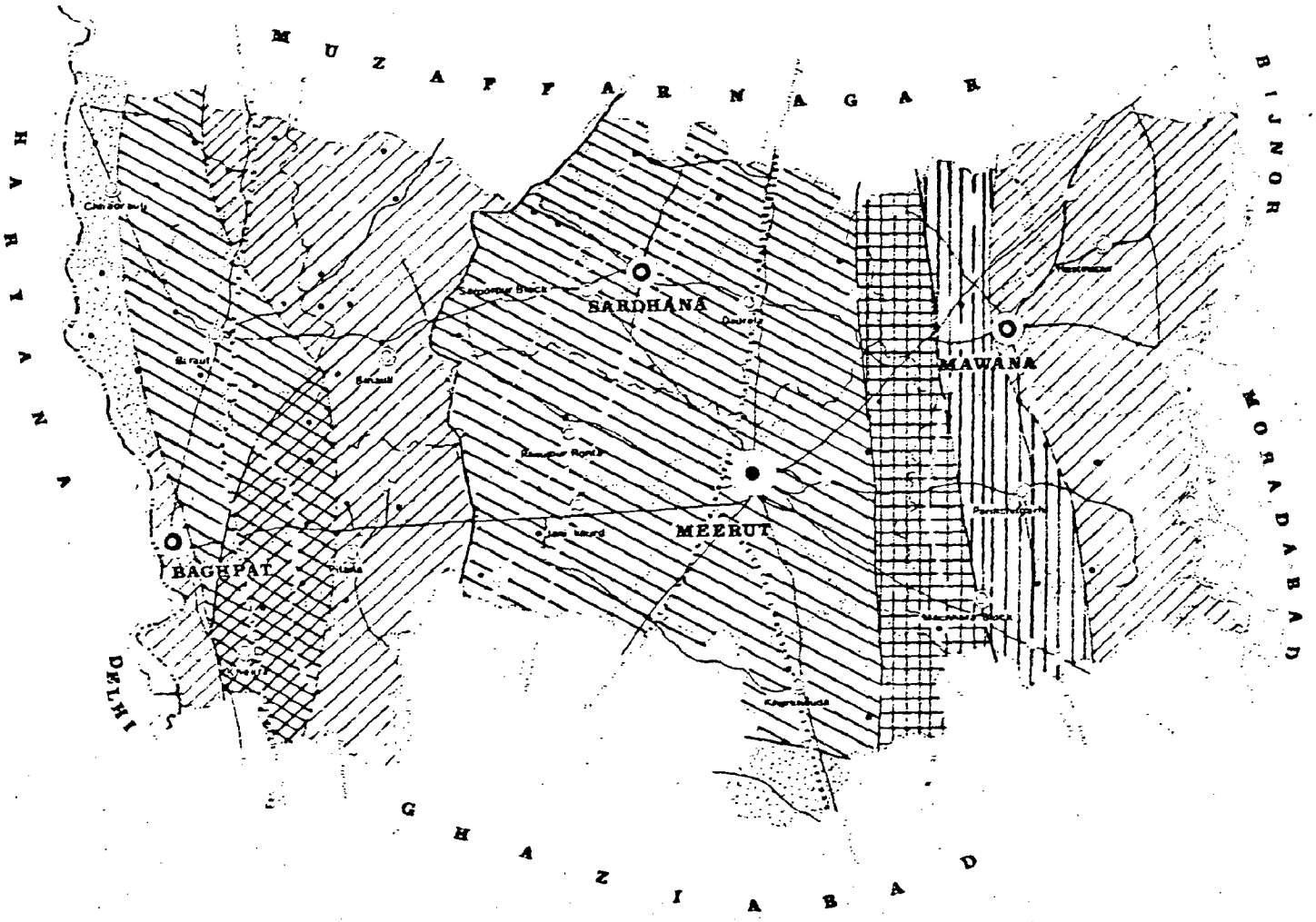
1. Fertility of soil and good irrigation.
2. Shift from cereals to sugar cane resulting in the development of agro-based industries.
3. Marketing facilities of agriculture produce like Delhi; and
4. Availability of infrastructure.

With the helping factors and forces; there are some forces which are coming in the way of development of this sector. These are :

1. Decreasing trend of soil fertility.
2. Mismanagement of canal water distribution.
3. Distribution of seeds is not at proper time with adequate quantity.

Overall it can be said that the development of agriculture is slow, and land potentials have to be used fully, and lastly irrigation has to be taken care of.

On the basis of above study following proposals can be made for dynamic growth of this sector :



LEGEND

BOUNDARIES STATE, DIST
BOUNDARIES TEHSIL, TIMASHAND
IMPORTANT METALLED ROADS
R.L.E. LINE WITH STNS - B.G.
RIVER AND STREAM, SEASONAL
HEADQUARTERS DIST, TEHSIL, VIKASKHAND
URBAN CENTRE
VILLAGE HAVING POP 5000 & ABOVE
PURE SAND
DHAKAR - CLAYEY SOIL
KHADAR - CLAYEY SOIL
SANDY LOAM
DOMAT - LOAMY SOIL
KHADAR - STIFF CLAY

OBSERVATIONS

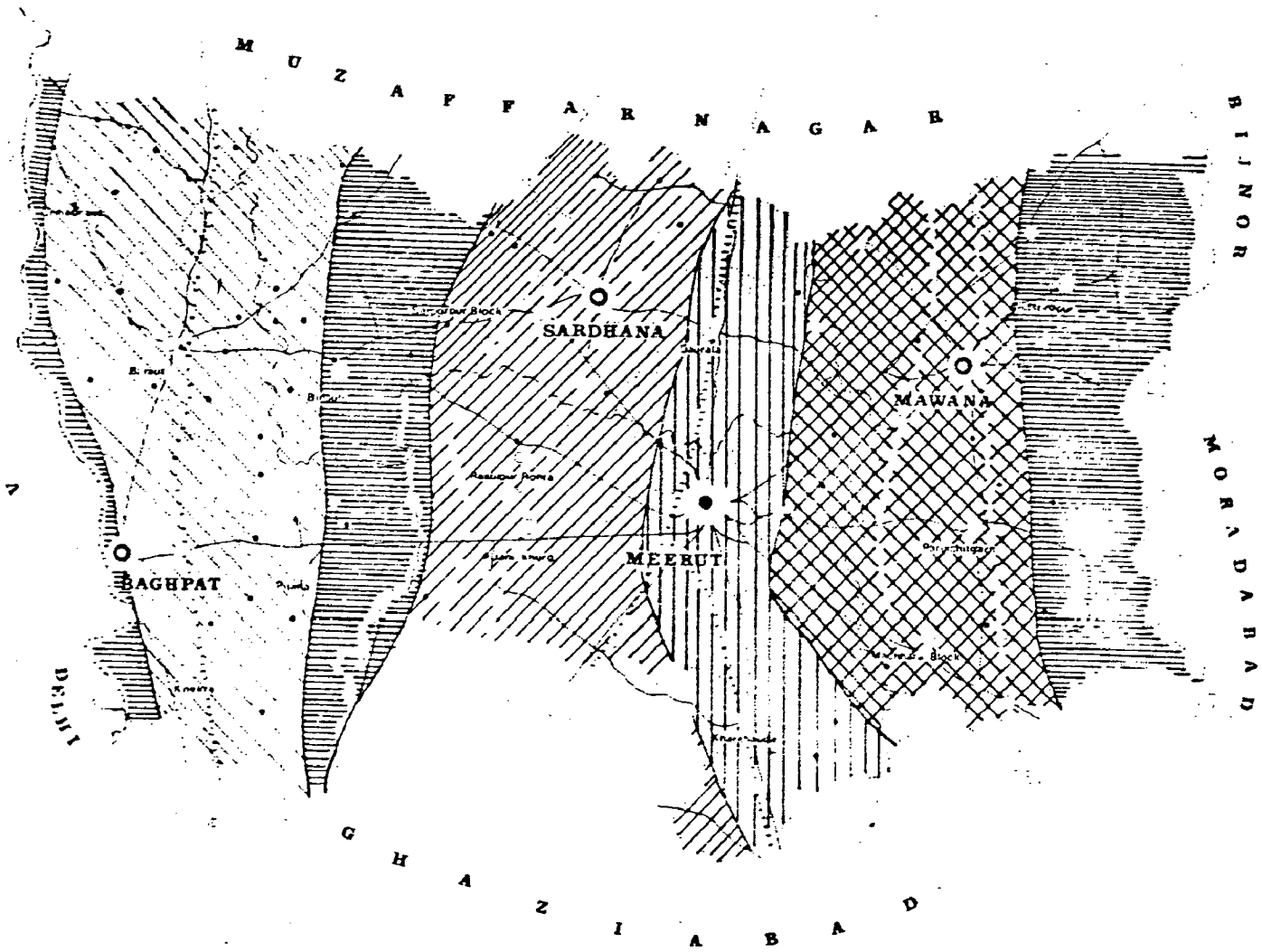
- [illegible] a portion in the state of the [illegible] not in agreement for wheat, mustard and millets
- [illegible] 36% of area used. This can be good resource for the cultivation [illegible] proposed to promote the already available in the district
- [illegible] in the [illegible] and very strong [illegible] there is [illegible] and [illegible] of [illegible] areas in [illegible]
- [illegible] sandy soil (5-7%), [illegible] (1%) [illegible] and [illegible] or heavy soil (11%) and [illegible] soil [illegible]

AGRICULTURE
SOIL TYPES

Narendra Singh
MURP II (1990–91)
U O R
ROORKEE

GROWTH DYNAMICS OF MEERUT DISTRICT

[illegible]



LEGEND

BOUNDARIES STATE, DIST.
BOUNDARIES TEHSIL, VIKASKHAND
IMPORTANT METALLED ROADS
RLY. LINE WITH STNS
RIVER AND STREAM, CANALS
HEADQUARTERS DIST, TEHSIL, VIKASKHAND
URBAN CENTRE
VILLAGE HAVING POP 5000 & ABOVE
AREA IRRIGATED BY YAMUNA CANAL
AREA IRRIGATED BY UPPER GANGA CANAL
AREA IRRIGATED BY GANGA CANAL
AREA IRRIGATED BY LIBALI
UNIRRIGATED AREA

OBSERVATIONS

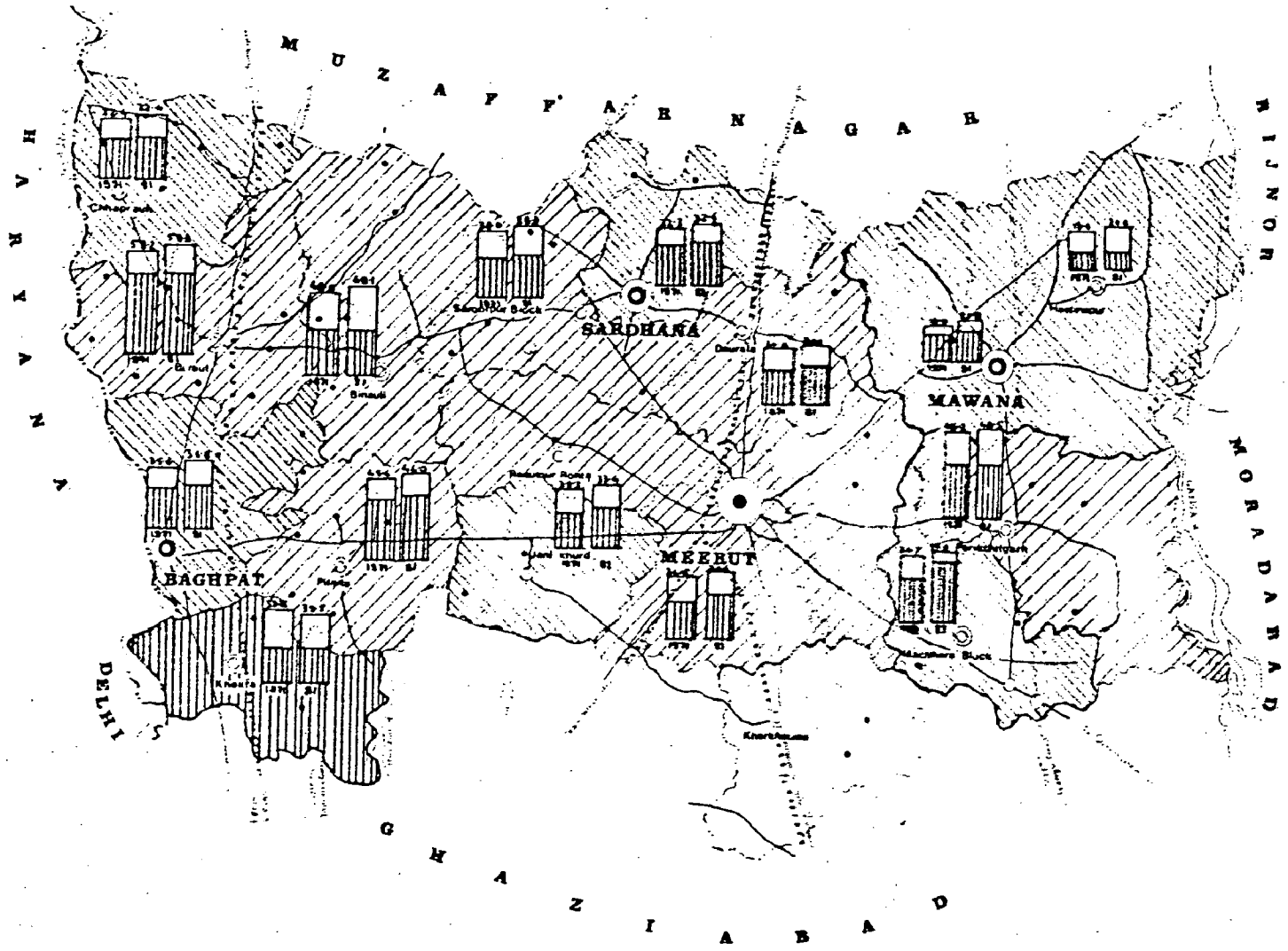
- MOST OF THE AREA IS WELL WATER BY CANALS
- IN THE CENTRE ZONE PREDOMINANTLY TUBEWELLS ARE THE MAIN SOURCES FOR IRRIGATION (70% AREA)
- 75% OF THE TOTAL AREA (CULTIVATED IS) IRRIGATED BY DIFFERENT SOURCES

AGRICULTURE
IRRIGATION TYPES

GROWTH DYNAMICS OF MEERUT DISTRICT

[MAP NO. 97

Narendra Singh
MURP II (1990-91)
U O R
ROORKEE



LEGEND

BOUNDARIES STATE, DIST
BOUNDARIES TEHSIL, TARASHAND
IMPORTANT METALLED ROADS
RLY. LINE WITH STNS - B.G.
RIVER AND STREAM, CANALS
HEADQUARTERS - DIST., TEHSIL, TARASHAHAR
URBAN CENTRE
VILLAGE HAVING POP. 5000 & ABOVE
IRRIGATED AREA
UNIRRIGATED AREA
15,000 ACRES AND ABOVE
6,000 ACRES TO 10,000 ACRES
LESS THAN 6,000 ACRES

OBSERVATIONS

- 32% of cultivated area is unirrigated.
- There is a [illegible] between cultivated and irrigated area during 61 to 71, area available for irrigation is more than [illegible] in spite of the canals, running and being [illegible]

AGRICULTURE

CULTIVATED & IRRIGATED AREA

1971-81

GROWTH DYNAMICS OF MEERUT DISTRICT

[MAP No. 10]

