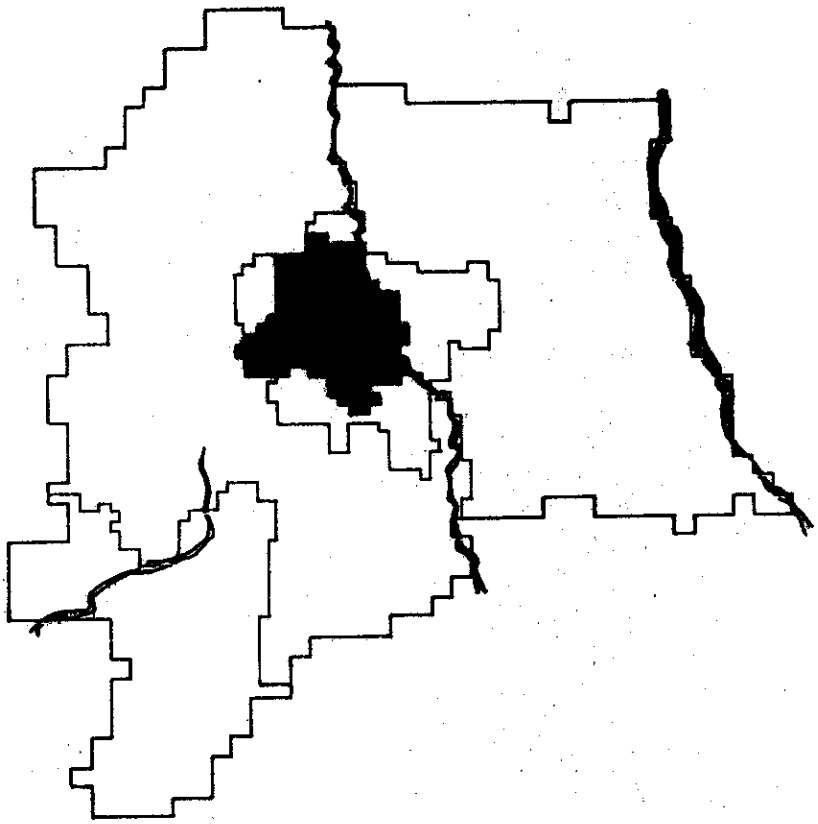
INTERIM DEVELOPMENT PLAN 2001
NATIONAL CAPITAL REGION



INTERIM DEVELOPMENT PLAN 2001
NATIONAL CAPITAL REGION

(Approved by the Board on August 29, 1986)

NATIONAL CAPITAL REGION PLANNING BOARD
Ministry of Urban Development
Government of India
February, 1987

Contents

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INTRODUCTION

The phenomenal growth of population of Delhi during the last decades has been causing a great concern to the Government of India. With the growing realisation of the need for containing the growth of Delhi within certain limit, it is clearly felt that the remedial measures are to be taken at the regional level particularly outside Delhi rather than within it. It is also, however, to be seen that while suggesting the measures to contain the population growth of Delhi, it does not adversely affect the overall quality of life in the city. At the same time, while suggesting a plan for the development of the Region, it is to be ensured that the actions taken to curb the population growth of Delhi are not counter-effective resulting in Delhi growing at a rate faster than before.

In fact, the draft Master Plan for Delhi prepared in 1959 and the final Plan approved by the Government of India in 1962 had recommended setting up of a statutory NCR Planning Board. Taking cognisance of this recommendation, the Government of India had set up a High Power Board in 1961 in the nature of an advisory body with the Union Minister of Home Affairs as its Chairman to coordinate the development of the Region. This Board was subsequently reconstituted in 1973 under the Chairmanship of Union Minister of Works and Housing with Chief Ministers of Haryana, Rajasthan and Uttar Pradesh and Lt. Governor of Delhi and other senior officials as members. The High Power Board was entrusted with the task of coordinating the development of urban and rural areas in the National Capital Region within the framework of a comprehensive regional plan to be formulated by the Board and in securing the collaboration of the concerned State Governments in the implementation of the regional plan. As the result of the deliberations in the meetings of the Board, the Town and Country Planning Organisation prepared a draft plan for the national Capital Region in 1973.

The basic aim and objective of the National Capital Region Plan was to keep within manageable limits the population and area of urban Delhi. It was, therefore, recommended that the population concentration should be purposefully diverted to the ring towns based on their growth potential. The intention of the Plan was to develop these ring towns as more or less self-contained units in matters of work places and residence. The Plan advocated decentralisation of certain economic activities away from the metropolis into different towns within the Region and also to promote balanced development in the Region. The National Capital Region Plan had, therefore, envisaged diversification of growth dispersed into different urban settlements to achieve this objective. Moreover, it stipulated curbs on further concentration of jobs in Delhi and suggested restriction on location of large industries in Delhi. It suggested decentralisation of selected government offices as well as some wholesale economic activities in self-contained 'ring towns', and restructuring of the regional transport network. The Plan envisaged integrated development of land in the Region with different facilities and services like drinking water, flood control, transport, power, housing and social amenities. To make a beginning, a 'seed capital' of Rs. 20 crores (also known as revolving fund) was proposed which was to have been utilised for the integrated urban development in priority towns. The Government of India was to fund this amount. The Plan had also made important recommendations about formulation of an urban land policy in the entire Region.

In order to channelise and regulate development and to carry out investment programmes, it was considered essential to have suitable ligislation which would control and regulate all such development in the areas falling in the Region. In fact, the High Power Board, in its meeting held on 6th December 1967, resolved that it was necessary to set up a statutory Board for the National Capital Region. However,

unfortunately, there was no consensus among the participant States for setting up a statutory Board with adequate legal powers to carry out the overall objectives and effectuate the proposals of the regional plan. The result was that no statutory Board could be set up and no regional enactment could take place for the proper development of the National Capital Region.

In 1980, it was decided that the NCR should be revitalised and the Region as a whole would have to be taken up for a coordinated development. The Minister of Works and Housing addressed letters on 12th May, 1981 to the Chief Ministers of the concerned States and the Lt. Governor of Delhi suggesting for their consideration the setting up of an effective authority with statutory powers to undertake the implementation of a time-bound programme of development. The matter assumed urgency because of the exercises taken up for the revision of Delhi Master Plan which projected a huge requirement of funds for providing different activities in case the present growth of the Capital was not controlled.

In order to take immediate decisions for accelerating and ensuring an orderly development of the Region, the Minister of Works and Housing convened two meetings with the concerned Chief Ministers and Lt. Governor of Delhi, one on 24th April, 1982 and the other on 30th August, 1982. It was decided to set up a statutory coordinating Board at the Central level for the planning, monitoring and development of National Capital Region at the regional level. An agreement was signed by the Union Minister of Works and Housing and Chief Ministers of Uttar Pradesh, Rajasthan and Haryana as well as the Lt. Governor of Delhi. For setting up the Board, it was agreed to introduce a Central legislation in Parliament by virtue of Article 249, 250 and 252 of the constitution on the basis of resolution to be passed by the legislatures of the States of Haryana, Rajasthan and Uttar Pradesh.

The National Capital Region Planning Board Act, 1985 (which replaced the Ordinance issued earlier in this regard) was passed by the Parliament in January, 1985 and received the assent of the President on 9th February, 1985. The NCR Planning Board, under the Chairmanship of the Union Minister of Works and Housing now called Urban Development has 21 members besides 5 coopted members. This composition is as under:

1. Union Minister of Urban Development — Chairman
2. Chief Minister of Haryana — Member
3. Chief Minister of Rajasthan — Member
4. Chief Minister of Uttar Pradesh — Member
5. Lt. Governor of Delhi — Member
6. Chief Executive Councillor Delhi Metropolitan Council — Member
7. Union Minister of Industry — Member
8. Union Minister of State for Railways — Member
9. Union Minister of State for Surface Transport — Member
10. Member (Urban Development), Planning Commission — Member
11. Secretary, Ministry of Urban Development — Member
12. Secretary, Department of Expenditure; Ministry of Finance — Member
13. Chief Planner, Town and Country Planning Organisation — Member
14. Minister of Town and Country Planning, Government of Haryana — Member
15. Minister of Urban Development Government of Rajasthan — Member
16. Minister of State in charge of Urban Development, Government of Uttar Pradesh — Member
17. Chief Secretary, Government of Haryana — Member
18. Chief Secretary, Government of Rajasthan — Member
19. Secretary, Housing and Urban Development, Government of Uttar Pradesh — Member
20. Chief Secretary, Delhi Administration — Member
21. Member Secretary, National Capital Region Planning Board — Member

Co-opted Members

1. Chief Minister of Madhya Pradesh
2. Secretary, Ministry of Industry, Government of India.
3. Chairman, Railway Board, Government of India.
4. Secretary, Ministry of Surface Transport, Government of India.
5. Adviser (HUD), Planning Commission, Government of India.

Under Section 7 of the Act, the functions of the Board are:

1. To prepare the Regional Plan and the Functional Plans;
2. To arrange for the preparation of sub-regional plans and project plans by each of the participating States and the Union Territory;
3. To coordinate the enforcement and implementation of the Regionl Plan, functional plans, sub-regional plans and project plans through the participating States and the Union Territory;
4. To ensure proper and systematic programming by the participating States and the Union Territory in regard to project formulation, determination of priorities in the National Capital Region or sub-regions and phasing of development of the National Capital Region in accordance with stages indicated in the regional plan;
5. To arrange for, and oversee, the financing of selected development projects in the National Capital Region through Central and State Plans. fund and other sources of revenue.

The Board is empowered to coordinate and monitor the implementation of the Regional Plan and to evolve a harmonised policy for control of land-use and development of infrastructure in the National Capital Region so as to avoid any haphazard development of the Region. The Act also provides for the setting up of a Planning Committee consisting of officers and town planners of the participating States and the Delhi UT to assist the Board in the discharge of its functions.

The Board will have its own fund called the National Capital Region Planning Board Fund consisting of contributions from the Central Government and State Governments concerned. The Board is also empowered to select and finance the development of any urban area outside the National Capital Region under the counter-magnet concept in order to achieve the objectives of the Regional Plan.

The statutory National Capital Region Planning Board is a coordinating and monitoring body and the responsibility of executing the schemes in the concerned States remains with the participating States and Delhi UT or their authorised agencies. This Board has the distinction of being the only institutional set-up of its kind in India with statutory responsibility for the planning and development of an inter-State region area around a Capital City.

After the Board came into existence, the Board, according to the provisions of the NCR Planning Board Act, 1985, in turn, constituted, a Committee called the Planning Committee for assisting the Board in the discharge of its functions. The Planning Committee has eighteen members under the Chairmanship of the Member-Secretary, NCR Planning Board.

The National Capital Region extends over an area of 30,242 sq. km in three States, namely, Haryana, Rajasthan and Uttar Pradesh and Union Territory of Delhi. The constituent units of each Sub-region are as follows:

a. Union Territory of Delhi (1,483 sq km).
b. Haryana Sub-region (13,413 sq. km) comprising Faridabad, Gurgaon, Rohtak and Sonepat; Rewari and Bawal tehsils of Mahendragarh district and Panipat tehsil of Karnal district.
c. Rajasthan Sub-region (4,493 sq km) comprising six tehsils of Alwar district, namely, Alwar, Ramgarh, Behroor, Mandawar, Kishangarh and Tijara.
d. Uttar Pradesh Sub-region (10,853 sq km) comprising three districts, namely, Meerut, Ghaziabad and Bulandshahr.