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MURP II (1990-91)
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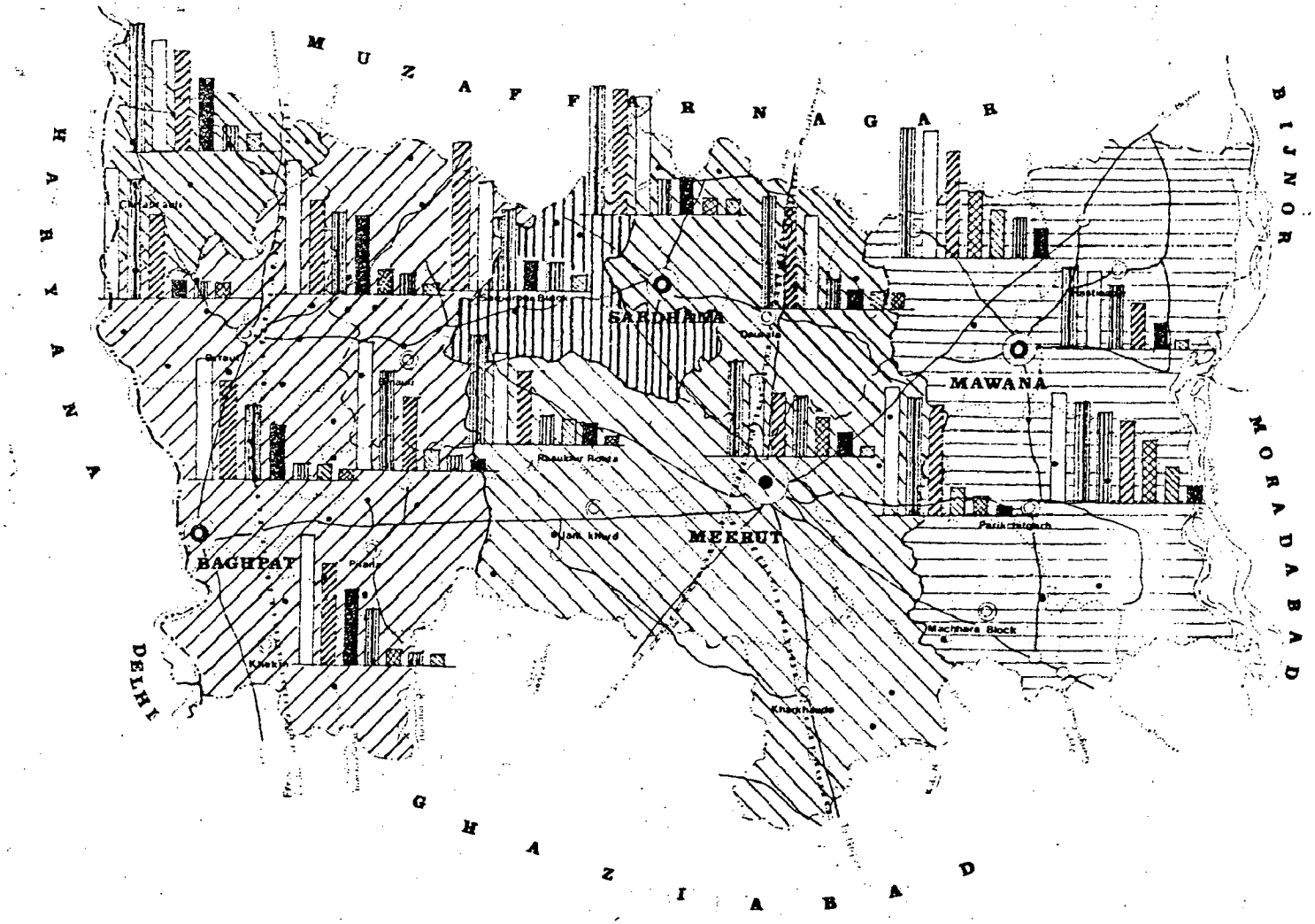


LEGEND

BOUNDARIES STATE, DIST. _____

BOUNDARIES TEHSIL, VIKASKHAND _____

IMPORTANT METALLED ROADS _____

RLY. LINE WITH STNS - B.G. _____

RIVER AND STREAM, CANAL _____

HEADQUARTERS - DIST., TEHSIL, VIKASKHAND ◎ ◎ ◎

URBAN CENTRE _____ ○

VILLAGE HAVING POP. 5000 & ABOVE _____ •

AREAS WITH PREDOMINANTLY

WHEAT _____

SUGARCANE (perennial crop) _____

GRAM, PEAS, PULSES & OILS (Rabi & mixed crops) _____

MIXED CROPS (Kharif & mixed crops) _____

ACREAGE UNDER

SUGAR _____

WHEAT _____

GRAM PEAS PULSES AND OIL _____

JOWAR & BAJRA _____

RICE _____

COTTON _____

BARLEY _____

• wheat, sugarcane and gram peas pulses and the dominating crops in the division

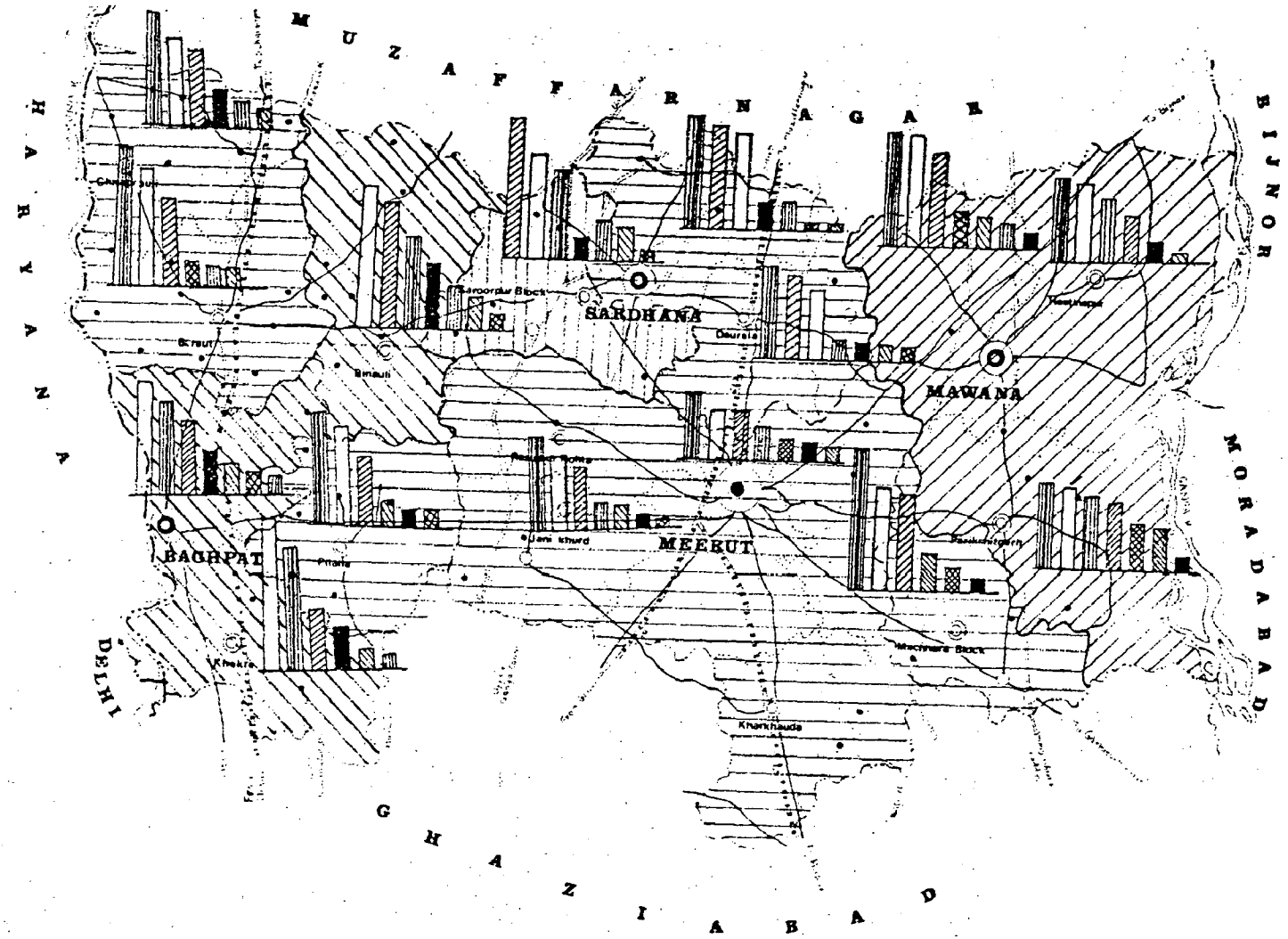
• acreage under sugarcane is highest in the division then followed by wheat in sugarcane mixed crops in the west

AGRICULTURE
CROPPING PATTERN

Narendra Singh
MURP II (1990-91)
U O R
ROORKEE

GROWTH DYNAMICS OF MEERUT DISTRICT

[MAP NO. 1]



LEGEND:

BOUNDARIES STATE, DIST
BOUNDARIES- TEHSIL, VIKASKHAND
IMPORTANT METALLED ROADS
RLY. LINE WITH STNS - B.G.
RIVER AND STREAM, CANALS
HEADQUARTERS - DIST, TEHSIL, VIKASKHAND
URBAN CENTRE
VILLAGE HAVING POP 5000 & ABOVE
AREAS WITH PREDOMINANTLY
WHEAT
SUGARCANE (FOLDING CANE)
GRAM, PEAS, PULSES AND ...
MIXED CROPS
ACREAGE UNDER
SUGARCANE
WHEAT
GRAM, PEAS, PULSES AND DAL
JOWAR & BAJRA
RICE
COTTON
BARLEY

- There is a shift from cereal & oil crops during 1961 to 1981 the Hapur block went under mixed crops and Khadi dominating area and now under sugarcane cultivation
- Main crops of the district are wheat, cereals, pulses & sugarcane

AGRICULTURE
CHANGE IN CROPPING PATTERN
1981

GROWTH DYNAMICS OF MEERUT DISTRICT

[MAP NO-12]

Narendra Singh
MURP II (1990-91)
U O R
ROORKEE

1. There is a need to protect the net area sown by adopting suitable land use control policy.
2. Similar treatment has to be given for increasing the double cropped area.
3. Underground water survey and water testing should be undertaken for suggesting better irrigation.
4. Rotation of crops from creals to cash crops has to be encoveraged.

3.4 GROWTH DYNAMICS OF INDUSTRIES :

The district urban centres are registering fast development of medium and large scale industries. Most of the industries which have developed are market oriented rather than export based. The demand for their products is largely boosted up by the unprofitable cost distance relationship of other markets in the country with Delhi and also due to the functioning of Delhi as a wholesale centre for entire North-West India. Among the important industries in the district are textiles , general machinery, paper and printing, metal products and electrical machinery. The deficiency of local resources ~~of local resources~~ in the district has resulted in setting up important based industries based on imported materials rather than resource-based industries. The faster growth of industries is aided by the availability of skilled manpower in the district.

Manufacturing industries ingeneral are of considerable importance in the local economic growth and provide the key to the future growth and welfare of this district. The vast possibility

of agricultural improvement and the present efforts to achieve self-sustainence in agricultural field would have a deep impact on related agro-based industries both as a booster for employment potentials as well as to provide a fill up to the growth of manufacturing industries. Workers in household industry were 13.10% while in manufacturing there were only 5.45% to total working force.

Agro-based Industries :

Important agro based industries of the district are sugar, agricultural implements and oil industries. Meerut district has the largest number of sugar factores and also a large concentration of oil mills as compared to westernU.P. the district is the home of sugar.

At district level total employment has been increased upto 24.6 thousand in 1988 and while it was only 5.5 thousand in 1962.

Highest concentration of industries is in Meerut (400) Meerut industrial complex is specialised in metal products (90), machines (66), wood products (60), leather and animal products, printing and publishing and food products.

After decribing the general distribution with types of the industries and employment, it becomes necessary to identify the factors and forces which are helping in the positive development as given below :

1. Different types of industries are attracting people from other centres.
2. Intra and inter-regional linkages by roads and rails.

3. Inward flow of raw materials.
4. Availability of good infra-structure.

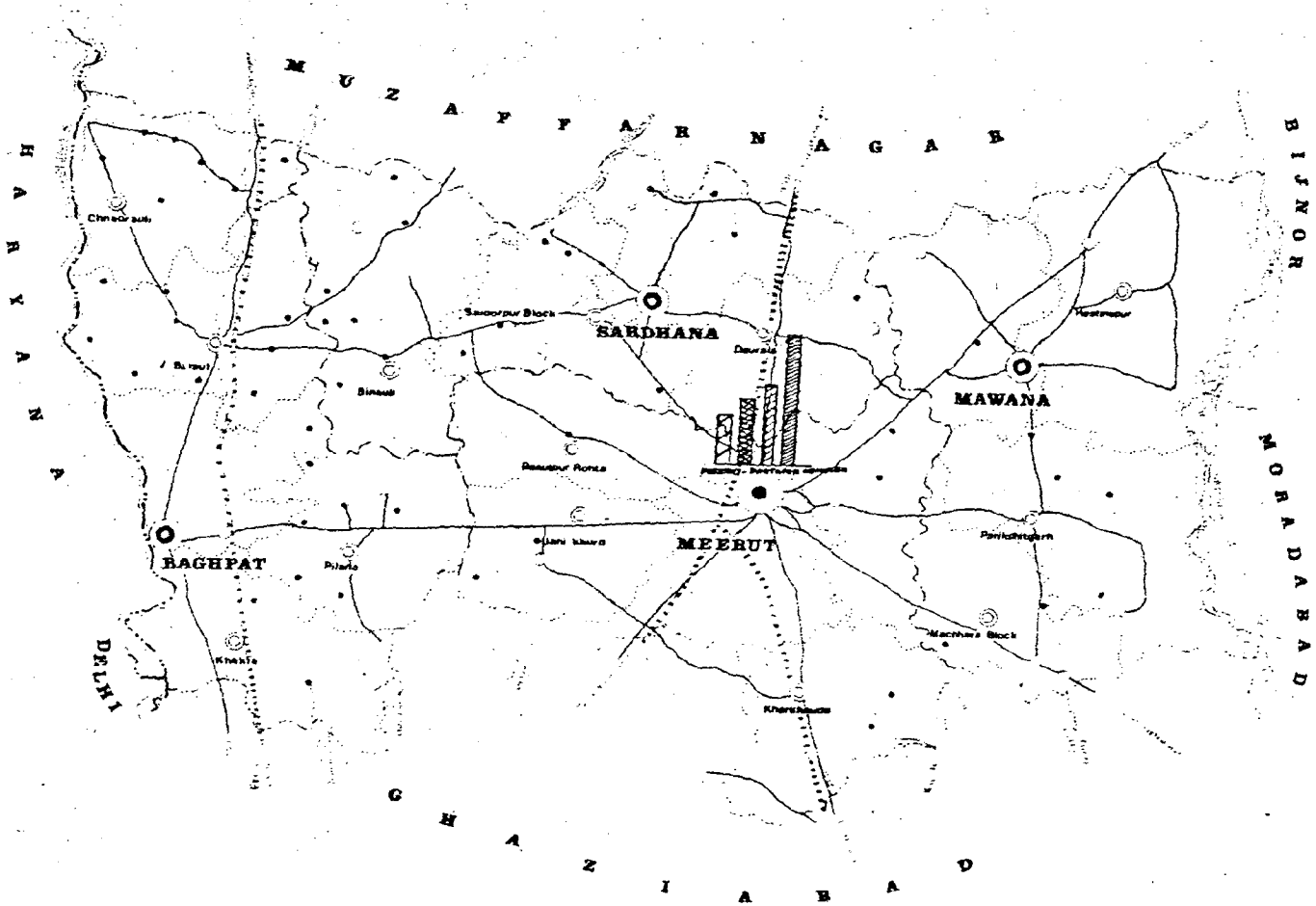
The main obstacles in industrial development is scarcity of minerals in the district. All manufacturing industries are based on imports.

On the basis of above description it can be said that existing industries can be divided into following categores:

1. Industries directly contributing to agricultural development like fertilizer,tractors, agricultural machinary, irrigation.pumps pipes, road building machinary etc.
2. Agro-based industries deriving their raw materials from agricultural produce viz. sugar, paper pulp (from bagare) formentation, oil drugs etc.
3. Forest based industries viz. paper and pulp, paper board, plywood, tarptentile etc.
4. Ceramic industries such as cement and brick kilns; and
5. Industries manufacutting consumer machanical and electrical goods based on the consumption of electric power.

Last two categories assisting agricultural operations and produce can be advantageoubly developed in the growth centres.

For the dynamic growth of this aector increases in raw materials with some specific policy is necessary.



BOUNDARIES- STATE, DIST.
BOUNDARIES- TEHSIL, VIKASKHAND
IMPORTANT METALLED ROADS
RLY. LINE WITH STNS - B.G.
RIVER AND STREAM, CANAL
HEADQUARTERS- DIST, TEHSIL, VIKASKHAND
URBAN CENTRE
VILLAGE HAVING POP 5000 & ABOVE

INDUSTRIAL EMPLOYMENT

OBSERVATION

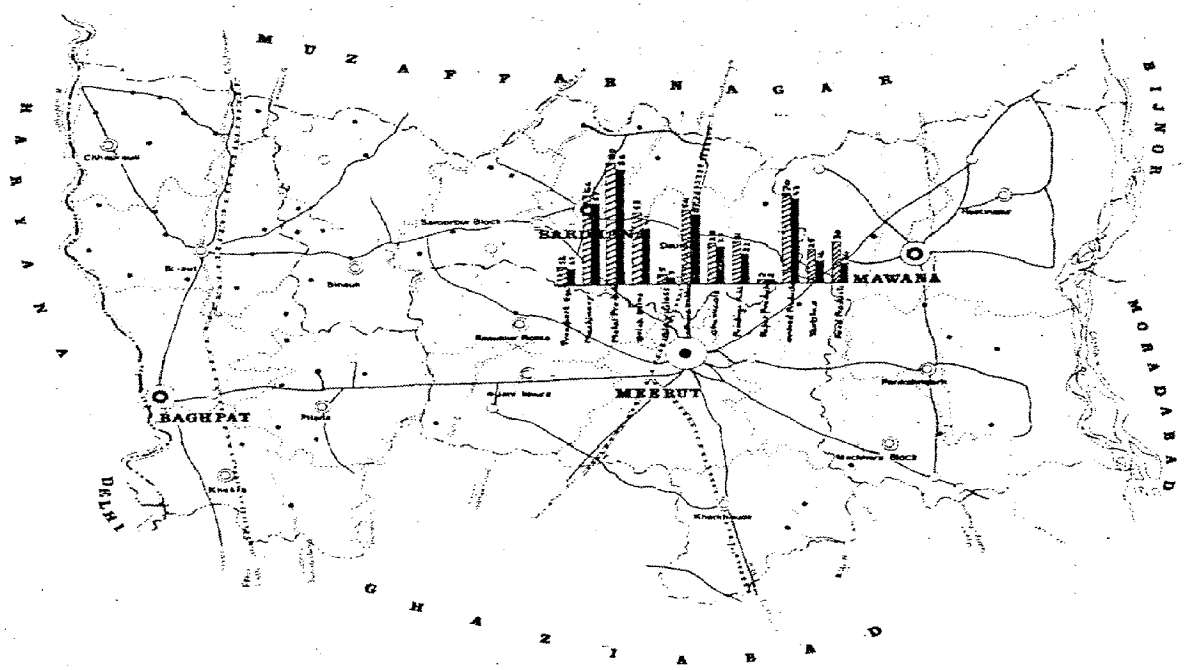
INDUSTRIES

GROWTH OF WORKERS 1951-1981

GROWTH DYNAMICS OF MEERUT DISTRICT

[MAP NO 13]

Narendra Singh
MURP II (1990-91)
U O R
ROORKEE



GROWTH DYNAMICS OF MEERUT DISTRICT

[MAP NO. 14]

INDUSTRIES

LEGEND

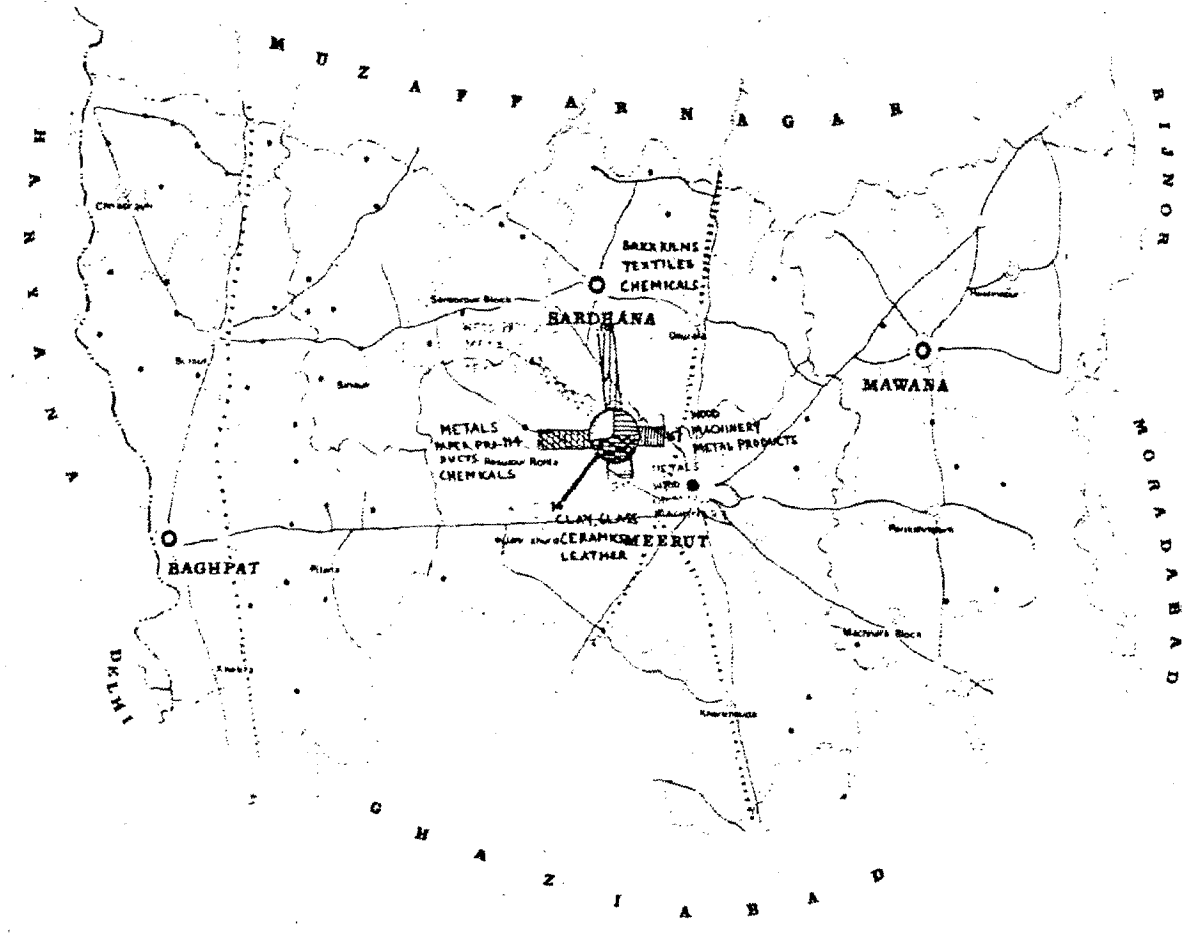
BOUNDARIES- STATE, DIST.
BOUNDARIES- TEHSIL, VIKASKHAND
IMPORTANT METALLED ROADS
RLY. LINE WITH STNS.- B.G.
RIVER AND STREAM, CANALS
HEADQUARTERS- DIST.,TEHSIL, REMARKABLE
URBAN CENTRE
VILLAGE HAVING POP. 5000 & ABOVE
No. OF INDUSTRIES : 1971
1962

OBSERVATIONS

- Major industries, machinery, metal products, truck, tyre, and textiles.
- Number of industries located in meerut are very high, consisting of metal products (26), machinery (46), cement industry (24), textiles & rubber industries (27) & other industry

GROWTH & TYPE OF INDUSTRIES 1962 to 1972

Narendra Singh
MURP II (1990-91)
U O R
ROORKEE



BOUNDARIES- STATE, DIST .....
BOUNDARIES- TEHSIL, NYAYSANHD .....
IMPORTANT METALLED ROADS .....
RLY. LINE WITH STNS - B.G. .....
RIVER AND STREAM, CANALS .....
HEADQUARTERS - DIST, TEHSIL, NYAYSANHD
URBAN CENTRE .....
VILLAGE HAVING POP 5000 & ABOVE ...

MODE OF TRANSPORT

BY RAIL
BY TRUCKS
BY OTHER MEANS

SOURCE OF RAW MATERIALS FOR NO. OF INDUSTRIAL UNITS

LOCAL
DELHI
UTTAR PRADESH
PUNJAB & HARYANA
RAJASTHAN
OTHERS

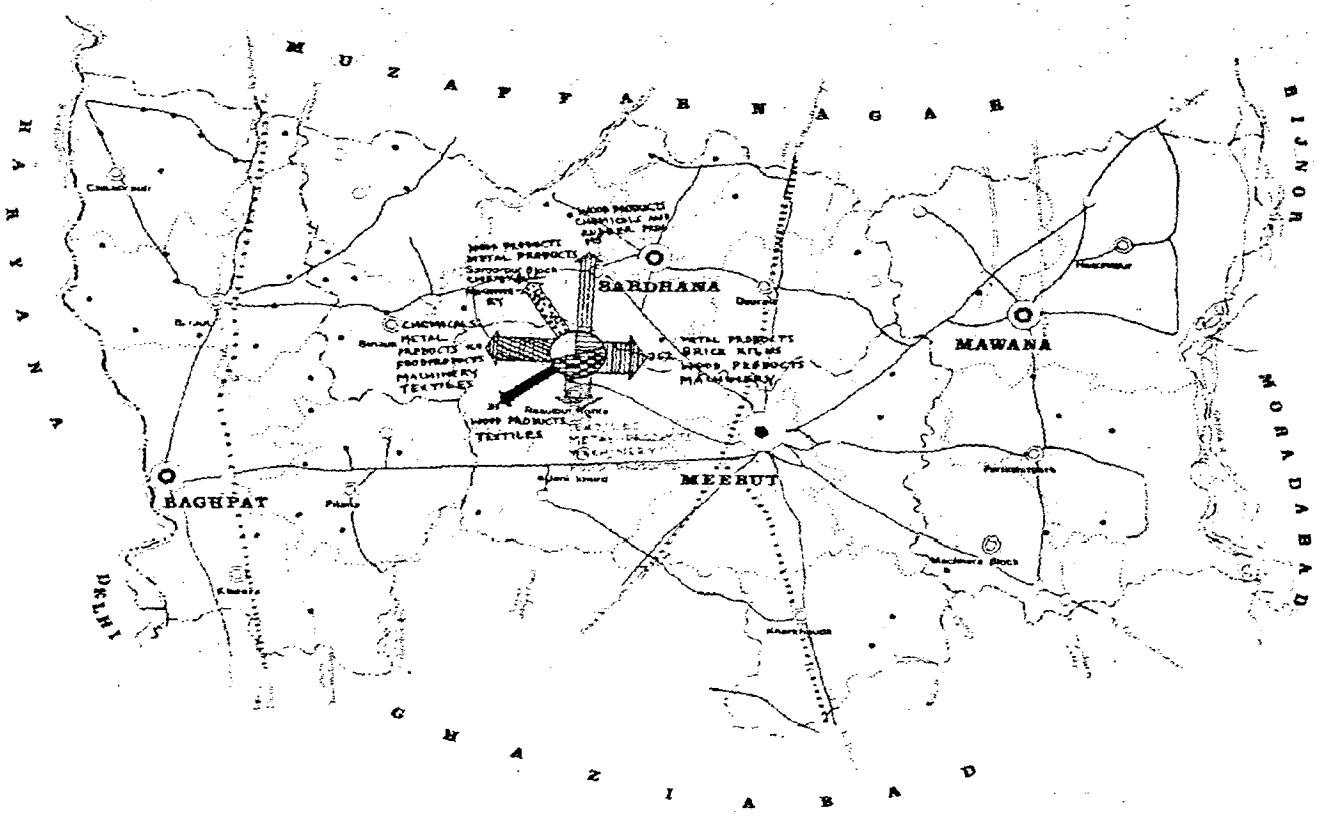
* RAW MATERIALS IN ALMOST ALL THE INDUSTRIAL CONCENTRATIONS ARE DRAWN MOSTLY FROM THE DISTRICT AND ADJOINING DISTRICTS
* AS AGRO AND FOREST BASED INDUSTRIES THE DISTRICT ITSELF IS THE CREDITED SUPPLIER
* POPULAR MODE OF TRANSPORT FOR THE RAW MATERIAL IS BY ROAD.

INDUSTRIES
IMPORTS OF RAW MATERIALS

GROWTH DYNAMICS OF MEERUT DISTRICT

[MAP NO·15]

Narendra Singh
MURP II (1990-91)
U O R
ROORKEE



BOUNDARIES STATE DIST. . . . .
BOUNDARIES TEHSIL, NYAYPANCHAYAT . . . . .
IMPORTANT METALLED ROADS . . . . .
R.L.Y. LINE WITH STNS - B.G. . . . . .
RIVER AND STREAM, CANALS . . . . .
HEADQUARTERS - DIST., TEHSIL, NYAYPANCHAYAT
URBAN CENTRE . . . . .
VILLAGE HAVING POP. 5000 & ABOVE
MODE OF TRANSPORT
BY RAIL
BY TRUCKS
BY OTHER MEANS

CONSUMING CENTRES, POP.
INDUSTRIAL UNITS
LOCAL
DELHI
UTTAR PRADESH
HARYANA
RAJASTHAN
OTHERS

OBSERVATION

- EXPORTS ARE HIGHER THAN THE IMPORTS IN THE DISTRICT, RESULTING IN THE DYNAMIC BALANCE.
- MAIN FINISHED PRODUCTS ARE MACHINERY, METAL PRODUCTS, LEATHER AND RUBBER PRODUCTS AND BRICKS AND TERRACES.
- AFTER MEETING THE STATE DEMAND, DELHI IS THE LARGEST IMPORTER OF FOOD PRODUCTS, TEXTILES, MACHINERY, METAL PRODUCTS AND BRICKS FROM PRESENT DISTRICT.
- OTHER IMPORTANT CONSUMING CENTRES ARE RAJASTHAN, HARYANA & PUNJAB WHILE STATE ITSELF IS A LARGEST CONSUMER OF ITS PRODUCTS.

INDUSTRIES
EXPORT OF INDUSTRIAL PRODUCTS

GROWTH DYNAMICS OF MEERUT DISTRICT

[MAP NO. 16]

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U O R
ROORKEE

3.5 GROWTH DYNAMICS OF TRADE AND COMMERCE :

Trade and commerce plays an important role in the field of economic activity in the district. According to the 1981 census the percentage of working force engaged in this sector both in rural and urban areas was much higher than the figures for U.P. State and India. The district has a number of well developed commercial mandies for wholesale and retail trades. This shows that the district has a predominantly developed commercial economy.

The district is almost wholly agricultural in character. As such trade and commerce mainly in wholesale goods is an important economic function of the district, and its development is essential to encourage regional production economic like agriculture and industry. The chief export materials are grain and cotton. Most of the wholesale as well as retail trade is concentrated in towns located on the major road and railway network. Raw cotton, oil seeds, fruits, vegetables oil and finished industrial products are exported to Delhi and to other parts of the country.

Wholesale trade in foodgrains in the oldest in the district. This trade is mainly concentrated in Meerut. Meerut is the main centres for the distribution of handloom cloth.

Total number of units and employment considering the foodgrains, Baraut is the biggest centre of trade in the district. In that order, rank about equal to each other after Baraut. Ther are trading 82 units in Baraut and 51 in Meerut. It

accounts for 2 and 5 wholesale unis against 51 of foodgrains and 58 of vegetables and fruits and also provides the larges employment.

The main helping growth elements in this sector are closeness of important trade certre from the main roads, and railways network and availability of other infrastructure.

The obstacles are congestion, inadequate transport facilities, space for storage and parking.

Possible proposals are :

a. To provide the accessibility by rial and road.