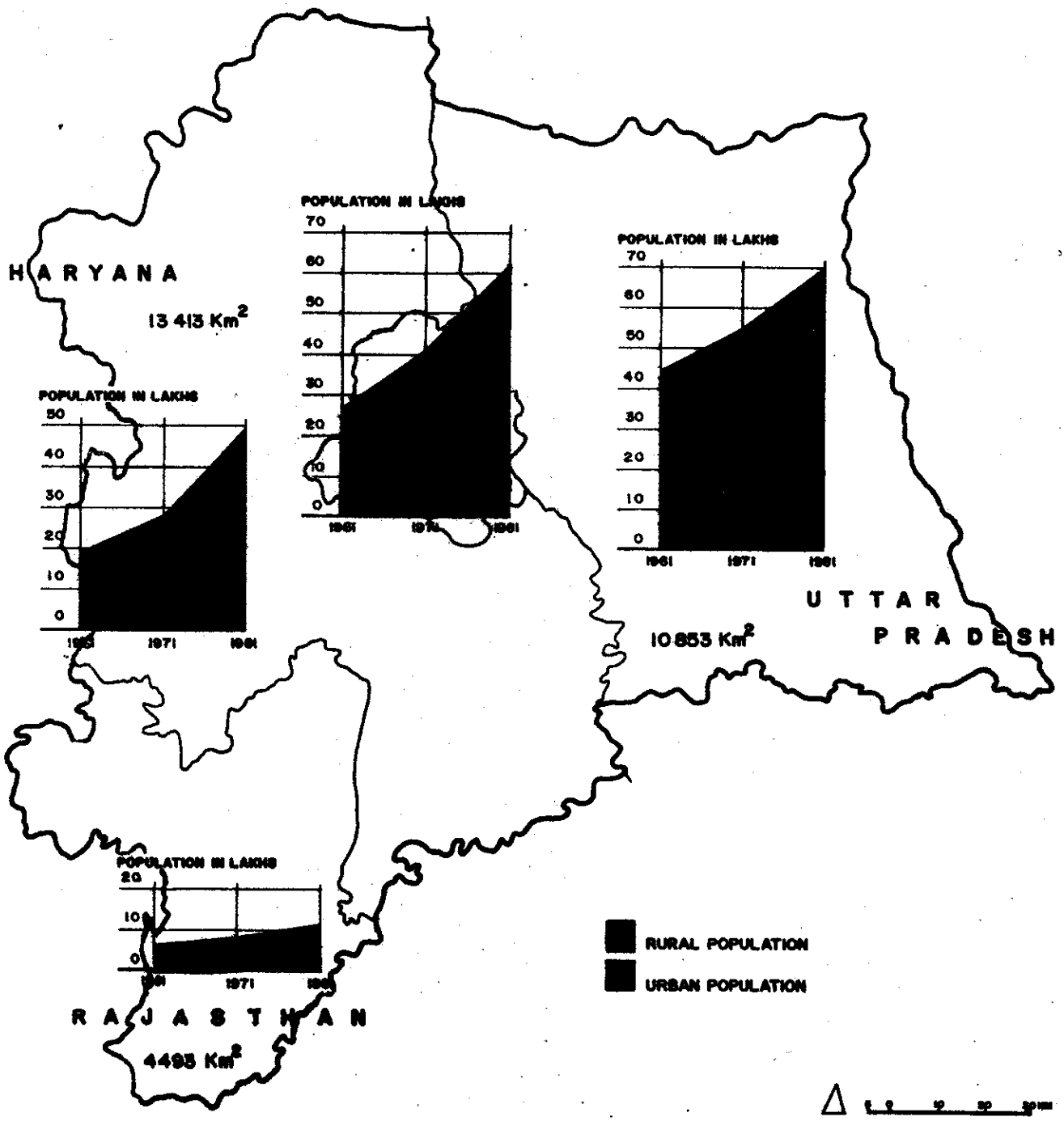
Figure 1 overleaf shows the constituent areas of the National Capital Region.

The Interim Development Plan is by and large a policy document. Part I of the report lists out the package of policy measures and proposals in respect of the different sectors of development in the form of a broad framework. Part II of the plan report deals in detail the various developmental and other aspects such as demography, settlement system, economic activities, transport and communications, civic services like water supply, sewerage and power, landuse and environment and ecology. This also includes a conservative estimate of the seed capital for implementing the plan proposals and programmes of all the sectors of development excluding power sector.

In connection with the preparation of the Interim Development Plan for NCR, 'Study Groups' comprising experts in the different aspects of development such as settlement pattern, transport and communications, water supply and sewerage, power and industries were constituted.

Through constant deliberations and interactions with the Study Groups, the Planning Wing of the Board drafted the Interim Development Plan (IDP), and after the consideration of the Plan by the Planning Committee, the I.D.P. for NCR was approved by the NCR Planning Board in its Fourth Meeting held on the 29th August, 1986. Composition of the Planning Committee and the Study Groups is appended to the report.

Figure 1: NCR by its Constituents



PART I

POLICIES AND PROPOSALS

1

The population growth of Delhi has been growing at a very high rate ever since it became the national capital. In comparison with the other cities of the country, Delhi is one among the three cities, the other two being Bangalore and Jaipur, which have been recording an average annual growth rate of more than 5% since 1951. Among the four metropolitan cities viz Bombay, Calcutta, Delhi and Madras, Delhi, in terms of population count, was at the bottom in the fourth place in the order in 1951, but, it has fast grown overtaking Madras with a comfortable lead to occupy the third position in 1961. Since then, it has been stabilising its trend of rapid growth. If this continues, in population size, Delhi will overtake both Calcutta and Bombay in the beginning of the Twenty First Century.

While there is a need for containing the growth of metropolitan cities in general, Delhi, being the national capital, needs a special attention in this regard. On the one hand, it is necessary to maintain – where it is satisfactory at present and improve – where it is necessary the amenities and environment of the city since it is an international city and it ought to demonstrate and reflect the image of the country. On the other hand, break down of any of the essential services will result in the break down of law and order which would have serious repercussions. Thus, the raison-d'etre of the Region is Delhi, and any planning of the Region has to emanate from Delhi outwards.

There is a felt need for containing the growth of population in Delhi. Thus, in suggesting a plan for the Region, measures have to be suggested which will curb the growth of population in Delhi. However, while suggesting these curbs, it has to be ensured that the overall quality of life in the city is not affected. In fact, the objective is to enhance it. Similarly, while suggesting a plan for development of the Region, it has, at the same time, to be ensured that the measures suggested do not result in the Region and the core area – Delhi, both growing at a faster rate than they have experienced in the past. Thus, the policies that have been suggested have taken into consideration all these aspects and, while keeping the growth of population in the Region as a whole to remain as projected by the various experts, a re-distribution has been suggested so as to take the pressure off Delhi and provide for a planned and viable growth of the Region.

1.1 Perspective

The Interim Development Plan (IDP) has been prepared with 2001 as the perspective. Even though with the fixing of 2001 A D as the horizon, the period of the plan gets reduced to 15 years or less, it has been felt necessary to stick to 2001 primarily on account of the fact that the Master Plan for Delhi is being prepared with the year 2001 as the perspective. It would, however, be worth considering whether it will be feasible to have a longer perspective for the comprehensive plan.

1.2 Objective

With the regional population remaining at the projected 325 lakhs of which 234 lakhs will be urban and 91 lakhs rural by the year 2001, the main objective of the regional plan is to restrict the share of Delhi Sub-region to 112 lakhs as against the projected 132 lakhs (or 148.5 lakhs as projected by the Perspective Planning Wing of the Delhi Development Authority). While restricting the growth of Delhi, it is necessary to ensure that the difference in the growth is contained within the Region in a planned manner. It is also necessary that the resultant extra growth in the Region outside Delhi is of such a nature that it will have an overall effect in the entire Region stimulating its regulated and orderly growth in and around the poles selected for development.

Mere restriction of population by itself will not be sufficient to improve the quality of life in Delhi. It is necessary that the green areas are preserved and the environment is kept conducive to a healthy growth. It has, therefore, been felt necessary that in addition to restricting the population of Delhi, it would also be necessary to contain the growth of urbanisation in the immediate environs of Delhi, and hence certain restrictions are proposed for the area which is termed as the Delhi Metropolitan Area. Again, while containing the future growth of this area, it is necessary that the existing situation is improved so that better integration with the core area is brought about, which, therefore, without being a point of attraction for the people from outside, will become so attractive such that shifting of population from the core area to these places is voluntary.

If the growth of Delhi is to be restrained while keeping the regional growth as projected, it is necessary for induced development of some areas of the Region. Various alternative strategies were discussed and it was decided that considering the financial, administrative, managerial and other constraints, it would be advisable to restrict the induced growth to a small number of towns which have exhibited strong characteristics of growth in the past and which, given the necessary inputs, have the potential to absorb the increase in population. Accordingly, Meerut, Hapur, Balandshahr-Khurja, Palwal, Rewari-Bhiwadi-Dharuhera, Rohtak, Panipat and Alwar have been identified to absorb the increase in population. In the past, the development of towns to stimulate induced growth of population has been synonymous with schemes of land acquisition and development. There had been a facile assumption that if serviced land requirements for the additional population are met, the towns would automatically grow. This assumption has been proved to be incorrect and, considering that the growth of cities is more on account of job seeking inmigrants rather than an employed person seeking a house or serviced land, it is necessary to provide an economic base for the growth of the towns. Similarly, in trying to curb the the growth of population in Delhi, the economic factors which govern such growth have to be carefully identified and steps suggested so as to contain this growth. The success of the entire proposals contained in the IDP will depend on the economic measures rather than the other measures suggested. The other measures suggested are only to support, strengthen or to take care of the requirements of such economic growth.

The phenomenal growth of industries and the growth of public sector offices, especially in the decade 1971-81, apart from the growth of government offices, have been identified as the most important exployment generating activities in Delhi. To curb the unwanted growth in these sectors, locational policies have been proposed.

The other important economic activity which has also exhibited strong elements of centralisation in Delhi is the whole-sale and distributive trade. In the case of these trades, the large differential in the local-tax structure favouring Delhi has been identified as one of the most important factors for such concentration. Unless steps are taken to bring about some uniformity in the tax structure of the NCR, all efforts to woo or wean whole-sale and distributive trades away will not bear any result. Accordingly, certain policy proposals in the local taxation sector have been suggested.

Transport is essentially looked upon as a service. However, it has also its economic by-products. Sound transport policy will not only service the population but also prove to be a catalyst for growth of the identified areas and will channelise the direction of growth. The main objective of the transport plan for the Region is to provide good connections to the central core area while discouraging the transit of goods and passengers through the core area by providing alternative routes that will bypass the core area. The bypass will open up economic opportunites for the development of these areas.