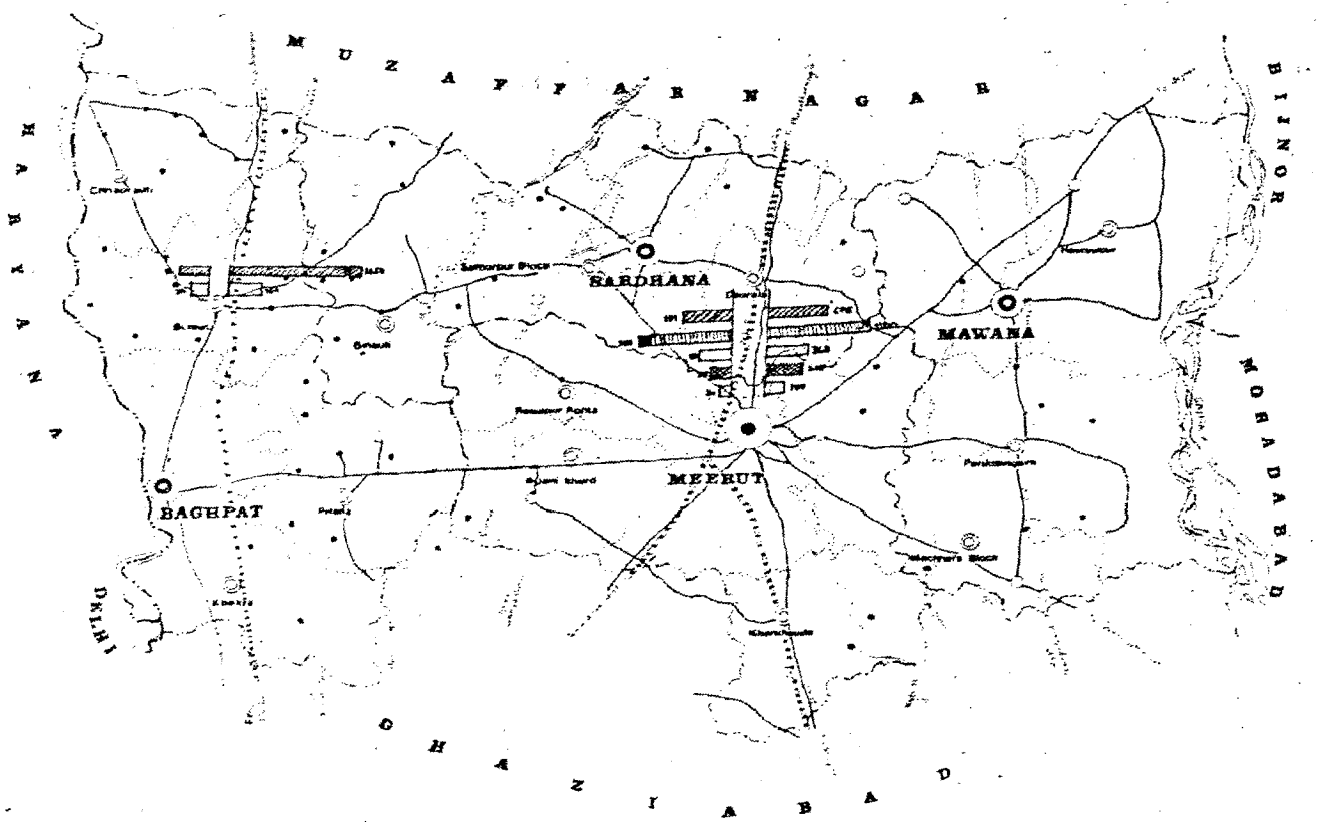
b. Railway siding and goods sheds.

c. Truck facilities.

d. Adequate space for wholesale markets.

e. Telephone facilities.

These improvements will help in the development of trade and commerce.



BOUNDARIES- STATE, DIST ....
BOUNDARIES TEHSIL, HEADQUARTERS ....
IMPORTANT METALLED ROADS ....
RLY. LINE WITH STNS.- B.G. ....
RIVER AND STREAM, CANALS ....
HEADQUARTERS- DIST.TEHSIL, VILLAGE AND ....
URBAN CENTRE ....
VILLAGE HAVING POP 5000 & ABOVE ....

FOOD GRAINS
CLOTHS (HANDLOOM MILLS)
TIMBER
FRUITS AND VEGETABLES
HARDWARE
OTHERS

- BARAUT is the main foodgrain market in the district having 10th rank in 1981.
- MEERUT is the main wholesale trade centre in district having 51st rank.
- OTHER important trade in fruits and vegetables, timber and handicrafts.

TRADE AND COMMERCE
FLOWS & EMPLOYMENT OF WHOLESALE TRADE IN SELECTED TOWNS

Narendra Singh
M.U.R.P II (1990—91)
U O R
ROORKEE

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GROWTH DYNAMICS OF MEERUT DISTRICT

[MAP No.17]

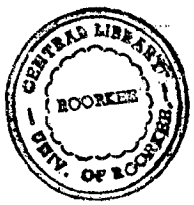
3.6 GROWTH DYNAMICS OF TRANSPORT AND COMMUNICATION:

Thansport and communication is the backbone of a region as the inter-dependence of producers and consumers may accelerate ar deaccelerate the growth depending on the efficiency of the network of rail and road transport which directly define the mobility of goods and passengers within the specific area. Air-services are absent in Meerut District and it is dependent on rail and road transport.

Meerut district is very efficiently connected to major transport routes and to the rest of India. The convergence of State Highways and other important rail and road connections within the district has resulted in increasing the intra-regional and inter-regional flow of goods and people.

It is one of the obective in developing the priority centres of regional plan that the distance of Delhi from other urban centres and the distance among different growth centres should be minimized by developing rail and road transport so that movement should be completed with in the less time from one place to the other.

3.6.1 PRESENT TRANSPORTATION NETWORK :



3.6.1.1 RAIL FACILITIES :

The whole district comes under the region of Northern Railway. There are only broad gange lines. The Important railway lines of this sub-region are :

1. Ghaziabad-Meerut Daurala : This line goes upto Punjab and Kashmir.
2. Meerut-Bulandshahar-Hapur.

Transportation pressure is more on Ghaziabad-Meerut line. There is more crowd in the office time i.e. in morning and evening and this line is not fulfilling the requirements of commuters.

3.6.1.2 ROAD TRANSPORT :

Thereare 9 major corridor in N.C.R. in which 2 are in District Meerut :

1. Delhi - Ghaziabad - Meerut
2. Delhi - Loni - Baghpat - Baraut.

Th state highways passed through the district :

1. Sh - 18 Meerut-Hapur-Bulandshahar
2. SH - 45 Ghaziabad-Meerut-Daurala
3. SH - 57 Loni-Baghpat-Baraut.

In district Meerut 1774 Kms are metalled roads out of which 1306 Kms are under Public Works Department.

3.6.2 PROBABLE TRANSPORTATION - 2001 :

Seeing the probable development process and growth it is necessary to develop a coordinated multimodel system of transportation sothat a blanced and planned economic development can be achieved, which can fulfil the main objects of the development of Delhi.

3.6.2.1 PROPOSALS FOR RAIL FACILITIES :

The whole district is under the influence of Delhi region and passengers and goods transport is more. Seeing the movement of goods and passengers in this region it is necessary the betterment in the rail system. For this there are following recommondations in

the regional plan :

1. To fulfill the extra requirement of passengers movement in the present rail facilites.
2. To lay out one more line between Murad Nagar and Meerut cantt and electrification of whole section.

3.6.2.2 PROPOSALS FOR ROAD TRANS PORTATION :

Following are the proposals out side Delhi region in regional plan :

1. Construction express ways on new pallel alignment
2. Development of Inner and Outer grids
3. Sub-regional road facilities.

3.6.2.2.1 EXPRESS WAYS :

After Delhi Meerut city is the larget in N.C.R. and a greater interaction is in between Meerut and Delhi. Meerut has been proposed to be developed as multipurpose primary development centre. Therefore it is estimated that there will be great increase in road transport in between Delhi-Meerut. The present width of road for movement is falling less between these cities due to a large constructed region in the present roads. For the achievement of the one object of regional plan that the time taken in the movement should be minimized, Express highways are proposed. The right of way of which will be 100 metres and initially express way will be divided in four lanes on which entrance should be restricted and also there must be grade seperater on all intersection. Out of 3 expressways proposed in regional plan-2001 one passes through Meerut district which is in between Delhi-Ghaziabad Meerut.

3.6.2.2.2 IMPROVEMENT OF STATE HIGHWAYS :

It is proposed to widen and strengthen the state highways upto - 2001. Initially in two lanes and finally four lanes of divided state highways.

3.6.2.2.3 SUB-REGIONAL ROAD FACILITIES :

Out of 26 Basic village 3 village are not linked by metalled roads. Because it is necessary to give the priority to rural development so it is proposed that these three villages Dhanaura silvar Nagar, Mawi Kalan and saranwan should be linked by metalled roads so that movement should be possible from these centres to the other in each season. By analysing the development in this region after 2001 to give the motion in transportation facilities and for further development it is proposed that the centres of the same rank should be linked directly and the centres of lower rank based on these centres should be connected by direct link roads.

It has been seen that all sub-regional centres and service centres proposed in settlement pattern are on the major district roads.

MOVEMENT OF GOODS AND PASSENGERS :

Inward flow of goods is maximum in Meerut which is biggest urban centre and consuming market. Baghpat is also an important centre of goods movements and is both a consumption and supply centre.

To conclude, the following are the helpful elements :

1. Well connected with on distance rail and road routes to the other growth points in the country.
2. Is the important railway junctions; and
3. Attraction to workers in this sector.

Main obstructing elements are congestion on roads in cities and increase in prices of petrol.

The main conclusions are convergence of state highways and other important roads and raib connection within the region has resulted in increasing the inter - regional and intra - district flow of goods and people.

3.7 OTHER INTRA - STRUCTURE :

The total environment of a place greatly depends on the availability of a land and accessibility to essential amenities and services in the area. The important infrastructure other than already described are as under :

3.7.1 DISTRICT WATER SUPPLY :

This can be studied under tow heads namely :

a) Water for irrigation ; and

b) Drinking water supply.

Drinking Water Supply :

Drinking water supply in the district is mainly from Upper Ganga canal and sub-soil water which includes tubewells and handpumps. The important towns of the district mainly depend on sub-soil water. The main source of drinking water supply in these are tubewells and handpumps. Even in the industrial towns consumers get very little water from public water supply system as most of the industrial units maintain private tubewells water storage tanks.

Water for irrigation has already been discussed in Chapter 2.

3.7.2 Drainage and Flood Control :

Ganga and Yamuna are the main drainage channels in the district. The direction of flow is from north to south. There are a number of tributaries, like Hindon and kali Nadi. A number of smaller channels and nalas exist in the district.

The major flood affected areas in the district are generally confined to areas along the banks of the rivers particularly the Yamuna, the Ganga and Kali, where floods take place due to overflow from these rivers during rainy season. Inorder to have flood control in the district, it is necessary to effect improvements in the existing drainage system.

3.7.3 District Power Supply :

In these days development of power resources is of prime importance for the development of the district. Agriculture and

industry are dependent on reasonably priced and reliable supply of power, Similarly, power is essential for operation of tubewells and water pumps for irrigation.

The district is very rich in hydro-power resources. Uttar Pradesh has three district zones of power supply viz Ganga grid, Sand and Rihand grid. The Ganga grid serve the district. Hydro-electric schemes on Ganga canal were started in 1930. This is the biggest scheme in India for utilizing low head falls. In the first phase of development (1928-35) one independent schemes mainly Bhola (2,700 Kw) in the district was started in the second phase of its development (1935-1939) Salawa (3,000 Km) hydro power station was developed in the district. The main aim of these power stations was to supply power to rural areas and small towns for domestic and minor industrial purposes. There are 49 sub-power stations other than abovementioned.

Industrial consumption of electricity comprised 70.5% of the total consumption of electricity followed by 23.5% in irrigation.

3.7.4 Recreational Facilities :

Among the numerous weekly markets and fairs the summer and winter bathing festivals on the Ganga river is attracting about one million bathers and the Nauchandi fair is also very famous.

3.7.5 Educational Facilities :

As it is already mentioned about literacy level in rural and urban areas which is high as compared to U.P. This is because of

higher educational institutions in the rural areas of the district. The location of degree and post-graduate educational institutions are shown in the map for major urban centres (Table No.)

3.7.6 Health Facilities :

Health facilities are available within the radium of 8 km in the district. At present 51 hospitals and dispensaries, 11 maternity and child welfare centres and 8 family planning centres are available. Total number of units per 100 sq. km becomes 1.2 in 1967.

CHAPTER-4

ELEMENTS OF GROWTH DYNAMICS : INTERACTIONS AND INTERDEPENDENCY :

Different elements of growth dynamics have been discussed already in Chapters 2 and 3. It was possible from their interaction and trends to understand the growth process in the district, and now it is necessary to identify the factors, their interactions and interdependence.

In agriculture main elements studied are climate, soils, topography, land utilisation, irrigation types, cultivable area, irrigated area and shift in cropping pattern.

It is observed that cropping pattern is shifting from cereals to cash crops. This is a result of interactions between irrigated area and type of crops which is guided by helpful nature to the farmers.

Interaction of human resource and natural resource is helping in the dynamic growth of this district.

In industrial sector, growth of industries, types of industries, employment pattern, elements are studied. These elements are highly interacting with local raw material and number of industrial units. And the growth of this sector is mostly dependent on inter and intra road and railway linkage, which is highly contributing elements, not only this but it is attracting new type of industrial units. Now on the basic of this it can be said that there is a very high interdependency between linkages, location of industries and flow of inward and outward of finished products.

Growth of trade and commerce is a result of well being of other sectors like agriculture and industry. In the district both mentioned sectors are growing, i.e. is resulting in this sector. Now it can be said that dynamic growth of this region depends on other sectors of economy.

Similarly transportation and communication itself cannot lead to growth, but if it is available it can help in the interaction of other elements like industries and location of markets etc.

If growth is there in above mentioned sector it attracts people and concentration process in urban areas starts. Similar growth process can be observed in the district.

On the basis of interaction and interdependency elements, following heirarchy of intensity of interaction has been drawn with the help of 'nxn' matrix.

1) Very High Interaction: Population growth, migration and movement of passengers.

2) High Interaction: Working force, accessibility, specialised industries, urban literacy, growth of industrial workers, shift in cropping pattern, inward flow of raw materials, movements of goods specialised trade, export of finished products.

3) Low Interaction: Cultivable area, soil fertility and workers in trade and commerce.

4) Very Low Interaction: Sex ratio, irrigation by types, female literacy and rural literacy.

CHAPTER-5:

CRITICAL GROWTH DYNAMICS IN MEERUT DISTRICT :

On the basis of the above studies i.e. growth process, elements, their interactions, interdependency and their spatial distribution, critical growth dynamics can be identified. Broadly these can be divided into two parts, as given below :-

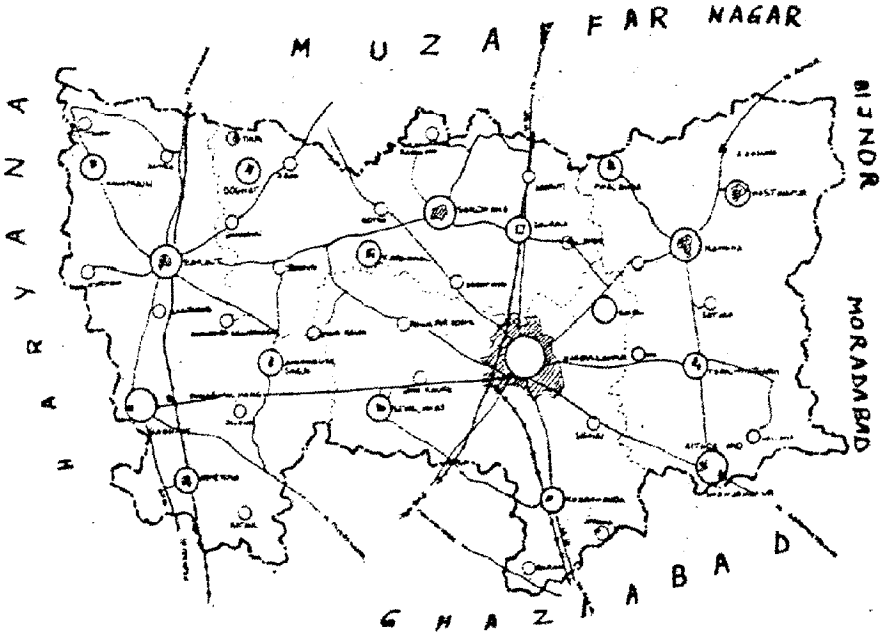
(A) Helpful Elements in Growth Dynamics

1) Working force
2) Flow of goods and passengers on roads and rails.
3) Shift in cropping pattern (from cereals to cash crop sugar cane).
4) Specialised trade and industries attracting people from within and outside the district.
5) Urban literacy change.