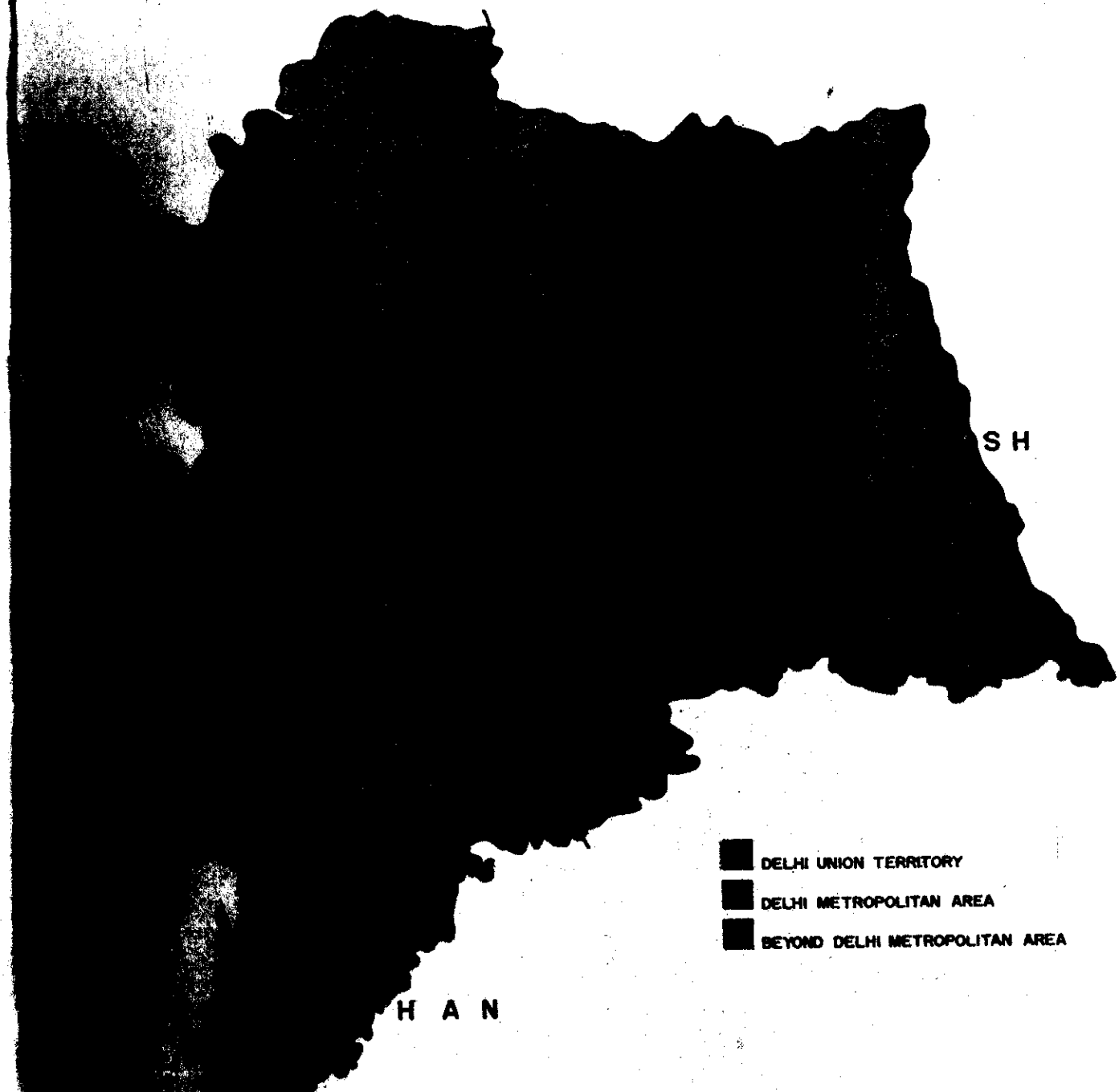
For the proper development of the Region, it is necessary to ensure the availability of the urban infrastructure of a quality and standard not very much inferior or different from that obtaining in Delhi. Accordingly, policies have been suggested for the provision of physical infrastructure and also for the development of power. The policies are, by and large for three distinct zones (Figure 2 shown on page no. 3) viz Delhi U T, Delhi Metropolitan Area and area beyond Delhi Metropolitan Area within the NCR.

With the aforesaid objectives and suggested strategies in view, a package of policy directives for various developmental aspects to be adopted are enumerated in the following pages.

A Population Policy

P.P.1 To control the growth of population of Delhi to 112 lakhs by the year 2001.

Fig-2. POLICY ZONES



the growth of population in the
Metropolitan Area (DMA) so as to
an size to a total of 37 lakhs by
individual towns having the
accommodate the following

Ghaziabad including Loni	11	lakhs
NOIDA	5.5	lakhs
Faridabad	10	lakhs
Gurgaon	7	lakhs
Bahadurgarh	2	lakhs
Kundli	1.5	lakhs
Total	37	lakhs

In DMA, the rural population would be one lakh.

P.P.3 The Region is to be planned for a total population of 325 lakhs with an urban component of 234 lakhs.

B Settlement Pattern

S.P.1 to counter-act the pull factors exerted by Delhi and also to absorb the difference between the projected growth and the assigned population of both Delhi and the Delhi Metropolitan Area, the following towns in the Region are to be developed on priority basis to accommodate the population noted against each:

Meerut	13 lakhs
Hapur	6 lakhs
Bulandshahr-Khurja	10 lakhs
Palwal	3 lakhs
Alwar	5 lakhs
Rewari-Bhiwadi-Dharuhera	3 lakhs
Rohtak	5 lakhs
Panipat	5 lakhs
Total	50 lakhs

For a judicious distribution of the population, a four tier system of settlements has to be evolved to include regional centres, sub-regional centres, service centres and basic villages. The functional character of these centres are to be identified in terms of the available infrastructural and social services. The remaining 37 lakhs of urban population and 91 lakhs rural population will be accommodated in a hierarchical pattern of settlements consisting of intermediate towns, growth centres and villages.

C Policy Regarding Economic Activities

Both in order to curb the growth of population in Delhi and to induce growth of population in selected towns, the following three major employment generators have been identified for dispersal:

i. Industries
ii. Central Government and Public Sector Offices
iii. Wholesale and Distributive Trades and Commerce

E.P.1 Locational Policy for Industries

a. Strict control within the Union Territory of Delhi

i. While continuing the present policy of not promoting location of medium and large scale industries within Delhi, location of even small scale industries is to be restricted to those which employ 20 or less persons and, are required either for providing or servicing the consumer needs of Delhi's population. All applications should be referred to a Special Group constituted by the Board for checking such industries.

ii. All non-conforming industries which have been identified in the revised Delhi Master Plan should be shifted outside Delhi. A Committee should be set up for selecting an alternative site for shifting these industries within the Region.

b. Control outside Delhi but within the DMA

No large scale or medium scale industries should be permitted to be set up in the DMA. Only small scale units should be permitted.

c. Incentive for industries outside the DMA but within the National Capital Region

The towns selected for priority development should bave a strong industrial content, and incentives should be given for location of large, medium and small scale industries by developing industrial estates in these towns. In addition to these towns, there should be no restrictions on the growth of industries in the Region except in the areas reserved for conservation.

E.P.2 Locational Policy for Central Government and Public Sector Offices

a. Strict control within the Union Territory of Delhi

With regard to Government offices, the present policy and mechanism for screening the location of new government offices and expansion of existing government offices should be continued. The main criterion for location of offices in the Capital should be that they perform the ministerial functions, protocol functions or liaison functions which by their nature, cannot be performed anywhere else except in the national capital. The existing offices which do not perform any of the above functions should be shifted from Delhi. The jurisdiction of the Committee, which already exists in the Government of India for scrutinising and screening the opening of new government offices and expansion of government offices in Delhi should be enlarged to include the public sector offices. The Committee should further

identify those public sector offices or parts of their offices whose location in Delhi is not justified on the basis of the aforesaid three criteria.

b. Control outside Delhi but within DMA

i. A similar control on the opening of new central government and public sector offices in the DMA towns should be exercised. Relocation or expansion of government offices which have ministerial, protocol or liaison functions which make it incumbent upon them to be located in Delhi should be encouraged to be only in the DMA towns.

ii. In so far as public sector undertakings are concerned, the restrictions on their opening new offices or expanding the existing ones should apply equally to the DMA also. Relocation of those offices whose existence or continuance in Delhi is justified may be encouraged to be in DMA.

E.P.3 Location Policy for Whole-sale and Distributive Trade and Commerce

i. Disincentives within Delhi

An approach of disincentives to the whole-sale trades which are not directly consumed in Delhi should be adopted. Only those whole-sale trades, at least 60% of which are directly used and consumed in Delhi and, are not hazardous in nature and do not require extensive space, should be allowed to continue and develop in Delhi.

ii. Controlled development outside Delhi but within DMA

The policy of checks and disincentives is also to be followed in case of DMA towns but with some exceptions. Only those whole-sale trades which are mainly used and consumed in Delhi and DMA towns should be allowed. In Delhi, there are certain whole-sale trades such as plastic and PVC goods, chemicals, timber, foodgrains, iron and steel and other building materials which are hazardous because of their location in congested areas and also due to bulk handling activities. These whole-sale trades should be encouraged to develop in DMA towns.

iii. Outside DMA but within NCR

It is proposed that, as a matter of policy, incentives, concessions and infrastructure should be made available in the regional towns to encourage and accelerate the growth of trades. New trade functions with high growth potential should be identified and located outside Delhi and DMA to cater to the specified roles assigned to the selected towns.

E.P.4 Fiscal Policy

F.P.1 In order to achieve uniformity to some extent in tax structure in the National Capital Region, Delhi Union Territory should have minimum floor-level of taxation.

F.P.2 The tax structure of the Union Territory of Delhi should be so adjusted that the tax on industrial raw materials and industrial machinery should be slightly higher than that in the rest of the Region.

F.P.3 In order to prevent diversion of trade from the neighbouring States to Delhi, the present rate of taxation of 2% levied on re-export of goods should be raised to 4% as is being levied in the three participant States of Haryana, Uttar Pradesh and Rajasthan.

F.P.4 It is felt that non-levy of consignment tax is resulting in diversion of trade from other states to Delhi. It is, therefore, considered necessary that the Government of India take immediate steps as follow up action with regard to the 46th Constitutional Amendment Act 1982 as per the recommendations of the Group of Chief Ministers' Conference.

D Policy Regarding Land Use

Policy for Agricultural land

Agriculture forms an important part of the economy of the NCR. Roughly, 80% of the total area of the Region is used for agriculture and its allied activities and, more than 50% of the total workers are engaged in primary sector activity. Therefore, it is imperative to evolve policies for agricultural development.

L.P.1 The new employment opportunities are proposed in the non-agricultural sector and consequent concentration of population in the selected priority settlements would need more area and this expansion would have to be met mostly from the existing agricultural land. This necessitates the need for a rational policy of utilisation of less valuable land for urban expansion and, as far as possible, unproductive or barren land for location of urban/industrial centres.

L.P.2 The reduction of agricultural land may be caused by the creation of lakes, reservoirs, flood protection works, urban water supply schemes and

irrigation works. This also calls for an intensive utilisation of available agricultural land for production purposes.

L.P.3 Intensive food production units which are subject to planning control will be permitted in the urban and rural areas where they conform to the policies for conservation or environmental protection. The improvement for reclamation of land for agricultural use will normally be permitted where this would not seriously conflict with landscape, archeological or nature conservation policies. Development will not normally be permitted where it would result in permanent loss of forest land.

L.P.4 The land reclaimed by flood protection has to be reserved for agriculture.

Policy for Forest Development

L.P.5 The policy for development of forests should aim at preservation, improvement of existing forest areas in Alwar tehsil and along the Ganga river in Uttar Pradesh Sub-region.

L.P.6 Tree plantation should be carried out on cultivable waste and barren lands and public lands.

L.P.7 In each settlement, tree plantation programme like social forestry should be speeded up for the amelioration of local, physical and economic condition and for production of fuel wood for local consumption.

L.P.8 Restriction should be imposed on conversion of forest lands for agricultural purposes.