(B) Obstructing Elements in Growth Dynamics

1) Maintenance of land fertility.
2) Mismanagement of irrigation.
3) Sex ratio in rural areas.
4) Distance and time factor between rural and urban areas.
5) Small holding.
6) Slow acceptance of H.Y.V.
7) Non-availability of minerals in the district.
8) Lack of infrastructure like godowns etc.
9) Dependency ratio is high.

PROPOSED SETTLEMENT SYSTEM - 2001



LEGEND

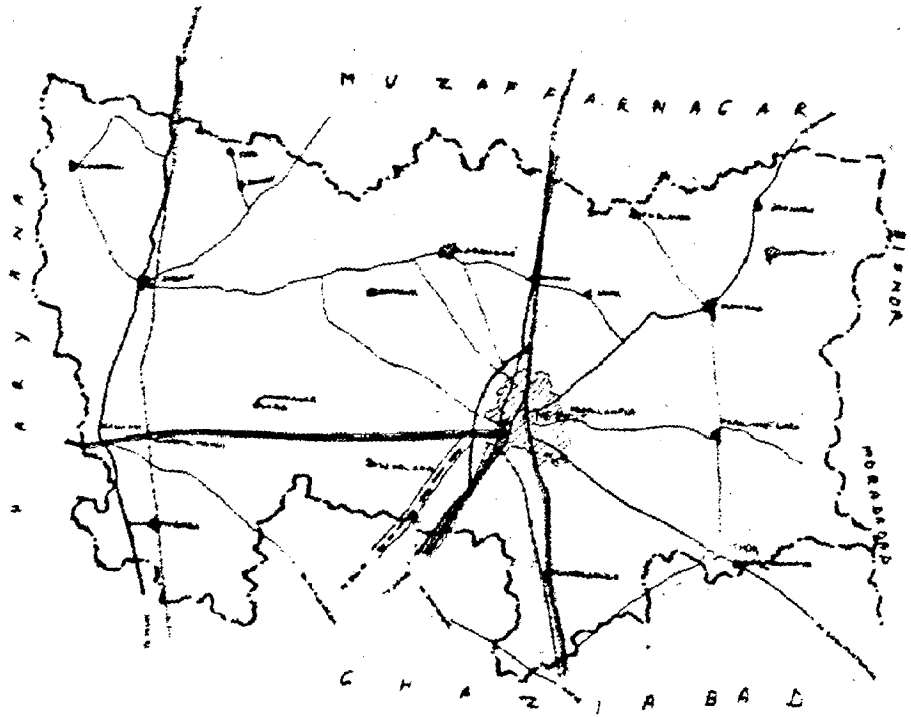
- REGIONAL CENTRE
- SUB-REGIONAL CENTRE
- SERVICE CENTRE
- BASIC VILLAGE
- URBAN SETTLEMENTS

NARENDRA SINGH
M.U.R.P. II
1990 - 91

GROWTH DYNAMICS OF MEERUT DISTRICT

[MAP NO. 18]

PROPOSED TRANSPORT NETWORK



LEGEND

EXISTING

STATE HIGHWAY

MAJOR DISTRICT ROAD

OTHER ROAD

RAILWAY LINE BROAD GAUGE

URBAN SETTLEMENT

PROPOSED

EXPRESS WAY

THE LINK HIGHWAY (PROPOSED)

BROAD GAUGE DOUBLE RAILWAY LINE

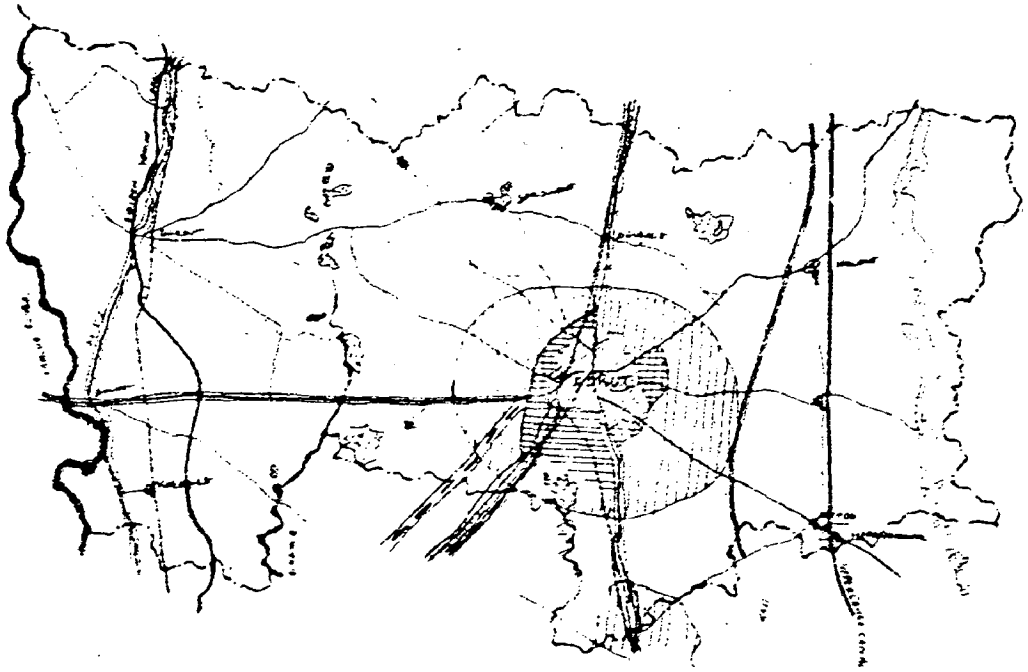
▲

MARKINGS OVER MAP I 1986 - 91

GROWTH DYNAMICS OF MEERUT DISTRICT

[MAP NO.- 19]

PROPOSED LAND USE - 2001



LEGEND

- STATE BOUNDARY
- DISTRICT BOUNDARY
- TEHSIL BOUNDARY
- STATE HIGHWAYS
- MAJOR DISTRICT ROADS
- OTHER ROAD
- RAILWAY LINE BROAD GAUGE
- RIVERS
- CANALS
- URBAN SETTLEMENT - 1987

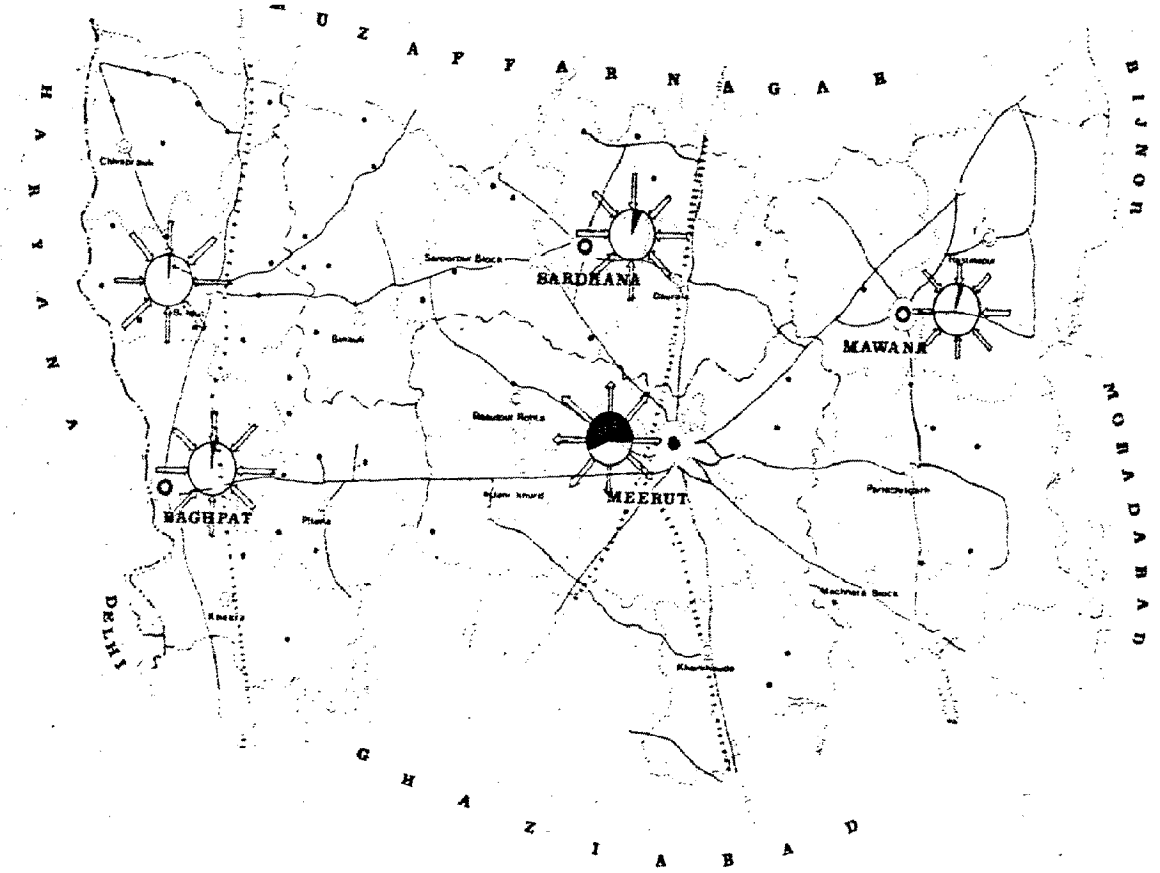
PROPOSED

- URBANISABLE AREA - 2001
- GREEN BELT / GREEN WEDGE
- FOREST
- EXPRESS WAY
- RAILWAY LINE (B.G. SINGLE TRACK)
- CULTIVATED LAND

GROWTH DYNAMICS OF MEERUT DISTRICT

[MAP NO. 20]

NARENDRA SINGH
M.U.R.P. II
1990 - 91



LEGEND

BOUNDARIES - STATE, DIST. .....
BOUNDARIES TEHSIL, VIKASKHAND .....
IMPORTANT METALLED ROADS
RLY. LINE WITH STNS. - B.G.
RIVER AND STRLAM, CANALS
HEADWATERS - DIST, TEHSIL, VILLAGE BANK
URBAN CENTRE. .....
VILLAGE HAVING POP. 5000 & ABOVE.

EXISTING PATTERN OF MIGRATION & PROPOSALS FOR CHANGE

GROWTH DYNAMICS OF MEERUT DISTRICT

[MAP NO. 21]

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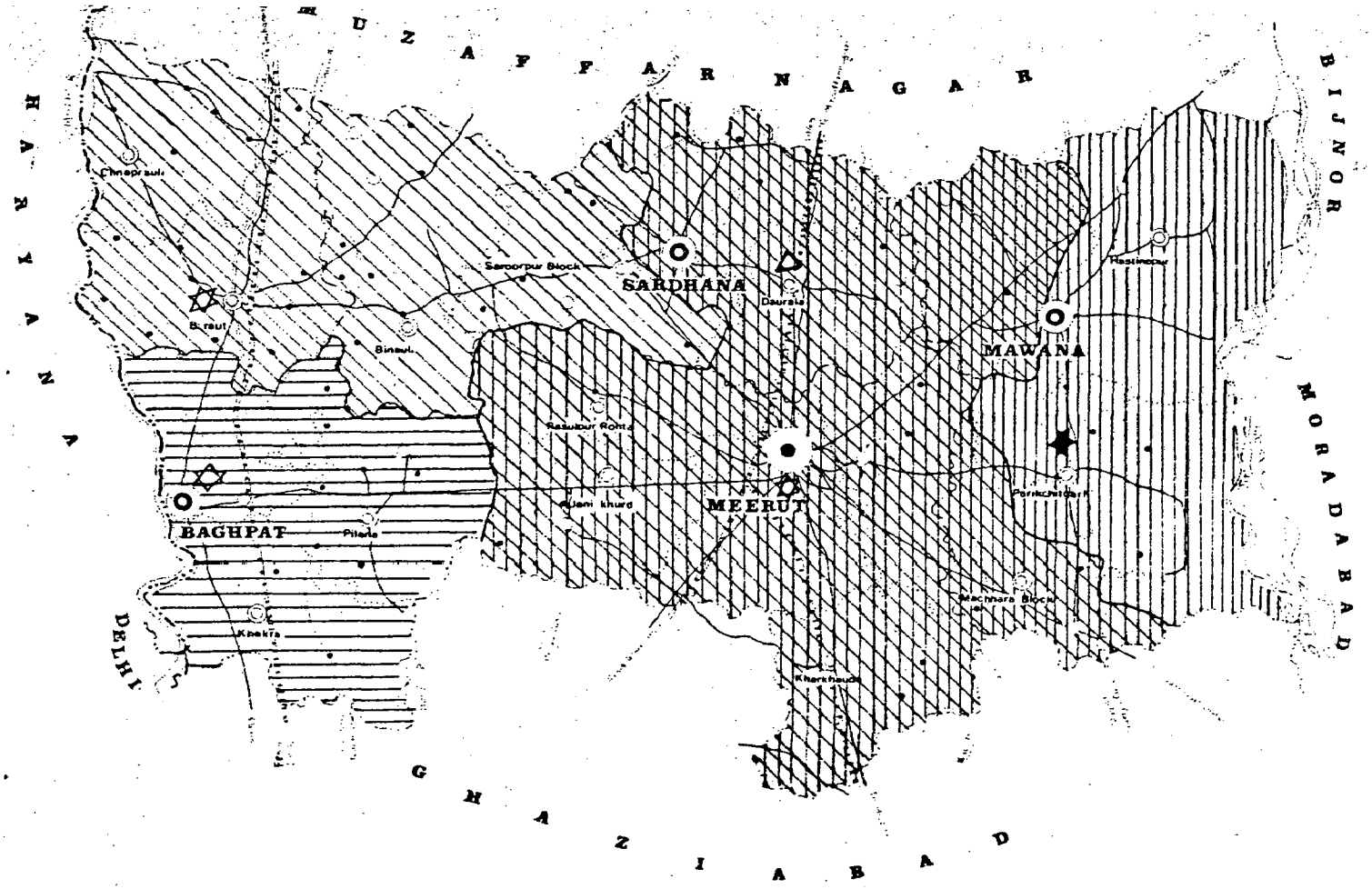

LEGEND

- BOUNDARIES- STATE, DIST.
- BOUNDARIES- TEHSIL, VIKASKHAND
- IMPORTANT METALLED ROADS
- R.L.Y. LINE WITH STNS.-B.G.
- RIVER AND STREAM, CANALS
- HEADQUARTERS- DIST, TEHSIL, VIKASKHAND
- URBAN CENTRE
- VILLAGE HAVING POP. 5000 & ABOVE
- PROPOSED AREAS FOR
- SUGARCANE (perennial crop)
- WHEAT (Rabi seasonal crop)
- MIXED CROPS (Rabi & Kharif)
- VEGETABLES
- EXISTING MANDIS
- PROPOSED MANDIS
- EXISTING SUGAR MILL

PROPOSED CROPPING PATTERN & LOCATION OF MANDIS

GROWTH DYNAMICS OF MEERUT DISTRICT

[MAP NO-22]

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M.U.R.P II (1990-91)
U O R
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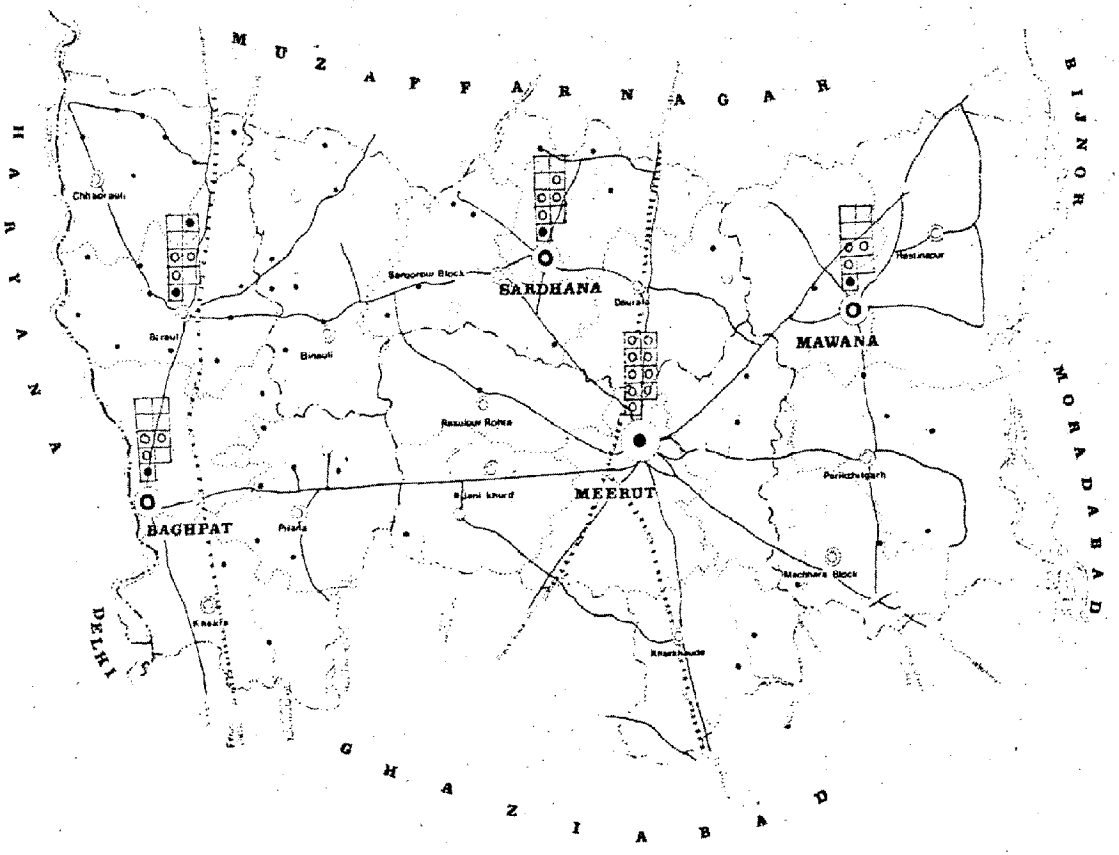

BOUNDARIES - STATE, DIST. . . . . .
BOUNDARIES - TEHSIL, VIKAS KHAND . . . . . .
IMPORTANT METALLED ROADS . . . . . .
R.Y. LINE WITH STNS - D.G. . . . . .
RIVER AND STREAM, CANALS . . . . . .
HEADQUARTERS - DIST., TEHSIL, VIKAS KHAND
URBAN CENTRE . . . . . .
VILLAGE HAVING POP. 5000 & ABOVE . . .

EXISTING FACILITIES ○
PROPOSED FACILITIES ●

EDUCATIONAL FACILITIES

1. UNIVERSITY
2. ENGG. TRAINING CENTRE
3. PROFESSIONAL COLLEGES
4. COLLEGES
5. HIGH SECONDARY SCHOOLS
6. MIDDLE SCHOOLS

HEALTH FACILITIES
7. DISPENSARY
8. HOSPITAL
9. VETERINARY HOSPITAL

PROPOSED EDUCATIONAL AND HEALTH FACILITIES

Nivedita Singh
MURP II (1990-91)
U O R
ROORKEE

GROWTH DYNAMICS OF MEERUT DISTRICT

MAP NO. 23

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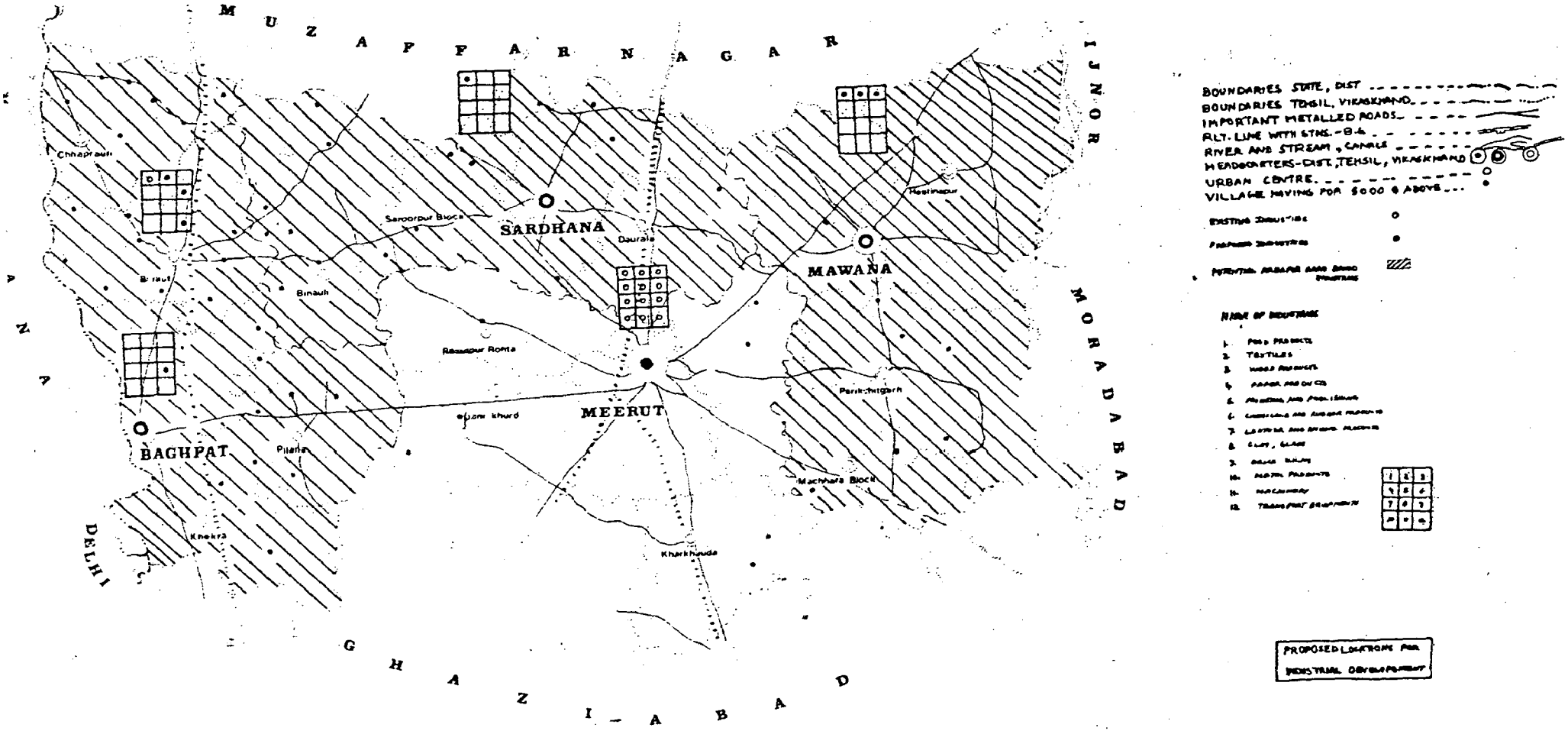

Narendra Singh
M.U.R.P. II (1990-91)
U O R
ROORKEE

GROWTH DYNAMICS OF MEERUT DISTRICT

[MAP NO. 24]

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3.2.3 PROPOSED STRATECY :

1. Rural areas of this sub-region are more developed by economic and infrastructure point of view in comparison to the other rural area of U.P. Per Hectare agricultural production is more in this area. There is lack of agricultural markets and also the distribution is unbalanced so it is necessary to provide these facilities.

2. Due to the improper distribution of rural settlements these settlements are far away from each other. Hence it is proposed that basic facilities of low standard should be provided to each village and the higher standard facilities should be provided in service centres as well as Basic villages.

3. Some training programmes should be arranged in rural area for non-agricultural workers so that their works can be improved and employment opportunities can increase.

4. Some ribbon development are emerging near the urban centres which is developing on both side of the road and the back portion of these rural settlements remains undeveloped. So it is necessary to locate these settlement by preparing a village development plan and the land uses in these village should be restricted.

5. Housing problem is also accute in villages. So it is proposed to provide middle and lower class housing facilities specially for economically weaker section.

6. Some training programmes should be arranged for rural population so that they can participate and understand the working of different rural bodies.

7. The district has strong export base for consumer and capital goods. This needs reorganisation by providing accessibility by rail and road, railway siding and goods shads. Truck terminal facilities, telephone facilities, and space for wholesale markets with adequate facilities.

Following recommondations are in the regional plan for rail facilities.

a) To fulfill the extra requirement of passengers movement in the present rail facilities.

b) To lay out one more line between Murad Nagar and Meerut centt and electrification of whole section.

PROPOSALS FOR ROAD TRANS PORTATION :

a) Construction of express way on new parallel alignment
b) Improvement of state Highways
c) Sub-Regional road facilites.

8. Literacy in the district is high as compared to state average. But formal litaracy should be transformed into functional literacy through development of skills for men and women. There should be more (three training

centres are already existing in the district) industrial and vocational training centres in the urban and rural areas.

9. Soil fertility has to be maintained by providing low priced, adequate fertilizers of good quality to the farmers in the villages.

10. There should be proper management of water distribution by canals so as to minimise the gap between irrigated and unirrigated areas (which is 30% of cultivable areas).

11. Meerut district has the potentials for development in agriculture and industries. There is a need to frame a policy for the change in cropping pattern through incentives.

MODEL I

GROWTH DYNAMICS OF POPULATION

SECTOR	ELEMENTS OF GROWTH DYNAMICS.	HELPING ELEMENTS OF GROWTH DYNAMICS.	HURDLES IN GROWTH	OBSERVATIONS.
POPULATION.	1) POPULATION GROWTH IN RURAL AND URBAN AREAS.	- WORKING FORCE.	1) DEPENDENCY RATIO IS HIGH.	1) LITERACY IS VERY HIGH AS COMPARED TO WHOLE OF WESTERN U.P.
	2) INCREASE IN LITERACY (RURAL/ URBAN AREAS)	- LITERACY.	2) LITERACY LEVEL ARE LOW.	2) SLOW URBANISATION PROCESS CAN MEET THE EMPLOYMENT DEMAND.
	3) WORKING FORCE.	- MIGRATION.	3) SKILL LEVELS OR MIDDLE LEVEL AND HIGH LEVEL SKILL IS LOW IN OTHER WORDS QUALITY OF POPULATION IS LOW.	
	4) MIGRATION.		4) URBAN POPULATION GROWTH APPREAS TO BE SLOW. PERHAPS DUE TO SLOW GROWTH OF THE SECTOR OF THE ECONOMY AND PREDOMINANCE OF TERTIARY ACTIVITY. THIS TREND HAS RESULTED IN CONTINUOUS PRESSURE ON LAND IN RURAL AREAS.	
	5) URBANISATION WITH RESPECT N.C.R.			
	6) SEX RATIO.			
	7) URBANISATION WITH RESPECT TO WESTERN U.P.			
	8) DENSITY.			

MODEL II

GROWTH DYNAMICS OF AGRICULTURE

Sector	Elements of Growth Dynamics.	Helping elements of growth dynamics.	Rurdles in growth.	Observations.
AGRICUL-TURE	CLIMATE SOLIS TOPOGRAPHY LAND UTILIZATION IRRIGATION TYPES CULTIVABLE AREA IRRICATED AREA CROPPING PATTERN AND SHIFT FROM 1961 TO 1981.	FERTILITY OF SOIL FLAT LAND (PLAIN) IRRIGATION FACILITIES HIGHER WATER TABLE SHIFT FROM CEREALS TO CASH CROPS. MOST OF THE LAND CAN CULTIVATE. MARKET FACILITIES FOR AGRICULTURAL PRODUCE. AVAILABILITY OF CON- SUMPTION MARKETS OF AGRICULTURAL PFRODUCE (LIKE DELHI) INTRA-LINKAGES OF ROADS HELPING IN THE MOVEMENTS OF AGRICUL- TURAL PRODUCE. ACRICULTURAL IMPLI- MENTS.	DECREASING TREND OF SOIL FERTILITY. MISMANAGEMENT OF WATER DISTRIBUTION. DISTANCE BETWEEN INDUSTRIES AND FIELDS. DISTRIBUTION OF SEEDS. SLOW ACCEPTANCE OF H.Y.V. SMALL LAND HOLDINGS.	AGRICULTURE IS SHOWING SLOW PROGRESS. LAND POTENTIALS HAVE TO BE USED FULLY. IRRIGATION HAS TO BE TAKEN CARE.

MODEL III

GROWTH DYNAMICS OF INDUSTRY.

SECTOR	ELEMENTS OF GROWTH DYNAMICS.	HELPING ELEMENTS OF GROWTH DYNAMICS.	HURDLES IN GROWTH.	OBSERVATIONS
INDUSTRY	1) GROWTH IN INDUSTRIAL WORKERS. 2) TYPE OF INDUSTRIES. 3) NO.OF INDUSTRIAL UNITS BY TYPES.	- TYPES OF INDUSTRIES - INTER AND INTRA REGIONAL LINKAGES. - INWARD FLOW OF RAW MATERIALS. - AVALLABILITY OF MARKET FOR CONSUMPTION OF FINISHED PRODUCTS. - AVAILABILITY OF WORKING FORCE. - AVAILABILITY OF CAPITAL. - AVAILABILITY OF POWER?	- NON AVAILABILITY OF MINTERALS ESPECIALLY IRON ARE IN THE REGION.	- ALL TYPES OF INDUSTRIES ARE SHOWING DEVELOPING TREND. - EXISTING INDUSTRIES CAN BE DIVIDED INTO FOLLOWING CATEGORIES:- 1) INDUSTRIES DIRECTLY CONTRIDUTING TO AGRICULTURAL DEVELOPMENT LIKE FERTILIZERS. TRACTORS AGRICULTURAL MACHINERY, IRRIGATION PUMPS, PIPES ROAD BUILDING MACHINERY ETC. 2) AGRO-BASED INDUSTRIES DERIVING THEIR RAW MATERIALS FROM AGRICULTURAL PRODUCE VIZ. SUGAR? PAPER PULP FORMENTATION INDUSTRY? FOOD PROCESSING AND PRESERVATION, OIL DRUGS ETC. 3) FOREST BASED INDUSTRIES VIZ PAPER AND PULP, PAPER BOARD, PLAYWOOD? TURPENTINE. 4) CERAMIC INDUSTRIES SUCH AS CEMENT AND BRICK KILNS.

MODEL IV

GROWTH DYNAMICS OF TRADE AND COMMERCE

SECTOR	ELEMENTS OF GROWTH DYNAMICS	HELPING ELEMENTS OF GROWTH DYNAMICS	HURDLES IN GROWTH	OBSERVATIONS
TRADE AND COMMERCE.	1. WORKERS IN TRADE AND COMMERCE 2. NO. OF FIRMS WITH EMPLOYMENT. 3. TYPE OF TRADE IN THE MAJOR DISTRICT CENTRES. 4. INWARD FLOW OF RAW MATERIAL. 5. OUTWARD FLOW OF FINISHED PRODUCTS.	- TYPE OF TRADES - CLOSENESS OF IMPORTANT CENTRES FROM THE MAIN ROADS AND RAILWAY NETWORK. - BANKING FACILITIES TRANSACTION BY BANKS PER DAY IS MORE THAN ONE CRORE. S.B.I. IS THE LEADING BANK.	- CONGESTION - TRANSPORTATION - AVAILABILITY OF GODOWNS. - PARKING SPACE.	- IT IS A DOMINATING SECTOR OF THE ECONOMY OF THE DISTRICT. 33% OF THE TOTAL WORKING FORCE WERE ENGAGED IN 1971. - WHOLESALE TRADE IS A MAIN FUNCTION OF THE DISTRICT. - CHIEF EXPORTING MATERIALS ARE GRAIN, COTTON AND SUGAR. - GHAZIBAND IS THE MAIN CENTRE FOR CHANNELING THE SUPPLIES BY THE OR TO THE REGION. - HAPUR AND BARAUT IS THE LOCAL POINTS FOR THE TRADE OF GOOD GRANS. OTHER THAN THIS MEERUT, PILKHUWA ARE ALSO IMPORTANT CENTRES. - FOOD GRAINS? PULSES, PEAS AND OIL SEEDS COVER AS A WIDE AREA EXTENDING OVER THE WHOLE OF NORTHERN INDIA.