L.P.9 Policy for land for Urban Development

The projected urban population of 234 lakhs by 2001 in the Region means an addition of 143 lakhs to the urban population of 91 lakhs as of 1981. To accommodate this additional population, nearly 2.8 lakh hectares of land would be required on the basis of prevailing overall average density of population in the towns of the Region. However, it is necessary to conserve agricultural and other lands and minimise the area of land coming under urban use. If properly planned, most of the existing towns, especially the DMA towns and priority towns, can accommodate the additional population by re-densification reducing thus the need for additional land. It has been estimated that out of the 110 lakh urbanites by 2001 A D, as much as 82 lakhs could be accommodated by modification of densities within DUA-81 urbanisable limits[1], and the remaining 28 lakh population lakhs population could be accommodated in 17000 hectares of land in urban extension. This would mean that the additional urban population of 53 lakhs between 1981 and 2001 would need an additional land area of only 17000 hectares.

In DMA towns, the additional 28.32 lakh persons can be accommodated in 10,000 hectares of land. In the 8 towns and complexes selected for priority development, a land area of the order of 20,000 hectares could be sufficient for 36 lakhs additional population. Thus, it would be seen that for accommodating nearly 120 lakh persons, a total additional area of 47,000 hectares may be adequate. The State Governments will prepare Master Plans for the towns keeping in view the policies indicated.

Policy for Regional Recreational Areas

L.P.10 Areas with general level amenities as regional parks in the proximity of the metropolis could be developed.

L.P.11 River front as recreational areas by developing them and making them more accessible for such use.

L.P.12 Historical monument, natural and areas of scenic beauty, both existing and potential, and forest land, should be preserved.

L.P.13 Parks in rural areas noted for their landscape and scenic beauty which could be used as picnic spots.

L.P.14 National Parks/Wild Life/Bird sanctuary in the vicinity of the Region could be developed for tourist attraction.

Policy for Nature Conservation

L.P.15 To achieve the overall development of the NCR without destruction to its natural environment, all economic activities need to be well planned. Special attention should be given to check the damage to the environment by man's interference for development purposes.

L.P.16 Development which is likely to affect adversely sites of special scenic beauty or national or local nature reserves will not be permitted.

L.P.17 Full account will be taken of feature of importance with regard to nature conservation when considering major development proposals.

L.P.18 Special attention will also be given to protection of special landscape areas and areas sensitive to development pressures.

1 *Master Plan for Delhi-2001 by Delhi Development Authority.*

Policy for Green Buffer

L.P.19 The NCR Plan aims to improve the physical environment of the whole Region. This would be achieved by ensuring both existing uses within the Region and the development which are contemplated by the proposals. The green buffer will support the promotion of the priority settlement/areas by controlling the growth of their built up areas. Besides, the green buffer will prevent neighbouring settlements from merging with each other and help to preserve their special character. The detailed demarcation of the buffer zone is indicated in L.P.25.

L.P.20 The character of the buffer zone will be retained, protected and enhanced wherever possible by safe-guarding areas of mainly open rural areas to take account of the interest and needs of agriculture and provide a source of recreation.

L.P.21 The green buffer zone policies are designed to restrain the encroachment of urban activities into the open rural areas. The buffer zone could be used for the purposes of agriculture, horticulture, forestry and other uses appropriate to the character and function of the buffer zone.

L.P.22 The establishment of outdoor sport, recreation or leisure facilities to meet the needs of community could de directed to the suitable parts of buffer zone.

P.23 Mining activites and brick kilns could be itted in the buffer zone, subject to their con- to the restrictions to be imposed in the of minimum distances from roads, schools, aces and habitation etc., and further to strict heric pollution restrictions.

The ride which extends as a spur from upto alwar and beyond and the forest cent to it need to be preserved carefully. ation proposals are to be entertained in in this ridge.

Buffer Zones

The following are the proposed locations Zones. However, detailed demarcation nes will be shown in the landuse plan. zone of suitable width surrounding which will prevent DMA towns from with DUA.

area between the urban areas of Ghazia- and Loni.

ch along the NH-2 between Farida- bhgarh Complex and Palwal.

iv. The area between Ghaziabad, Muradnagar, Modinagar and Meerut.
v. The area around Bulandshahr and Khurja Urban Complex.
vi. The areas around Rewari-Dharuhera and Dharuhera-Dhiwadi of proposed Rewari-Bhiwadi Urban Complex.

E Transport and Telecommunication Policies

The Regional Transport strategy for the National Capital Region should promote and support the economic development of the Region and relieve the Capital of traffic congestion. As such, it requires:

i. to inter-connect among each other the regional urban centres lying in the outer areas of National Capital Region
ii. to connect them with the Capital by fast mode to transport which would require better road and rail connections.
iii. to integrate road and rail services in the intra-urban area of Delhi and also in DMA.
iv. to develop new loading and un-loading facilities outside Delhi Union Territory for goods coming from outside the Region for distribution in Haryana and Uttar Pradesh so as to avoid un-wanted load of goods traffic on the roads of Delhi Urban Area.

Regional Transport Policy

Roads

T.P.1 Development of the stretches of NH-1 (Delhi-Panipat), NH-2 (Delhi-Palwal), NH-10 (Delhi-Rohtak), NH-8 (Delhi-Gurgaon), NH-24 (Delhi-Hapur) and existing State Highway between Ghaziabad-Meerut to four lane divided carriage way to be known as M-I Motorway with acquisition of right of way of 100 metres, within NCR including development of service roads in the built up area.

T.P.2 Development of an inner and outer grid system of roads of the order of M-II Motorway with certain common stetches which would be of two lane carriage way initially with acquisition of full right of way of 60 metres within Seventh and Eighth Plan period and to four lane carriage way finally by 2001 A.D. The inner grid is to follow the alignment of Sonepat –Bagpat –Meerut–Hapur–Balandshahr – Sikandrabad – Faridabad – Rohtak – Gurgaon – Jhajjar – Gohana – Sonepat. The outer grid would connect Panipat– Hapur– Muzaffarnagar– Meerut

– Bulandshahr – Khurja – Palwal – Rewari – Jhajjar – Gohana – Rohtak – Panipat.

T.P.3 Development of M-II Motorway between Rewari and Alwar which would be of two lane carriage way initially with acquisition of full right of way of 60 metres for an ultimate four lane carriage way when traffic requirements justify.

T.P.4 In consonance with the policy of developing a four tier system of settlements, road structure in the Region would be evolved. Efforts would be to inter-connect the same order centres directly and the lower order centres to their nearest higher order centres. A system of feeder roads of higher standard would be evolved to connect the work centres/ industrial estates with the nearest regional or sub-regional settlements.

Rail

T.P.5 Development of regional rail bypass

This would pass through Meerut – Hapur – Bulandshahr – Khurja – Palwal – Sohna – Rewari – Jhajjar – Rohtak.

T.P.6 Conversion from existing low capacity Metre – Gauge railway system into high capacity system between Delhi – Alwar to be taken up.

T.P.7 Identification and location decision on another rail terminal to decongest and solve the traffic problems faced by the existing terminals.

T.P.8 Completion of electrification along the radial corridors, viz., Delhi – Panipat, Delhi – Meerut beyond Ghaziabad, Delhi – Rohtak beyond Shakurbasti.

	Stretch	Details of work
a)	Delhi-Panipat(88 km)	i Electrification and raising of platforms, FOB etc. ii Automatic colour lighting, signalling on Subzimandi, Sonepat, Panipat iii Terminal facilities at Panipat including information system, etc. iv Staff quarters
b)	Delhi-Meerut beyond Ghaziabad	Doubling from Muradnagar to Meerut and electrification and raising of platforms, FOBs and signalling installation etc.
c	Delhi-rohtak beyond Shakurbasti	Electrification, raising platforms, FOBs, including signalling installation.

T.P.9 Operation of EMU services on the corridors of T.P.8 at the desired frequency.

T.P.10 Operation of EMU services on the ring with required frequency, initially with a lead time of 25 minutes in peak period/direction alongwith extension of EMU services on three selected corridors (radially) viz., (i) Delhi – Ghaziabad, (ii) New Delhi – Shakurbasti which are already electrified, replacing all the shuttle services to Shakurbasti, Ghaziabad and Palwal.

T.P.11 Development of infrastructural inputs required for the operation of EMU services in selected corridors. This would involve some additional stations to be opened and certain other inputs besides raising of platforms to suit EMU coach operation. The corridors and actions needed in respective corridors are:

	Corridor	Station to be opened	Inputs required
1.	A. Delhi-Shadara-Ghaziabad	Gandhinagar Shyamlal College	Creation of new halt station and removal of the infringements to suit EMU
	i) Stations inside Delhi UT	Gaiani border	
	ii) Stations outside Delhi UT	Mohan Nagar	
	B. New Delhi-Ghaziabad	Shakurpur BEL	Creation of crossing and halt stations
2.	New Delhi-Palwal	Junction Cabin	Creation of halt stations
3.	New Delhi-Shakurbasti	Rampura Cabin	Creation of halt station
4.	Accesibility facilities of Eight stations		
5.	Lengthening of platforms for 25 Bogies at Delhi and New Delhi stations.		
6.	Provision of independent double line between Delhi-New Delhi-Kishanganj-Delhi and Subzi Mandi.		
7.	Doubling and electrification of Dayabasti-Azadpur section.		
8.	A. Two more lines between Ghaziabad and Maripet Car Shed.		
	B. One more additional line (4th line) between Sahibabad and Ghaziabad		
9.	Extension of 4th line from junction cabin to Palwal		
10.	A. Automatic signalling between Tughlakabad and Palwal		
	B. Staff quarters and office building		

T.P.12 Evaluation of introduction of new rapid high capacity mass transport system such as Light Rail Transit (LRT) etc. Re-organisation of Delhi Transport Corporation's fleet services to provide feeder service to EMU service as well as any other high capacity mass transport system conceived for smooth intra-urban travel and improve the efficiency of ring and radial rail service.

T.P.13 Feasibility evaluation/Techno-economic studies for the development of existing/new corridors and extension of existing corridors in the lines

Ghaziabad-Khurja	For EMU services
Ghaziabad-Hapur	For electrication and EMU services
Dayabasti-Azadpur	New electrified line and EMU services

T.P.14 To enable the ring rail to play a meaningful role in serving inter-city and intra-urban commuters, it is necessary to increase the frequency in the in stages to reach the ultimate desired frequency for the envisaged population and, to extend same to Ghaziabad on the east, Plawal on the , Indira Gandhi Airport and Rohtak on the west and west respectively, and towards Panithe north.

.15 Development of new integrated metroterminals specially to serve the outer areas of T of Delhi and Delhi Metropolitan Area in the of (a) Trans-Yamuna, (b) Okhla, (c) Bharthal and orth Delhi. Locational and other techno-economic studies for these terminals may be taken up diately.

.P.16 While financing any development, the wing main criteria would be taken into consideon besides the cost component:

The needs of priority areas and new developent and extension areas.

e extent to which such proposals would aid objective of decongesting Delhi and would p in taking away – to or generating activities – the outer areas of the Region.

efits of such proposals would accrue for the ing industrial and commercial activities for xpansion and employment generation.

In selecting locations for new loading and facility centres, priority and preference or locations that have greater potential/ drain and diverge out maximum traffic.