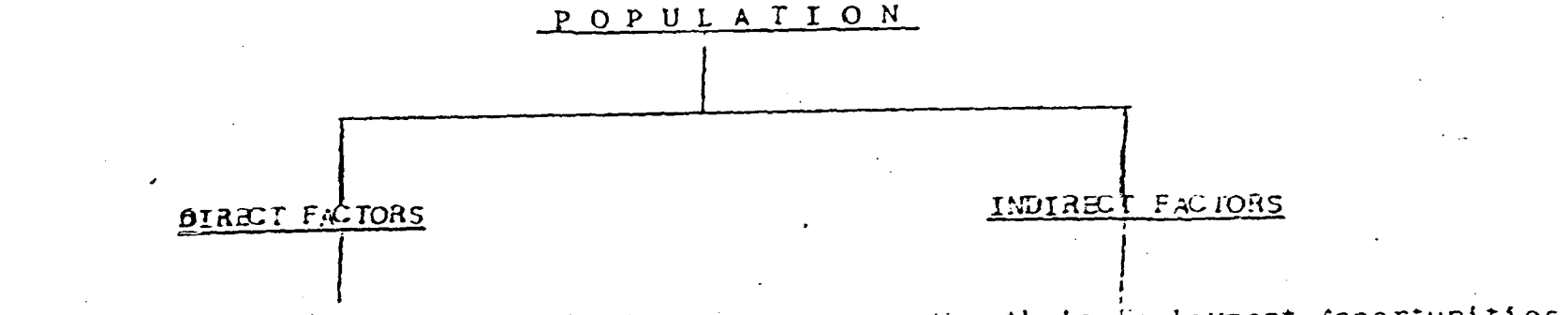
5) INDUSTRIES MANUFACTURING CONSUME MACHINCAL AND ELECTRICAL GOODS BASED ON THE COMSUMPTION OF ELECTRIC POWER.

FIRST TWO CATEGORIES ASSISTING AGRICULTURAL OPERATION AND INDUSTRIES BASED ON AGRICULTRAL PRODUCE CAN BE ADVANTAGEOUSLY DEVELOPED IN THE GROWTH CENTRES.

MODEL V

GROWTH DYNAMICS OF TRANSPORT AND COMMUNICATION

SECTOR	ELEMENTS OF GROWTH DYNAMICS	HELPING ELEMENTS OF GROWTH DYNAMICS	HURDLES IN GROWTH	OBSERVATIONS
TRANS-PORT AND COMMU-NICA-TION.	1. Availability. 2. WORKERS IN TRANSPORT AND COMMUNICATION. 3. MOVEMENT OF PASSENGERS. 4. MOVEMENTS OF GOODS.	-WELL CONNECTED WITH LONG DISTANCE RAIL AND ROAD ROUTES TO THE OTHER ECONOMIC GROWTH POINTS IN THE COUNTRY. GHAZIABAD, HAPUR AND MEERUT ARE THE IMPOR-TANT RAILWAY JUNCTIONS. -LARGE EXPANSION IN WORKERS.	CONGESTION ON ROADS IN CITIES INCREASE IN PRICES AS OF PETROL. IT WAS ONLY Rs. 7.15 IN 1981 AND NOW Rs. 12.25.	-CONVERGENCE OF NATIONAL AND STATE HIGHWAYS AND OTHER IMPORTANT ROADS AND RIAL CONNECTIONS WIT IN THE REGION HAS CONSTANTLY RESULTED IN INCREASING THE INTRA-REGIONAL AND INTER REGIONAL FLOW OF GOODS AND PEOPLE. FAST EXPANSION OF INDUSTRIES IN MEERUT? MODI-NAGAR, GHAZIA-BAD ARE THE RESULT OF THE WELL CONNECTIVITY WITH THE REGION.



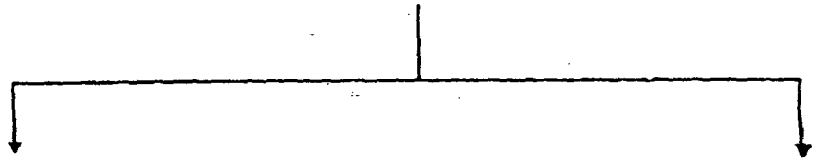
1. Change in Population Distribution and Concentration.
2. Variation in Population size.
3. Change in Literacy (Technical)
4. Change in Workers.
5. Shift in Occupation (P--- S--- T)

1. Growth in Employment Apportunities within the region.
2. In or Out Migration for Employment and Education.

MODEL No. 1

A G R I C U L T U R E

(Factors of Growth - Increase in intensity of agriculture, shifts towards cash crops)



DIRECT FACTORS

1. Climate.
2. Soil fertility.
3. Better Irrigation.
4. Improved Seeds.
5. Technology.

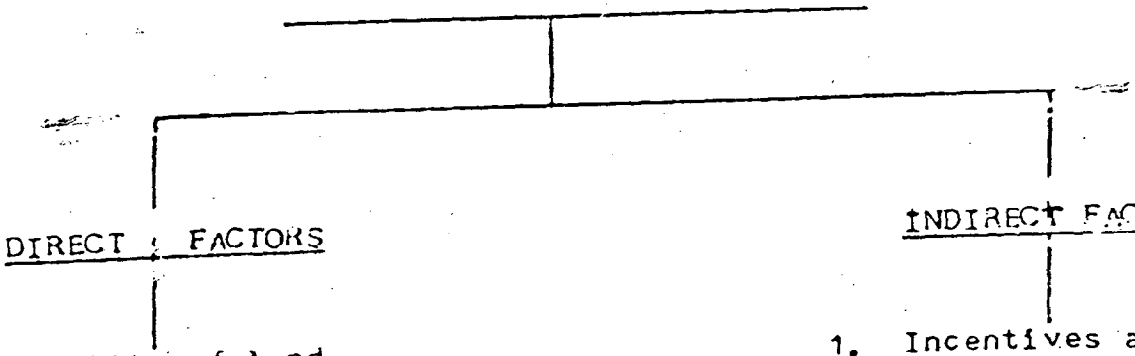
INDIRECT FACTORS

1. Cropping pattern.
2. Better education for farmers.
3. Stability in agricultural produce price
4. Land consolidation.
5. Lowering of average distances from villages to nearest market.

MODEL No. 2

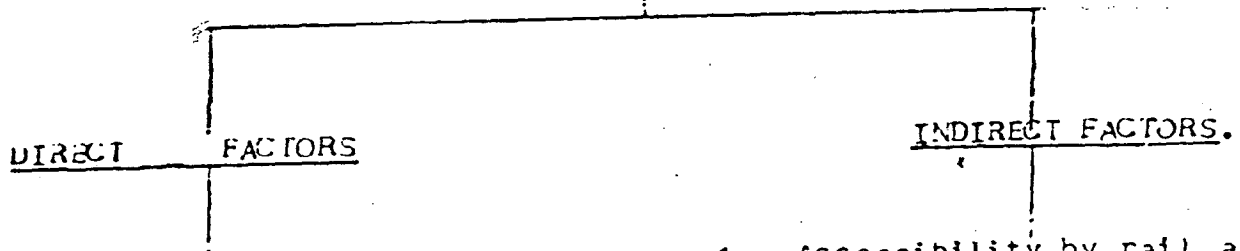
I N D U S T R I E S

(Faotore of Growth -) Industries, Industrial types, employment, investment, per capita income of industrial workers, industrial products, Local material consumption and raw materials from the other parts.



MODEL NO. 3

TRADE AND COMMERCE
(FACTORS OF GROWTH)



DIRECT FACTORS

1. Location and type of mandies and markets.
2. Transport NODALITY.
3. Rich hinterland.

INDIRECT FACTORS.

1. Accessibility by rail and ro
2. Truck terminal facilities.
3. Cheap cost of Transportation.
4. Loading unloading facilities.
5. Storage facilities.
6. Financial institutions.
7. Communication network.

MODEL No. 4

TRANSPORTATION AND COMMUNICATION. (FACTORS OF GROWTH).

DIRECT FACTORS

1. Topography.
2. Basic materials (Coaltar, stones etc.)
3. Availability of commutors.
4. Availability of funds for roads and rails.
5. Linkage from living areas to work and recreational places.

INDIRECT FACTORS

1. Cheap cost of construction.
2. Tax on vehicles.
3. Proper check on movements of passengers and goods.
4. Proper maintenance of roads like signals, lanes, round abouts and crossings.

MODEL No. 5

TABLE NO. 1

RAINFALL DATA AS RECORDED BY STATIONS IN MEERUT DISTRICT

Station		No. of years of data	Normal												Extreme			
			January	February	March	April	May	June	July	August	September	October	November	December	Annual	Highest annual rainfall as percentage of normal and year	Lowest annual rainfall as percentage of normal and year	Heaviest rainfall in 2 hours** Amount (mm.)	Heaviest rainfall in 2 hours** Date
Meerut	a	50	30.2	29.7	14.5	11.7	15.2	78.2	229.9	212.6	151.1	33.9	2.5	11.4	810.9	187 (1942)	37 (1907)	227.3	September 17, 1880
	b		2.5	2.5	1.5	0.9	1.6	3.8	10.4	9.9	5.4	0.9	0.3	1.2	40.9				
Sardhana	a	50	26.7	25.7	15.0	11.4	11.7	66.0	208.5	195.3	138.2	20.6	2.8	9.1	731.0	187 (1942)	29 (1918)	345.4	September 18, 1880
	b		2.1	2.0	1.5	1.0	1.3	3.6	9.6	9.6	5.1	0.9	0.3	0.9	37.9				
Mawana	a	50	29.0	29.5	15.2	12.5	16.3	95.8	220.7	217.2	168.1	28.5	3.2	10.7	841.8	164 (1933)	42 (1929)	393.7	September 18, 1880
	b		2.0	2.1	1.3	1.0	1.4	3.8	10.0	9.8	5.8	1.0	0.4	1.0	39.6				
Baghpat	a	50	22.9	22.6	13.5	10.4	14.5	55.1	153.9	160.0	119.9	15.2	2.0	8.4	598.4	182 (1933)	51 (1939)	314.7	August 21, 1952
	b		2.1	1.9	1.3	0.9	1.3	3.3	8.2	8.3	4.4	0.8	0.3	0.9	33.7				
Ghaziabad*	a	50	22.1	19.6	11.9	8.9	12.7	58.4	172.7	152.7	113.0	14.0	1.5	8.9	596.4	248 (1933)	37 (1903)	231.7	September 16, 1903
	b		1.6	1.7	1.2	0.9	1.2	3.0	8.7	7.7	4.5	0.8	0.2	0.8	32.2				
Hapur*	a	50	23.1	23.4	15.5	10.7	14.0	63.0	190.3	195.1	132.3	21.1	2.0	10.4	700.9	223 (1936)	39 (1905)	269.2	July 22, 1867
	b		1.7	2.0	1.3	1.0	1.2	3.4	9.8	9.2	5.5	0.8	0.3	1.0	37.2				
Dasna*	a	25	23.9	28.5	[illegible]	9.1	8.9	74.2	232.9	[illegible]	[illegible]	18.9	0.5	7.9	762.3	192 (1933)	42 (1929)	274.9	September 14, 1957
	b		1.8	2.5	1.1	0.8	0.8	3.7	9.2	8.4	4.8	0.7	0.1	0.7	34.0				
Meerut (District including district Ghaziabad)	a		25.4	25.6	15.2	10.5	13.3	70.1	201.3	190.4	136.9	19.9	2.1	9.5	720.2	169 (1933)	45 (1918)		
	b		2.0	2.1	1.3	0.9	1.3	3.4	9.4	9.0	5.1	0.8	0.3	0.9	36.5				

(a) Normal rainfall in mm.
(b) Average number of rainy-days (days with rain of 2.5 mm. or more)
*Ghaziabad, Dasna and Hapur transferred to the newly formed district of Ghaziabad
**Based on all available data upto 1967

SOURCE: GAZETTIER OF INDIA, UTTAR PRADESH
DISTRICT MEERUT (SUPPLEMENTARY)

TABLE No. 2

DECENNIAL VARIATION IN THE DENSITY OF POPULATION OF DISTRICT AROUND NATIONAL CAPITAL REGION

District/Zone.	Area in sq. miles.	Density in persons per sq. miles.			
		1951	1961	1971	1981
1. Gurgaon.	2,348	382	412	528	727
2. Rohtak	2,331	425	483	617	766
3. Bulandhshahr.	1,889	696	793	920	1097
4. Meerut	2,322	825	992	1180	1450
5. Delhi (U.T)	576	1590	3020	4600	7034
6. U.P.	11,495	498	557	649	778

Source : Development Plan 2001 National Capital Region.

TABLE No. 3

DECENNIAL PERCENTAGE VARIATION OF RURAL/URBAN RATIO OF DISTRICTS AROUND THE NATIONAL CAPITAL

Districts.	1951		1961		1971		1981	
	Rural	Urban %	% Rural	% Urban	% Rural	% Urban	% Rural	% Urban
Gurgaon.	88	12	85.5	14.5	83.4	16.6	81.5	18.5
Rohtak	88.3	11.7	36.5	13.5	86.3	13.7	84.3	15.7
Bulandshahr.	84	16	84.5	15.5	87.3	12.7	86.7	13.3
Meerut.	77.7	22.3	73.1	21.9	79.4	20.6	75.7	24.3
Delhi (U.T.)	24.5	75.5	17.5	52.5	11.3	58.7	10.3	89.7
U.P.	88	12	86	14	86.5	13.5	86.1	13.9

Source : Development plan 2001 National capital Region.

TABLE No. 4

TOWNWISE DISTRIBUTION OF URBAN POPULATION MEERUT DISTRICT 1961, 1971 AND 1981

Sl. No.	Name (As per of 1981 Towns census)	Population			Population Variation			
		1961	1971	1981	1961-71	% Increase	1971-1981	% Increase per decade
1	2	3	4	5	6	7	8	9
1.	Baraut M.B.	22,818	31,264	46,292	+8,446	37	+ 15,028	48
2.	Khekada T.A.	13,937	18,419	24,984	+4,482	32.1	+ 6,565	35.6
3.	Baghpat N.A.	8,437	11,666	17,157	+3,229	38.3	+ 5,491	47.0
4.	Chhapraulit T.A.	8,556	10,893	13,805	+2,337	27.3	+ 2,912	26.7
5.	Agarwal Mandi T.A.	-	7,567	9,353	-	-	+ 1786	23.6
6.	Aminagar Sarai T.A.	4,958	5,637	6,837	+ 679	13.7	+ 1200	21.3
7.	Sardhana M.B.	16,563	22,083	30,138	+5,520	33.3	+ 8,055	36.5
8.	Lawar T.A.	6,556	8,834	11,535	+2,278	34.7	+ 2701	30.6
9.	Tikri T.A.	-	9,631	11,315	-	-	+ 1684	17.7
10.	Doghat T.A.	-	8,074	10,019	-	-	+ 1945	24.1
11.	Karnawal T.A.	7,253	8,092	9,895	+ 839	11.6	+ 1803	22.3
12.	Daurala T.A.	5,984	7,413	9,146	+ 1429	23.9	+ 1733	23.4
13.	Mawana M.B.	20,677	24,858	37,620	+ 4181	20.2	+ 12,762	51.3
14.	Kithaur T.A.	7,337	9,780	13,791	+2,443	33.3	+ 4,011	41.0

Contd...2..

1	2	3	4	5	6	7	8	9
15.	Hastinapur N.A.	6,712	8,889	11,637	+ 2,177	32.4	+ 2748	30.9
16.	Parikshitgarh T.A.	4,832	7,625	11,328	+ 2,793	57.8	+ 3703	48.5
17.	Phalauda T.A.	-	8,180	10,357	-	-	+ 2177	26.6
18.	Shahjahanpur L.T.	6,214	7,340	8,867	+ 1126	18.1	+ 1527	20.8
19.	Bahsuma T.A.	-	6,834	7,906	-	-	+ 1072	15.7
20.	Meerut M.B.	2,04,937	2,70;993	417,395	+66,056	32.2	+1,46,402	54.0
21.	Meerut cantt.	78,365	85,415	94,210	+ 7059	9.0	+ 8795	10.3
22.	Kankar Khera T.A.	10,856	15,352	20,716	+ 4496	41.4	+ 5364	34.9
23.	Baksar Khera T.A.	-	2,912	4,294	-	-	+ 1382	47.5
24.	Sewal Khas T.A.	6,658	8,082	10,278	+ 1424	21.4	+ 2,196	27.2
25.	Kharkhauda T.A.	5,178	6,547	8,708	+ 1,369	26.4	+ 2,161	33.0
26.	Abdullapur T.A.	3,542	4,774	6,383	+ 1,232	34.8	+ 1,609	33.7

Source : District census Handbook of Meerut District 1961, 1971 and 1981.

TABLE No. 5

DECENNIAL CHANGE IN AREA AND DENSITY OF POPULATION FOR RURAL/ URBAN AREAS OF TEHSILS IN MEERUT DISTRICT DURING 1961, 1971 AND 1981.

Sl. No.	Tehsil	Area in Square Km.			Density Persons/Sq. Km		
		1961	1971	1981	1961	1971	1981
1.	Bhagpat						
	Rural	1030.8	1025.6	1020.1	444	504	568
	Urban	13.2	16.3	22.6	2361	3,210	3,612
	Total	1044.0	1044.0	1044.0	469	544	5,72
2.	Mawana						
	Rural	1116.3	1108.5	1100.2	262	322	3,82
	Urban	8.3	11.7	19.9	3136	3,523	3,996
	Total	1124.0	1124.0	1124.0	284	3,56	4,02
3.	Meerut						
	Rural	655.3	647.5	815.6	443	5,49	6,04
	Urban	59.0	67.1	85.0	4986	6,041	6,895
	Total	714.8	714.8	900.6	819	1,045	1,234
4.	Sardhana						
	Rural	885.8	885,8	885.8	389	4,63	5,59
	Urban	0.3	0.3	0.3	4921	6,495	7,885
	Total	886.0	886.0	886.0	408	488	5,72
	District(Total)						
	Rural	5871.5	5845.6	3762.3	392	453	5,14
	Urban	142.5	170.9	148.7	4136	5212	6,424
	Total	6014.0	6014.0	3911.0	465	498	5,38

Source : District census Handbooks of District Meerut 1961, 1971, 1981.

TABLE No. 6

SEX RATIO FEMALES PER '000' MALES IN THE TEHSILS OF MEERUT DISTRICT DURING 1961, 1971 & 1981.

Sl. No.	TEHSIL	Sex Ratio Famales/000 males 1961			Sex Ratio Females/000 males 1971			Sex Ratio F males/000 males 1981		
		Total	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban
1.	Baghpat	850	854	781	836	836	855	834	830	856
2.	Sardhana	845	843	869	832	830	871	837	833	860
3.	Meerut	830	854	804	823	831	816	840	830	850
4.	Mawana	846	845	838	835	832	864	838	830	868
Meerut District		843	853.	805	831	836	816	838	831	854

Source : District census Handbook of Meerut District 1961, 1971 & 1981.

TABLE No. 7

Professional and Technical Education in 1987-88.

Type of Institution	No. of Institution
Medical	1
Industrial training Institute	2
Institute Productivity & Management	1
Technical School	1
Polytechnic	2
Normal School	2

SOURCE: STATISTICAL HAND BOOK, DISTRICT MEERUT 1989

TABLE - 8

LITERACY IN MEERUT DISTRICT

District/ Tehsil	1961			1971			1981		
	P	M	F	P	M	F	P	M	F
Meerut District									
T	21	35	14	22	38	16	35	47	20
R	16	31	9	18	34	10	30	43	19
U	42	49	31	44	53	34	45	54	31
Baghpat Tehsil									
T	18	31	10	22	36	11	33	46	17
R	17	32	8	23	35	9	31	44	15
U	37	46	26	41	49	28	43	54	31
Sardhana									
T	18	29	15	29	35	17	31	43	15
R	17	28	15	27	35	17	30	43	14
U	27	36	20	27	38	21	34	45	21
Mawana									
T	18	28	10	23	31	11	30	42	15
R	18	27	9	21	31	10	29	42	13
U	29	35	20	31	37	21	32	42	21
Meerut									
T	32	43	22	35	45	24	40	51	27
R	18	32	8	27	34	9	30	44	14
U	46	52	35	47	55	37	49	58	40

SOURCE: STATISTICAL DEPT.

T A B L E No. 9

WORKING FORCE 1981

Tehsil	Primary Sector	Secondary Sector	Tertiary Sector
Baghpat			
R	16	15	69
U	54	24	22
Sardhana			
R	15	14	71
U	47	35	22
Mawana			
R	13	9	71
U	57	19	24
Meerut			
R	19	17	54
U	68	27	5

Source : District census Hand Book Meerut 1981.

T A B L E No. 10

DISTRIBUTION OF WORKING FORCE IN SECTOR ECONOMICS MEERUT DISTRICT 1981 .

TEHSILS.	PERCENTAGE OF WORKING FORCE											
	Total Workers.			Primary sector			Secondary sector		Tertiary sector			
	Total	Rural	Urban	Total	Rural	Urban	Total	Rural	Ur-ban	To-tal	Ru-ral	Ur-ban
1. Baghpat	27	27	26	69	73	21	13	12	24	18	15	54
2. Mawana	28	28	23	71	76	24	12	11	17	16	12	59
3. Meerut	27	27	28.4	33	64	5	22	18	27	45	18	68
4. Sardhana	27	27	27	68	71	22	15	14	34	17	16	34
Meerut District	28	30	28	55	70	9	18	14	32	27	16	60

Source : District census Hand Book of Meerut District 1981.

TABLE No. 11

A COMPARATIVE STATEMENT OF POPULATION GROWTH OF MEERUT DISTRICT WITH NEARBY DISTRICTS OF U.P. (1971)

Districts.	POPULATION GROWTH			% OF URBAN POPULATION TO TOTAL POP.			DENSITY (Sq. Km.)		
	1961-1971	1971-1981	Difference	1971	1981	Difference	1971	1981	Difference
1. Meerut	18.3	+23.4	5.1	20.6	24.4	3.8	450	563	113
2. Ghaziabad	16.2	+21.4	5.2	18.3	21.8	3.5	348		
3. Bulandshahr.	15.8	+19.4	3.6	12.7	13.2	0.5	292	424	76
4. Saharanpur.	19.3	+27.5	7.9	23.0	21.2	-1.3	428	373	81
5. Muzaffarnagar	18.3	+24.5	5.2	13.2	13.3	0.6	207	429	1
6. Badaun	12.8	+16.5	3.7	8.4	9.6	1.2	298	319	112
7. Rampur	25.3	+28.5	3.2	20.8	19.5	-1.3	206	380	82
8. Muradabad	19.7	+22.8	3.1	22.2	24.4	2.2	349	408	202
9. Aligarh	14.4	+19.7	5.7	16.2	17.2	1.0	286	421	72
10. Mathura	17.4	+20.7	3.7	16.8	17.3	0.5	194	340	54
11. Etah	15.6	+20.7	5.1	9.6	9.8	0.2	362	452	158
12. Bareilly	16.5	+20.37	3.8	22.1	22.3	0.2	310	431	69
13. Western zone of U.P.	17.6	+22.1	4.5	17.2	17.5	0.3	242	403	93
14. Uttar Pradesh	16.7	+19.7	3.0	12.9	16.6	1.7		300	58

SOURCE : CENSUS OF INDIA, UTTAR PRADESH
1961, 71 & 81

T A B L E No. 12

TOWN WISE MIGRATION 1981.

Sl.No.	Name of the Town	Percentage
1.	Meerut	62
2.	Sardhana	12
3.	Baghpat	9
4.	Mawana	5
5.	Baraut	4

SOURCE: CENSUS OF INDIA, UTTAR PRADESH 1981

T A B L E No. 13

SOIL CLASSIFICATION AND AREA UNDER EACH CATEGORY.

MEERUT DISTRICT .-

Type of the Soil	Area in sq. Km.	%age of total
1. 'Bhur' or pure sand.	884	22.6
2. Sandy Loam.	1424	36.4
3. Domat or Loamy.	430	11.0
4. Dhakar or clayey soils.	372	9.5
5. Khaddar or stiff clay.	524	13.4
6. Usar or saline soils.	242	6.2
7. Kankar.	35	0.9
TOTAL	3911	100

Source : State statistical Department, Uttar Pradesh.

TABLE No. 14

FOREST RESOURCES : MEERUT DISTRICT

Location	Area Earmarked For a forestation(Acreage)	Area actually under forest		Types of forests.
		Acerage.	(=3 as percent 2)	
I. WASTELAND				
A. Waterlogged areas	12968	2950	23%	Evergreen Forests.
B. Riverian Tract against soil erosion.	133400	26060	19.5%	Evergreen and deciduous.
II. CANAL				
Plantation	12935	950	7.4%	Deciduous
III. ROAD SIDE PLANTATION	202	123	61%	Evergreen and Deciduous.
Total	1,59,505	30083	18.9%	

i.e. 250 sq. Km.

6.4% of the area of the district.

SOURCE : Deputy Conservator of Forests, Uttar Pradesh.

TABLE No. 15

LAND USE IN THE MEERUT DISTRICT, TEHSILWISE : 1987-1988
(Percentage of Total land)

Sl. No.	Tehsil	Total area	Land under	Land under settlement, roads etc.	Grave yard.	Uncult-urable land	Garden	For-est	Culti-vated & cultur-able land
1.	Baghpat	1,044	4.10	5.60	0.26	1.65	0.38	Nil	88.01
2.	Mawana	1124	4.90	4.50	0.18	3.20	0.34	1.40	85.48
3.	Meerut	900,6	2.38	6.22	0.37	4.25	1.36	0.82	84.60
4.	Sardhana	886	2.46	4.90	0.29	2.25	0.50	0.25	89.35
	Total	6,016,3	3.22	5.48	0.23	3.42	0.61	0.42	86.62

Source : Revenue Records of Meerut District.

TABLE No. 16

POTENTIAL AND ACTUAL IRRIGATED AREA, MEERUT DISTRICT
1987 - 88 (IN HECTARES)

Sl.No.	Source of Irrigation	Potential Irrigation Area	Area actually Irrigation
1.	Canal	1,38,111	80,277
2.	Tubewells	3,32,209	2,20,737
3.	Wells	3,834	2,050
4.	Ponds & Lakes etc.	69	37
5.	Other Sources.	1564	674
6.	Total	4,75,787	3,03,775

Source : State Statistical Department, Uttar Pradesh.

TABLE No.17

IRRIGATED & NON IRRIGATED AREA : MEERUT DISTRICT

Sl. No.	Name of the Block	Area in acres		
		Cultivated	Irrigated	Unirrigated
1.	Binauli	58700	33028	25672
2.	Sardhana	32436	27659	4777
3.	Saroorpur	39147	24259	14890
4.	Daurala	34754	21170	13584
5.	Pilana	45972	34371	11601
6.	Bhagpat	35525	27687	7838
7.	Khekra	39653	19947	19706
8.	Baraut	58355	47576	10779
9.	Chhaprauli	34713	27283	7430
10.	Khar Khauda	53000	33400	19600
11.	Mawana	19480	14498	4982
12.	Parikshit Garh	48559	36083	12476
13.	Machhra	34722	27768	6954
14.	Hastinapur	19909	11596	8313
15.	Meerut	29458	22328	7130
16.	Rasoolpur Rohta	33539	22411	1128
17.	Jani Khurd	36627	25039	1588
18.	Rajpura	35412	25926	9486

SOURCE: STATISTICAL HAND BOOK, 1989
DISTRICT MEERUT

TABLE No. 18

AGRICULTURAL CROP PATTERN : MEERUT DISTRICT

(Primary Crops)

Sl. No.	Name of the Block	Area in acres under				
		Wheat	Barley	Rice	Sugar	Cotton
1.	Binauli	17000	100	1000	8700	1500
2.	Sardhana	11700	200	1500	13000	300
3.	Saroorpur	12100	200	2000	9500	550
4.	Daurala	10700	100	1400	12300	300
5.	Pilana	14200	600	100	9600	1300
6.	Bhagpat	13400	100	600	10000	800
7.	Khekra	15000	400	150	4300	600
8.	Baraut	16500	50	1200	14800	1000
9.	Chhapraulí	12000	10	1300	12400	1200
10.	Kharkhauda	12800	1200	2000	14700	950
11.	Mawana	14000	2050	1000	14000	400
12.	Parikshit Garh	9600	350	6600	11200	850
13.	Machhra	12000	700	2200	12300	700
14.	Hastinapur	11000	700	9000	11400	200
15.	Meerut	6000	350	3000	8300	300
16.	Rasoolpur Rohta	8500	100	1800	10300	1140
17.	Jani Khurd	8000	300	1300	12900	1500
18.	Rajpura	12400	300	1000	17000	250

SOURCE: STATISTICAL HAND BOOK, 1989
DISTRICT MEERUT

TABLE - 19

AGRICULTURAL CROP PATTERN : MEERUT DISTRICT

(SECONDARY CROPS)

Sl. No.	Name of the Block	Area in acres under.					
		Gram	Peas	Rulses	Dals	Jawar	Bajra
1.	Binauli	9000	700	310	100	8300	0
2.	Sardhana	4200	2300	420	7450	1400	0
3.	Saroorpur	4000	9500	400	3500	2500	0
4.	Daurala	2200	3000	370	4700	1000	60
5.	Pilana	1300	4700	400	1100	3200	60
6.	Bhagpat	1000	3600	300	8530	5200	10
7.	Khekra	2700	460	332	8350	1100	6300
8.	Baraut	2000	3900	322	5750	1560	0
9.	Chhapraulí	2700	1100	380	5980	5600	0
10.	Khar Khauda	1900	1130	600	5650	2900	0
11.	Mawana	2500	5000	250	4250	1350	450
12.	Parikshit Garh	1300	5500	350	9400	450	8600
13.	Machhra	600	5100	300	4950	670	0
14.	Hastinapur	1200	4000	300	1000	400	0
15.	Meerut	700	3600	250	1370	200	500
16.	Rasoolpur Rohta	1350	27200	250	3650	700	0
17.	Jani Khurd	1500	3900	300	3980	500	0
18.	Rajpura	500	4900	400	2600	570	300

SOURCE: STATISTICAL HAND BOOK, 1989
DISTRICT MEERUT

TABLE No. 20

AGRICULTURAL CROP PATTERN : MEERUT DESTRICT

(Subsidiary Crops)

Sl. No.	Name of the Block	Area in acres under		
		Potatoes	Vegetables	Gardens
1.	Binauli	120	834	150
2.	Sardhana	20	930	60
3.	Saroorpur	0	840	26
4.	Daurala	100	850	40
5.	Pilana	15	0	50
6.	Bhagpat	60	850	40
7.	Khekra	30	760	50
8.	Baraut	30	770	60
9.	Chhapraulí	0	800	60
10.	Khar Khauda	0	830	40
11.	Mawana	120	500	100
12.	Parikshit Garh	120	950	70
13.	Machhra	420	830	40
14.	Hastinapur	15	814	20
15.	Meerut	1400	2900	60
16.	Rasoolpur Rohta	0	780	40
17.	Jani Khurd	100	760	50
18.	Rajpura	200	668	40

SOURCE: STATISTICAL HAND BOOK, 1989
DISTRICT MEERUT

T A B L E - 21

Power Consumption in Meerut Division

(Consumption in Kwh.)

Sl. No.	Type of Consumption.	Meerut Division	
		Kwh.	%to total consumption.
1.	Domestic Consumption	75,82,196	2.03
2.	Commercial Lighing and allied domestic power.	6,84,849	0.18
3.	Industry.	2,94,01,269	7.76
4.	Street Lighing.	1,23,591	0.03
5.	Irrigation.	3,38,62,111	8.95
	Total	7,16,54,016	18.95

Source : Hydel Division, State Electricity Board, Meerut District.

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