With the identification of priority towns ced population which is primarily aimed ned through development activities, it is probe into the possibilities of extendvices to these towns through short dis-

rmation of a single Unified Metropoli- Authority which may, besides other ulate and gain actions regarding fare ifferent modes, their gradation and

ecommunication Facilities in the

foremost need for the Region is an adequate and effective telecommunication network which would provide impetus to the dispersal and development of economic activities away from Delhi to out-lying areas. The NCR Interim Plan advocates a three tier system for the development of economic activities in the Region as a broad policy, and has also recommended development of eight towns and complexes in the Region on priority basis. Provision of reliable and adequate telecommunication facilities in the Delhi Metropolitan Area and in these selected towns as input has been considered necessary for preparing a realistic plan.

The following objectives are necessary for provision of telecommunication facilities in the selected towns and the towns falling in Delhi Metropolitan Area.

- Full automatisation of telephone services
- Replacement of all life expired exchanges and other equipments
- Provision of telephone and telex connection practically on demand
- Provision of subscribers dialling facilities between Delhi and the priority towns and Delhi Metropolitan Area towns
- Connection of priority towns and DMA towns with Delhi by reliable cable and radio media
- Provision of reliable trunk services either by direct dialling facilites or through demand service among the priority towns and DMA towns
- Provision of telegraph offices as justified

An integrated telecommunication system adopted on these lines, in a way, is also likely to supplement the transportation network in the Region thereby reducing the pressure on the transportation arteries proposed in the Plan.

F Policy for Physical Infrastructure (Power, Water Supply, Sewerage and Sanitation)

I.P.1 Integrated Master Plans for providing water supply, power, sewerage and storm water drainage facilities in the DMA towns and selected towns should be prepared both for the existing areas proposed for development so as to offset the existing deficiencies as also to meet the estimated demands from these towns.

I.P.2 The power supply should be un-interrupted and available in adequate quantity throughout the Region. Without a satisfactory power supply throughout the Region, the basic objective of National Capital Region Plan cannot be achieved.

I.P.3 All the 'under-construction' schemes falling

the Region, especially the Narora atomic plant, need to be given top priority and completed in time.

I.P.4 At present, the electricity tariff is not uniform throughout the Region. It may not be possible to have complete uniformity in tariff rates throughout the Region. However, electricity rates for industrial and commercial uses in the Region need to be revised in such a way that Delhi becomes a 'less-preferred' area for industrial activities.

I.P.5 The participant States of NCR (Haryana, Rajasthan and Uttar Pradesh) have demanded a sum of Rs. 684 crores to improve the level of power supply in their sub-regions. This includes a sum of Rs. 420 crores for generation. With regard to laying of transmission and distribution lines and construction of sub-stations, it is suggested that in the Seventh Plan, only those lines and sub-stations should be taken up which are required to improve the level of power supply in 'priority towns'. In order to ensure that these towns get a satisfactory power supply, power should be supplied to these towns on preferential basis.

I.P.6 As far as domestic supply is concerned, a 24 hour supply should be ensured in urban as well as rural areas. All the villages falling in the Region should be electrified on priority basis.

I.P.7 The supply of drinking water of the required norm and standard should be made available to the priority towns in the first stage and to all the towns and rural settlements in the second phase.

I.P.8 To meet the additional requirement of water supply of 10,025 lakh litres per day for the priority towns, existing sources of water supply have to be developed and efficiently distributed on a unified basis.

I.P.9 The development of most of the water supply sources would require inter-state cooperation and, problems of water supply should be dealt in a unified manner for the NCR as a whole. A survey to assess the ground water yield would be undertaken in the priority towns. It would be necessary to plan, design and implement and maintain all water supply schemes in an integrated manner for NCR.

I.P.10 Detailed Plan for sewerage scheme, solid waste management and sanitation should be prepared and adequate funds should be arranged for implementation of schemes.

I.P.11 Settlements where a sewerage system is not available, low cost sanitation system for individual families should be adopted as a short term measure.

I.P.12 Strict enforcement of Water Pollution Control Act of 1974 is an immediate must. Complete treatment of waste water before discharging it into the rivers is essential for controlling pollution and maintaining better environment.

PART II
DEMOGRAPHIC PROFILE

2

2.1 Urban Population Growth

One-fourth of the population of India lives in urban areas. The urban population has increased more than two and a half times over the last three decades ending 1981 registering an increase of 6 percent-points from 17.3 percent in 1951 to 23.3 percent in 1981. Since the beginning of the century, the highest growth rate of urban population has been during the decade 1971-81 (Table 2.1).

Table 2.1 Growth of Urban Population in India 1901-81

Census year	Total Urban population in millions	Percentage of urban population to total population	Percentage growth of urban population during the decade ending
	25.8	10.8	–
	25.9	10.3	0.3
	28.1	11.2	8.3
	33.5	12.0	19.1
	44.2	13.8	32.0
	62.4	17.3	41.4
	78.9	18.0	26.4
	101.1	19.9	38.2
	159.7*	23.3	46.4

1, Census of India 1971: General Population Tables-Part IIA(i), India
2. Census of India 1981: General Population Tables, Part IIA(i), India
* Includes projected population of Assam for 1981

1911, the growth rate of urban population been higher than that of the total popula- lining the analysis to the period since the of the planning era in 1951, it is observed the growth rates of urban population and ation has been the widest during the dec- (Table 2.2).

Table 2.2 Growth of Population in India 1951-81

Year	Total Population in millions	Decadal growth rate (%)	Urban population in millions	Decadal growth rate (%)
1951	361.09	–	62.44	–
1961	439.24	21.5	78.94	26.42
1971	548.16	24.8	109.11	38.22
1981	685.18*	25.0	159.73	46.39

* Includes projected population of Assam for 1981

The urban population of 1981 census is distributed over 4029 urban settlements. However, the twelve metropolitan cities namely, Calcutta, Bombay, Delhi, Madras, Hyderabad, Pune, Ahmedabad, Bangalore, Kanpur, Nagpur, Jaipur and Lucknow alone account for more than one-fourth of the total urban population, and over 6% of the total population of India. The four super metropolitan cities – Calcutta, Delhi, Bombay and Madras taken together contain about one-sixth (17.2%) of the urban population and 4% of the total population of India (Table 2.3 on page 12).

Among the twelve metropolitan cities, Calcutta and Bombay account each for more than 5% of the total urban population of India. Calcutta and Bomaby account each for more than 1% of the total population of India.

There has been a greater concentration of urban population in bigger urban centres. The seven metropolitan cities, namely, Calcutta, Bombay, Delhi, Madras, Hyderabad, Ahmedabad and Bangalore account for more than 20% of the urban population of the respective States. Calcutta accounts for about 64% of the total urban population of West Bengal and Delhi accommodates 99% of the urban population of Union Territory of Delhi. As regards proportion of city's population to total population of the respective States, Calcutta,

Bombay and Delhi accommodate more than 10% of the population of the respective States with Delhi accommodating the highest of 92% followed by Calcutta with 17%, Bombay with 13% and Madras with 9%.

Among the twelve metropolitan cities, Delhi has always been growing at a faster rate of more than 50% since the beginning of the planning era. (Table 2.4 and Figure 3). Though Calcutta and Bombay rank higher than Delhi in terms of population (1981), their growth rates have always been notably much lesser than that of Delhi.

If Delhi continues to grow at the present rate, it will overtake even Bombay and Calcutta soon. Among the four major metropolises of Calcutta, Bombay, Delhi and Madras, not only the growth rate

Table 2.3 Population of Metropolitan Cities–1981

Metropolis	Population (1981)	Percentage to urban population of the respective State	Percentage to urban population of India	Percentage to total population	Percentage to population of India of the respective State
Calcutta UA	9194018	63.60	5.75	16.84	1.34
Gr. Bombay UA	8243405	37.47	5.16	13.12	1.20
Delhi UA	5729283	99.31	3.59	92.12	0.84
Madras UA	4289347	26.90	2.69	8.86	0.63
Hyderabad UA	2545836	20.34	1.59	4.74	0.37
Ahmedabad UA	2548057	24.06	1.60	7.48	0.37
Bangalore UA	2921751	27.21	1.83	7.86	0.43
Kanpur UA	1639064	8.24	1.03	1.48	0.24
Pune UA	1686109	7.68	1.06	2.69	0.25
Nagpur UA	1302066	5.91	0.81	2.07	0.19
Jaipur UA	1015160	14.01	0.63	2.95	0.15
Lucknow UA	1007604	5.07	0.63	0.91	0.15
Total	**42121700**		**26.36**		**6.15**

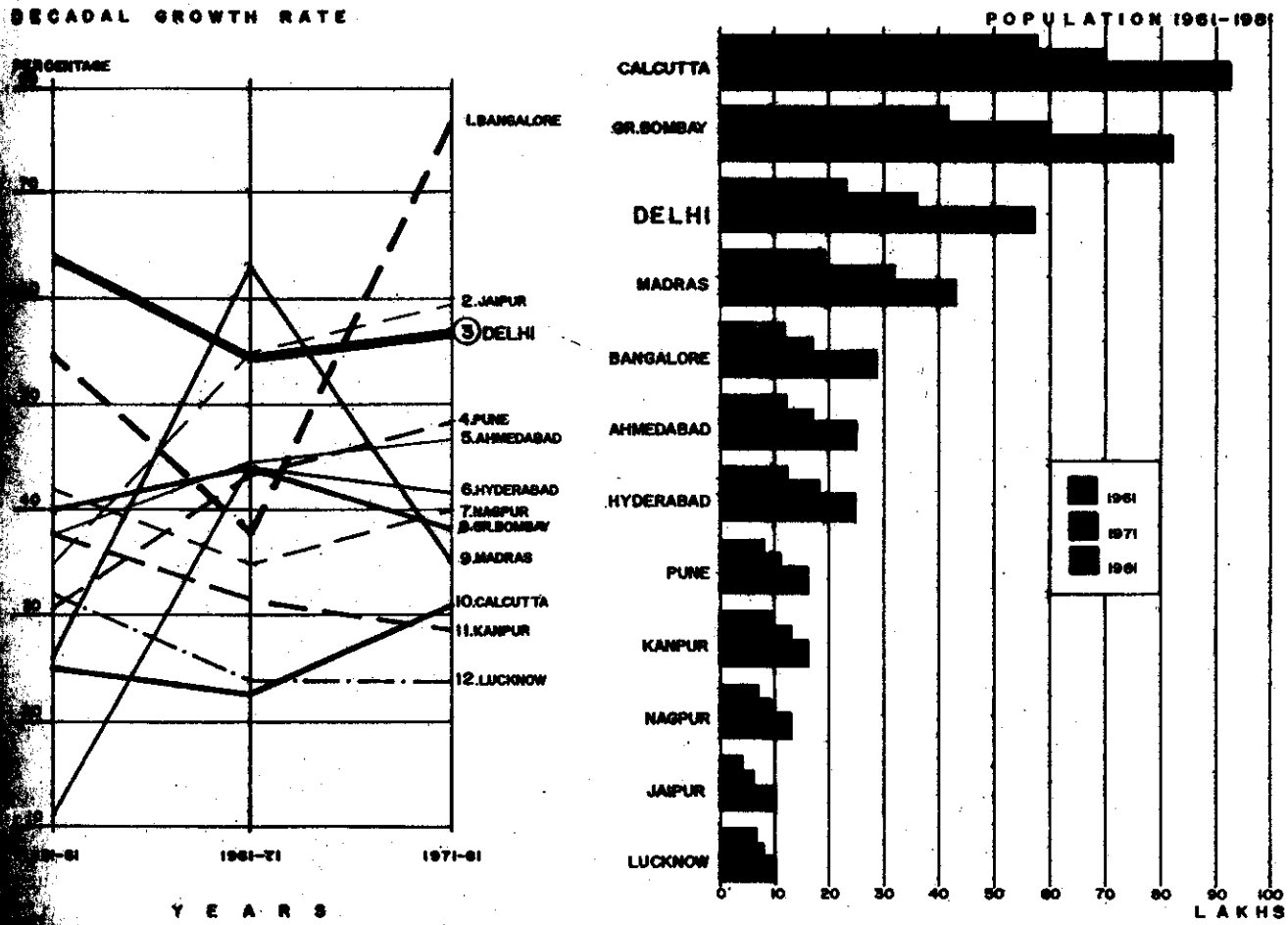
Table 2.4 Growth of Population in Metropolitan Cities 1951-81

Metropolis	Population				Growth rate %		
	1951	1961	1971	1981	51-61	61-71	771-81
Calcutta UA	4588910	5736697	7031382	9194081	25.0	22.6	30.8
Gr. Bombay UA	2966902	4150056	5970575	8243405	39.9	43.8	38.2
Delhi UA	1437134	2359408	3647023	5729283	64.2	54.6	57.1
Madras UA	1542333	1944502	3169930	4289347	26.1	63.0	35.3
Hyderabad UA	1127581	1248969	1796339	2545836	10.8	43.8	41.7
Ahmedabad UA	877329	1206001	1741522	2548057	37.5	44.4	46.3
Bangalore UA	778977	1199931	1653779	2921751	54.6	37.8	76.7
Kanpur UA	705383	971062	1275242	1639064	37.7	31.3	28.5
Pune UA	605504	790798	1135034	1686109	30.6	43.5	48.5
Nagpur UA	485264	690302	930459	1302066	42.2	34.8	39.9
Jaipur UA	304380	410376	636768	1015160	34.8	55.2	59.4
Lucknow UA	496861	655673	813982	1007604	32.0	24.1	23.8
Total	**15916558**	**21365775**	**29802035**	**42121700**	**34.2**	**39.5**	**41.3**

UA – Urban Agglomeration

Sources: 1. Census of India, 1971–Part IIA(i), General Population Tables, India
2. Census of India, 1981–Part IIB(i), Primary Census Abstract, India

Figure 3: Growth of Metropolitan Cities 1951-81



Delhi was the highest (57%) during 1971-81 but it was much higher than that of its immediate lower-Greater Bombay (38%). If all the twelve tropolitan cities are taken into account, only Banlore (77%) and Jaipur (59%) grew at higher rates n Delhi during 1971-81. Among the metropolitan s, Bangalore registered the highest growth rate ing 1971-81. All the metropolitan cities save cknow have grown at rates higher than the natial average (23.3%) during 1971-81. Metropolitan ulation growth has been markedly impressive icating higher attraction of migrants.

Population Distribution

ional Capital Region accommodated a total tion of 191.93 lakh persons in 1981. Of this tion, the UP Sub-region accounted for a hare of 36.31% followed by that of Delhi UT %), Haryana (25.73%) and Rajasthan (5.55%) 2.5).

Table 2.5 Area, Extent and Population of NCR

Sub-Region	Area Extent 1981 in sq km	Population in 1961 in millions	Population in 1971 in millions	Population in 1981 in millions
UT of Delhi	1483 (4.90)	2.66 (25.11)	4.06 (28.91)	6.22 (32.41)
Haryana	13413 (44.36)	2.89 (27.33)	3.80 (27.01)	4.93 (25.73)
Rajasthan	4493 (14.86)	0.58 (5.52)	0.76 (5.39)	1.07 (5.55)
Uttar Pradesh	10853 (35.88)	4.45 (42.04)	5.44 (38.69)	6.97 (36.31)
N.C.R.	30242 (100.00)	10.58 (100.00)	14.06 (100.00)	19.19 (100.00)

Note: Figures in brakets indicate proportions(%) of respective column figures to NCR total

The National Capital Region registered a growth of 36.48% in its population during 1971-81, while the Sub-Regions gained varied growth rates; Delhi UT exhibited a growth of 52.99% followed by Rajasthan (40.54%), Haryana (30.02%) and Uttar Pradesh (28.09%) Sub-Regions.

Similarly, net addition to the decadal (1971-81) increase in population of the Region has been mainly from Delhi UT accounting for 42.00% followed by that of Uttar Pradesh (29.80%) and Haryana (22.22%) Sub-Regions. Owing to its smaller size and lesser population, in spite of an impressive 40.54% decadal growth, Rajasthan Sub-region contributed only 5.98% of the increase in population of National Capital Region during 1971-81.

Urban population has been increasing steadily in National Capital Region over years. Nearly 48% of population in the Region resides in urban areas in 1981 as against 29.4% in 1951, 34.68% in 1961 and 39.28% in 1971.

Delhi Urban Area accommodates a population of 57.68 lakhs or 63.45% followed by Uttar Pradesh (21.44%), Haryana (13.19%) and Rajasthan (1.92%) Sub-regions.

2.3 Migration Pattern and Trend

The population of Delhi has been growing at a rapid pace since independence. The partition of the country in 1947 resulted in a large influx of refugees into Delhi. In addition, the attainment of independence and the resultant need to develop the Indian Capital created a huge demand for man power and therefore, there was tremendous influx of population into the Capital especially from the neighbouring States. Hence, when the census count was taken in 1951, it was observed that Delhi's population had increased by about 60% over that of 1941. The rate of growth of population of Delhi, however, declined to 52.40% during the decade 1951-61 but has been continuously increasing since then.

In the population Census, migrants are classified on the basis of:

i. Place of birth, or
ii. Place of last residence

A person is considered as a migrant by place of birth if the place of enumeration during the Census is other than the place of his/her birth. Similarly, a person is a migrant by place of last residence if the place in which a person is enumerated during the Census is other than the place of his/her immediate last residence. Till 1961, statistics on migration was based on 'birth place', but since 1971, it is on the basis of 'place of last residence'.

According to 1981 census, there are 22,99,252 migrants in Delhi constituting about 37% of the total population. In-migration into Delhi has been growing extra-ordinarily specially during the last two decades. Annual in-migration has increased more than three times during this period. Among the 22,99,252 migrants in Delhi, 12,29,745 persons, which form about 53.48% came during 1971-81. In the net addition of population during 1961-71, proportion of in-migrants was only 37.33% and it has gone upto 57.07% of the net additional population during 1971-81 (Table 2.6).

Table 2.6 Migration into Union Territory of Delhi

Census Year	Population	Net decadal increase	Total decadal in-migration	Proportion of in-migrants to toal population (%) in that year (4/2)	Proportion of in-migrants to net increase (4/3)	Growth of in-migrants (%) (decadal)
1941	917939					
1951	1744072	826133				
1961	2658612	914540	544198*	20.46		
1971	4065698	1407086	525309	12.92	37.33	
1981	6220406	21554708	1229745	19.76	57.07	134.10

* represents in-migrants even before 1961 and includes migrants in the category of 'period not known' (99143 persons)

An analysis of this phenomenan indicates that in-migration into Delhi has been mainly from the surrounding States (Table 2.7 and Figure 4). the National Capital Region participating States taken together accounted for about 71% of the total migrants that moved into Delhi during 1971-81. Of the total, migrants from Uttar Pradesh account for 48.2% followed by Haryana (15.5%), Punjab (9.8%) and Rajsthan (7.6%). The trend in in-migration has been that while inflow from Punjab and Haryana has declined from 11.3% to 6.4% and 16.4% to 12.9% during the decades 1961-71 and 1971-81 respectively, that of Uttar Pradesh and Madhya Pradesh has been on the increase.

In absolute terms, it is Uttar Pradesh from where maximum number of people come to Delhi. However, in relation to the State population, Haryana ranks (Table 2.8) first. During 1971-81, for every one lakh population in Haryana, 1584 persons moved to Delhi whereas from Uttar Pradesh, it was only 697. While Punjab ranked third and Rajasthan fourth in proportion to total migrants, in absolute terms, Rajasthan is above Punjab.

Figure 4 Migration Pattern in Delhi 1981

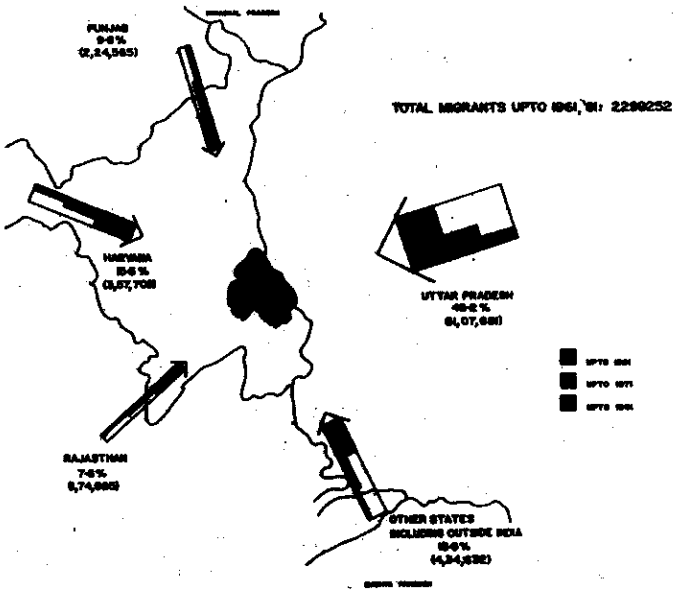


Table 2.7 Flow of Migrants into Union Territory of Delhi

State	Before 1961	1961-71	1971-81	Period not known	Total
Haryana	98324 (22.1)	85945 (16.4)	159028 (12.9)	14412	357709 (15.5)
Madhya Pradesh	5585 (1.2)	8860 (1.7)	37709 (3.1)	2496	54650 (2.4)
Punjab	749944 (16.8)	59503 (11.3)	78671 (6.4)	11447	224565 (9.8)
Rajasthan	33341 (7.5)	39885 (7.6)	93836 (7.6)	7603	174665 (7.6)
Uttar Pradesh	185550 (41.7)	260748 (49.6)	616021 (50.1)	45362	1107681 (48.2)
Others(including ouside India)	47311 (10.7)	70368 (13.4)	244480 (19.9)	17823	379982 (16.5)
Total	**445055 (19.4)**	**525309 (22.8)**	**1229745 (53.5)**	**99143 (4.3)**	**2299252 (100.0)**

Table 2.8 Ratio of Migrants to Population

State	Total population in 1961 (in lakhs)	Migrants to Delhi during 1961-71	Migrants during 1961-71 per lakh population of 1961	Total population 1971 (in lakhs)	Migrants to Delhi during	Migrants during 1971-81 per lakh population of 1971
Haryana	75.90	85945	1132	100.36	159028	1584
Madhya Pradesh	323.72	8860	27	416.54	37709	90
Punjab	111.35	59503	534	135.51	78671	580
Rajasthan	201.55	39885	198	257.65	93836	364
Uttar Pradesh	737.54	260748	353	883.41	616021	697

Note: Figures in brackets indicate percentage to the respective totals.

All the States mentioned in Table 2.7 have been sending increasing number of people to Delhi. This is evident from the fact that the ratio of migrants to the respective State population has been showing an increasing trend in all States. In the case of Madhya Pradesh, there has been a sharp increase. During 1961-71, Madhya Pradesh sent only 27 persons for every lakh population to Delhi which rose more than thrice to 90 during 1971-81.

Though migration into Delhi is taking place mainly from the neighbouring States, contribution from other States too is a prime factor leading to higher growth of population in the Capital. In fact, migration from other States (other than Haryana, Uttar Pradesh, Madhya Pradesh, Punjab and Rajasthan) has shown an increasing trend, both in absolute as well as relative terms. The proportion of flow of in-migrants from the 'other areas' has gone up from 10.6% in 1961 to about 20% in 1981.

While distance has been definitely a factor affecting migration decision, better development of any area too induces greater in-movement. Migration studies have shown that some of the developed districts of major migrant-contributing States in fact send major proportion of migrants to Delhi (Table 2.9).

Table 2.9 Districts in Decending Order from which In-migration takes place to Delhi

State	Name of the District				
Uttar Pradesh	Meerut (8.38)	Bulandshahr (6.68)	Aligarh (5.69)	Agra (2.67)	Ghaziabad (2.58)
	Garhwal (2.30)	Muzaffarnagar (1.70)	Almora (1.70)	Mathura (1.49)	Moradabad (1.43)
	Kanpur (1.41)	Etah (1.29)	Saharanpur (1.29)	Lucknow (1.25)	Azamgarh (1.23)
	Ghonda (1.03)				
Haryana	Rohtak (3.74)	Sonepat (2.16)	Gurgaon (2.16)	Karnal (1.62)	Faridabad (0.91)
Punjab	Amritsar (2.69)	Jalandhar (1.70)	Ludhiana (1.45)	Hoshiarpur (1.13)	
Rajasthan	Jaipur (2.08)	Alwar (1.11)			

Source: Socio-Economic Unit [PPD of DDA], 1980-81.

In-migration into Delhi from urban areas has been equally pronounced as that from rural areas. Of the total migrants from the five surrounding States of Haryana, Madhya Pradesh, Uttar Pradesh, Punjab and Rajasthan during 1971-81, 39.04% has been from urban areas (Table 2.10). Urban migrants formed 68% of total from Punjab. In the total migrant population, proportion of urban migrants to Delhi has been more than 30% from all the States.

The major reasons for in-migration into Delhi has been for 'employment' and 'family movement'. The large inflow into Delhi in recent times can be attributed to growth of industries, especially, small scale ones and, expansion of trade and commerce and construction activities. The twin reasons of 'employment' and 'family movement' accounted for 73% of all in-migrants in 1981 from the five States discussed earlier (Table 2.10).

Table 2.10 Rural-Urban Distribution and Cause for Migration

(Population in lakhs)

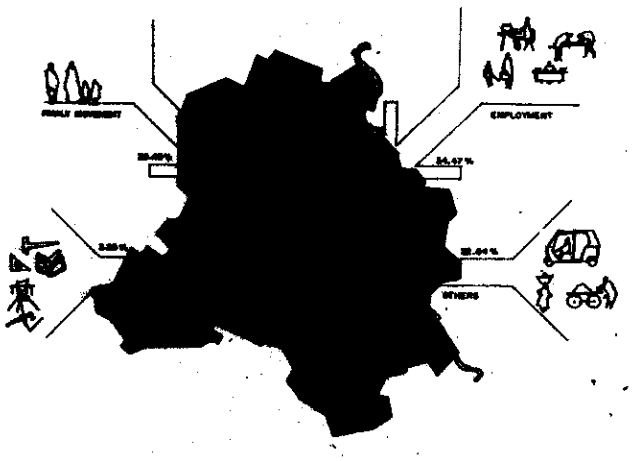
State	No. of migrants during 1971-81			Cause of migration	
	Total	Rural	Urban	Employment	Family Movement
Haryana	1.59	0.98 (61.64)	0.61 (38.36)	0.36 (22.64)	0.60 (37.73)
Madhya Pradesh	0.38	0.22 (57.90)	0.16 (42.10)	0.14 (36.84)	0.17 (44.74)
Punjab	0.79	0.25 (31.65)	0.54 (68.35)	0.16 (20.25)	0.36 (45.57)
Rajasthan	0.94	0.62 (65.96)	0.32 (34.04)	0.32 (34.05)	0.40 (42.55)
Uttar Pradesh	6.16	3.94 (63.96)	2.22 (36.04)	2.31 (37.50)	2.37 (38.50)
Total	**9.86**	**6.01**	**3.85**	**3.29**	**3.90**

Note: Figures in brackets indicate percentage to the respective totals.

When the head of a family moves to another place for employment, his family joins him after a while. Therefore, number of people migrating on account of 'family movement' is generally higher than the number on account of 'employment' (Figure 5).

An analysis of employment structure of migrant workers indicates that tertiary sector engages maximum proportion (69.17%) of all migrant workers

Figure 5 Major Factors of in-Migration 1987



followed by secondary (28.87%) and primary sectors (1.96%). Majority of the in-migrants are absorbed in petty trades, low grade production or processing activities, and the population growth-induced service sector. Incidentally, proportions of total workers in Delhi in different sectors too reflect roughly the same proportions as for migrant workers- 66.01%, 29.04% and 5.95% in tertiary, secondary and primary sectors of employment respectively).

2.4 Population Projections

Population of Delhi has been growing at a rapid pace since independence. During the four decades preceeding 1941, it gained a modest total of 7 lakhs against its 2 lakhs in 1901. However, it gained extraordinary growth rate by registering 90.2%, 52.5%, 52.9% in successive decades, and reached 53.0% in 1981 (Table 2.11).

Table 2.11 Growth of Population of Union Territory of Delhi

Year	Population in lakhs	Decennial rate of growth in percent
1941	9.17	
1951	17.44	90.18
1961	26.59	52.46
1971	40.66	52.91
1981	62.20	52.98

A major contributing factor for such an increase in the population count has been the continuous inflow of migrants. Continued growth of population and in-migration into Delhi on the scale experienced between 1971 and 1981, and continued intensification of activities and population in the existing urban Delhi, if not controlled through associated growth of and distribution over the Region, would inevitably lead to pressure on and deterioration of the limited urban services of Delhi.

Growth of population in Delhi at the present rate will soon pose a serious problem. The rate of augmentation an scarcity of some of the services already present an alarming situation. Augmentation of selected services achieved during 1961-81 and augmentation required between 1981-2001, if the present rate of population growth continues, is given in Table 2.12.

Table 2.12 Infrastructure requirement in Union Territory of Delhi

Service (units)	Augmentation achieved from			Required augmentation from 1981 to 2001		
	1961	1981	1961-81	2001	81-2001	Rate
Water (MGD)	78	335	257	1024	689	$\frac{689}{257}=2.68$
Sewerage (MGD)	36	118	82	902	784	$\frac{784}{82}=9.56$
Electricity (MM)	80	650	570	2568	2018	$\frac{2018}{570}=3.54$
Telephone Lines ('000)	27	224	197	1200	976	$\frac{976}{197}=4.95$
Hospital beds ('000)	7	14	7	61	47	$\frac{47}{7}=6.71$
Student seats in schools ('000)	400	1450	1050	320	1850	$\frac{1850}{1050}=1.76$

These conclusions compel for a substantial control in the growth of population of Delhi during the period 1981-2001.

Projections have been made for Delhi and the constituent units of NCR based on varied assumptions such as urban and rural growth differential method as has been advocated by the United Nations for projecting population of urban areas. In this method, the growth differentials of the areas

falling in NCR and other areas of the States are examined, and these differentials are then projected. Two assumptions have been made regarding the likely growth differentials in future. In the first method, it has been assumed that growth differentials may remain constant as observed during 1971-81. In the second assumption, it is taken that the change in growth differentials observed during 1961-71 and 1971-81 may continue in future. This has been termed as increasing URGD method. Same method has been used to project the rural and urban population of NCR. The ratio of the urban population in the NCR has been worked out separately for each State for 1961, 1971 and 1981. These ratios were then extrapolated using logistic model. Three assumptions were made for extrapolation:

i. The growth differential between the urban areas and rural areas would remain the same as observed during 1971-81.
ii. The above growth differential would accelerate during the coming decades. The rate of acceleration would be that that was observed during the decades 1961-71 and 1971-81.
iii. The growth differentials would, no doubt, accelerate but the rate of acceleration may be in between i and ii. In other words, the quantum of increase would be half of the observed acceleration during the last two decades.

By both these methods, the population of Delhi and the NCR part of Haryana, Rajasthan and Uttar Pradesh was projected separately and aggregated for NCR (Table 2.13).

Table 2.13 Projected Population of National Capital Region

(Population in lakhs)

Sub-region/Region	Population	Constant URGD		Increasing URGD	
	1981	1991	2001	1991	2001
Delhi	62.20	92.55	132.64	92.55	132.64
Rural	4.52	4.42	3.61	4.42	3.61
Urban	57.68	88.13	128.03	88.13	129.03
Haryana	44.39	62.51	71.50	62.70	72.16
Rural	37.32	42.10	41.40	42.23	41.78
Urban	12.07	20.41	30.10	20.47	30.38
Rajasthan	10.65	11.95	14.34	11.26	11.96
Rural	8.91	9.31	10.51	8.77	8.77
Urban	1.74	2.64	3.83	2.49	3.19
Uttar Pradesh	69.69	87.55	108.44	87.57	108.49
Rural	50.20	54.62	56.02	54.64	56.04
Urban	19.49	32.93	52.42	32.93	52.45
NCR	191.93	254.57	326.93	254.08	325.26
Rural	100.95	110.46	111.54	110.06	110.21
Urban	80.98	144.11	215.39	144.02	215.05

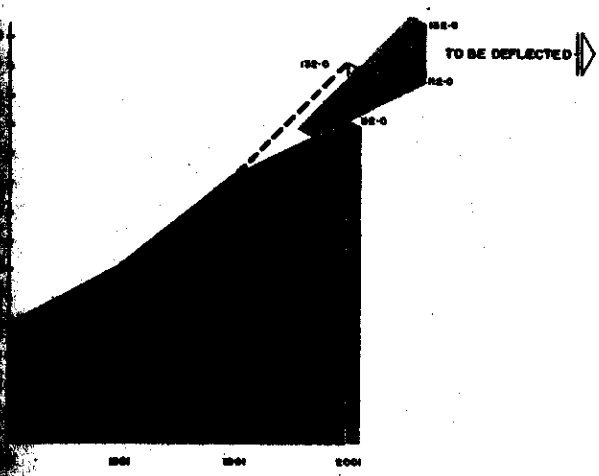
Projections indicate that if the present trend of population growth of Delhi is allowed to continue, it will reach a figure of 132 lakhs by the year 2001 A.D.

In the attempt to estimate population for Delhi, which would be well under manageable limits, the assumptions made are:

i. that the net natural growth rate of population is declining, and given various population control programmes, literacy level and adaptability of the metropolitans, the net annual natural growth would reach 12% by the year 2001. However, only a marginal reduction in the same is envisaged till the year 1991. It is assumed to come down from the 1971-81 decadal rate of 22% to 20% during 1981-91 and 12% during 1991-2001.
ii. while accepting continued in-migration during 1981-91 at the same rate observed during 1971-81, a substantial reduction in in-migration is expected during 1991-2001. In this decade, approximately 50% reduction in in-migration is envisaged.

Under such assumptions, the population of the Union Territory of Delhi would be 112 lakhs by 2001 of which 2 lakhs would be rural (Table 2.14 and Figure 6).

Figure 6 Delhi: Population Projection 1981-2001



JECTED POPULATION: 132 LAKHS
NED POPULATION: 112 LAKHS
MPTIONS:
ral annual growth rate to fall
2% (1981) to 2% by 1991
to 1·2 % (2001)
ined in-migration till 1991 and a
reduction between 1991 - 2001

2.14 Population Projection for Union Territory of Delhi

(Population in lakhs)

Population	Increase over last decade			
	Total	By in-migration	By natural growth	Overall growth rate (decadal)
40.66				
62.20	21.54	12.29 (19.77)*	9.24 (22.67)**	(53.00)
92.56	30.36	17.95 (19.39)*	12.43 (20.00)**	(48.87)
112.00	19.44	8.33 (7.43)*	11.10 (12.00)**	(21.00)

tion of in-migrants during the decade to the ulation in that year.
net natural growth rate.
es in brackets indicate percentages.

To restrict the population of Delhi to 112 lakhs, measures are to be taken so that the annual in-migration into the city is controlled to about 80,000 persons during 1991-2001 from the observed rate of 1.23 lakh persons per annum during 1971-81 and expected rate of 1.80 lakh persons per annum during 1981-91. It would bring down the proportion of migrants to the total population to 7.43% in the year 2001 from the observed 19.76% during 1971-81 and expected 19.39% during 1981-91. Further, the overall decadal growth of Delhi would be 21% during 1991-2001 against the 1971-81 rate of 53% and the expected 1981-91 rate of 48%.

2.5 Population Projection for Delhi Metropolitan Area

The DMA which forms a contiguous urban area around Delhi has shown great potential for housing and industrial activities primarily owing to its location being adjacent to Delhi. This growth immediately adjoining to the city limits is striking and has been sharply increasing, indicating the spatial expansion of urban influence. This rapid growth in DMA has beem directly related to industrial development around Delhi, creation of NOIDA township by Uttar Pradesh, proposed development of Kundli industrial township by Haryana, merging of Narela town within Delhi Urban Area, spurt in the concentration of industrial and institutional activities along the Delhi-Gurgaon National Highway and Faridabad-Ballabgarh highway. While this increase to some extent would reduce the problems of Delhi, this would lead to problems of greater magnitude in terms of stress on Delhi's services unless these areas are planned in a regulated and co-ordinated manner. Further, unless they are planned in an integrated manner with Delhi and the surrounding National Capital Region, the DMA towns would identify themselves with the urban form of Delhi and become a single urban continuum.

Recognising the potential of DMA in solving the problem of over-congestion in Delhi, a modest growth has been proposed for the DMA towns (Table 2.15).

Presently, the DMA including Delhi accommodates about 70 lakhs of population of which Delhi alone has 62 lakhs and remaining 8 lakh persons reside in the other DMA towns. While Delhi has been projected to accommodate 110 lakhs of urban population by 2001, the other DMA towns would

Table 2.15 Population of DMA 1981-2001

Units of DMA	Population 1981 in lakhs	Population 2001 in lakhs	Average Annual growth rate of population 1981-2001
UT of Delhi	62.20	112.00	4.00
Faridabad–Ballabhgarh	3.30	10.00	10.15
Gurgaon	1.01	7.00	29.65
Bahadurgarh	0.37	2.00	22.02
Kundli		1.50	
Ghaziabad-Loni	2.97	11.00	13.52
NOIDA		5.50	
Total of DMA	**69.85**	**149.00**	**5.66**

accommodate a total of 37 lakhs of population (Table 2.15). Delhi will have 2 lakhs of rural population, and the rural areas of DMA falling in Haryana and Uttar Pradesh are envisaged to accommodate 50,000 persons in each state.

2.6 Population Assignments for rest of National Capital Region

A significant tact about the migration into Delhi is that majority of migrants are from the immediate surrounding States of Delhi. The excess population of 19 lakhs of persons who would otherwise be moving into Delhi by 2001 will have to be contained in the urban areas outside DMA but within National Capital Region. It is proposed to accommodate 5 lakhs, 1 lakh and 13 lakhs of persons in the Sub-regional areas of Haryana, Rajasthan and Uttar Pradesh beyond DMA respectively.

The projected and assigned population for the Sub-regions and DMA towns are given in Table 2.16.

Table 2.16 Population Assignment by 2001 AD for Delhi, DMA & NCR

(in lakhs)

Sl. No.	Area	Population 2001					
		Projected			Assigned		
		Total	Urban	Rural	Total	Urban	Rural
1.	Region	325	234	91	325	234	91
2.	Delhi Sub-region	132	129	3	112	110	2
3.	Haryana Sub-region	72	38	34	77	42.5	34.5
4.	Rajasthan Sub-region	12	3.5	8.5	14	5	9
5.	Uttar Pradesh Sub-region	109	63.5	45.5	122	76.5	45.5
6.	Delhi Metropolitan area						
	a) Total	170	166	4	150	147	3
	b) Delhi				112	110	2
	c) Haryana				17	16.5	0.5
	d) U.P.				17	16.5	0.5
7.	DMA Towns				37	37	
	a) Ghaziabad including Loni					11	11
	b) NOIDA					5.5	5.5
	c) Faridabad					10	10
	d) Gurgaon					7	7
	e) Bahadurgarh					2	2
	f) Kundli				1.5	1.5	
8.	Other towns outside DMA			(urban 87 and rural 88 lakhs)			
	a) Haryana	17	17			22	22
	b) Rajasthan	4	4			5	5
	c) U.P.	47	47			60	60

LEMENT SYSTEM

3

l-Urban Concentration

ding to the 1981 census, National Capital ccommodates a total population of 191.93 which about 91 lakhs accounting for 48% is ast increasing trend of urban population is rom the declining proportion of rural popu- m 65.32% in 1961 to 60.72% in 1971 and to in 1981. Increase in urban population in NCR ng Delhi has been comparatively slower ing a proportion of 16.55% in 1961 to 18.78% and 25.6% in 1981.

ong the Sub-regions, urbanisation process e years has been relatively slower in Rajas- n in Uttar Pradesh and Haryana Sub-regions. the present (1981) rural-urban population 52.6 : 47.4 in NCR, it is envisaged that it will 2 by the year 2001. Assigned urban popula- ponent is envisaged to account for 98.21%, 5.71% and 62.70% in Delhi, Haryana, Rajas- Uttar Pradesh Sub-regions respectively, eir respective projected proportions of 2.77%, 29.17% and 58.25% by 2001 (Table

l Settlement System

re 6677 villages (1981) in NCR. Villages are nently medium sized with 55% of them hav- lation 500-1999 persons and 20.75% 2000- ons. While large villages with population 00 formed 3.45%, smaller ones with popu- than 500 formed 20.71% of the total num- es. (Table 3.1). In Rajasthan Sub-region, % of the villages are smaller. Delhi and h Sub-regions have highest number of d settlements.

large number of rural settlements, it is dentify, for the location of relatively facilities, some basic villages which o serve large number of the scattered vering more area.

3.3 Urban Settlement Pattern

There are 94 towns in NCR with 6 in the Union Territory of Delhi, 58 in Uttar Pradesh, 27 in Haryana and 3 in Rajasthan Sub-regions. There has been a spectacular increase from 48 to 94 in the number of towns during the period 1971-81. During the decade 1961-71, there was an addition of only 4 towns (Table 3.2).

Tabel 3.2 Distribution of Urban Settlements

	Number of Towns in						
	1961	1971	1981				
Size Class	NCR	NCR	NCR	Delhi UT	U.P. Sub-region	Haryana sub-region	Rajasthan sub-region
I.	2	4	11	1	4	5	1
II.	3	6	3	—	2	1	—
III.	10	9	16		12	4	—
IV.	12	13	28	1	17	8	2
V.	13	14	33	4	20	9	—
VI.	4	2	3	—	3	—	—
All classes	44	48	94	6	58	27	3

There are 11 Class I urban centres including Delhi accommodating about 70% of urban population of NCR. Delhi urban area alone contains 57 lakh persons and the other Sub-regions accommodate lesser proportions of urban population. As such, as much as 63.45% of the entire urban population of NCR is concentrated in Delhi alone. Of the remaining, 21.44% is in Uttar Pradesh, followed by 13.19% in Haryana and 1.92% in Rajasthan Sub-regions. Class-wise proportions of urban population in Class I to VI

urban centres are 70.32%, 1.38%, 4.55%, 3.14%, 2.30% and 0.10% respectively (Table 3.3). Figure 7 shows the existing urban settlement system.

3.4 Growth Pattern of Urban Areas

Towns have been classified as very fast growin

Tabel 3.3 Density Patterns of Towns in NCR–Classwise: 1981

Class Size	Delhi UT				Uttar Pradesh Portion				Haryana Portion				Rajasthan Portion			
	No.	Pop. Lakhs	Area km²	Class Average Density Persons/ km²	No.	Pop. Lakhs	Area km²	Class Average Density Persons/ km²	No.	Pop. Lakhs	Area km²	Class Average Density Persons/ km²	No.	Pop. Lakhs	Area km²	Cla Ave ra De P so
I	1	57.29	540.74	10595	4	10.30	161.81	6366	5	8.48	252.79	3346	1	1.46	80.00	1
II	–	–	–	–	2	1.55	24.72	6261	1	0.52	6.06	8508	–	–	–	
III	–	–	–	–	12	3.66	56.18	6518	4	1.35	27.09	4993	–	–	–	
IV	1	0.13	17.00	743	17	2.24	93.68	2395	8	1.09	35.47	3078	2	1.73	41.64	4
V	4	0.26	34.17	770	20	1.63	74.62	2176	9	0.65	29.58	2195	–	–	–	
VI	–	–	–	–	3	0.11	8.73	1300	–	–	–	–	–	–	–	
All classes NCR	6	57.68	591.88		58	19.49	419.74		27	12.07	350.99		3	3.19	121.64	

fast growing and stagnating towns. Those that have registered annual growth rate less than the national average of 2.33% have been grouped as stagnating while those that registered almost double that of the national annual average urban growth rate of 4.5% and above as very fast growing, while those having above one and a half times (6.75% of urban growth rate) but less than double the national average urban growth rate (9%) are considered as fast growing.

The very fast growing towns identified are Ghaziabad (124.88%) and Modinagar (101.67%) in Uttar Pradesh Sub-region and, Faridabad Complex (169.40%), Halley Mandi (350.27%) and Ganaur (96.32%) in Haryana Sub-region during 1971-81. The fast growing towns identified are Bulandshahr (73.83%) and Muradnagar (86.25%) in Uttar Pradesh and, Gurgaon (76.51%) and Sonepat (75.29%) in Haryana Sub-regions. The stagnating towns are Anupshahr (23.99%), Faridnagar (20.89%), Bug-Rasi (16.12%), Shahjehanpur (20.80%), Dankur (14.78%), Jahangirpur (21.29%) from Uttar Pradesh and, Bawal (18.88%), Rewari (17.49%), Maham (11.20%), Beri (9.35%), Farukhnagar (16.04%) and Ferozepur Jhirka (18.06%) from Haryana Sub-regions. Efforts to revitalise the economy of these towns by strengthening the facilities in them are necessary.

3.5 Major Urban Structure

Present migration being primarily from the rounding States, it is imperative that any attemp the control of population in Delhi has to be asso ed with developmental efforts in the adjo States. It is only logical to reason that Delhi b migrant population should be contained in beyond DMA by providing suitable employ opportunities since 'employment' and subseq 'family movement' form the major reasons for migration. Spatial organisation of 'central pl that serve themselves and also the surrounding tered rural population requires utmost consi tion. The urban settlement structure with its h order services and centralised functions form back-bone of any region. Such a structure, to be ducive, should be based on the objectives and and ultimately on the form of development t attained.

Various conceptual physical forms such as d loping large number of settlements (Figure 8), loping small towns (Figure 9), developing combines (Figure 10) and developing intensiv few select centres (Figure 11) that could be ad for NCR have been analysed.

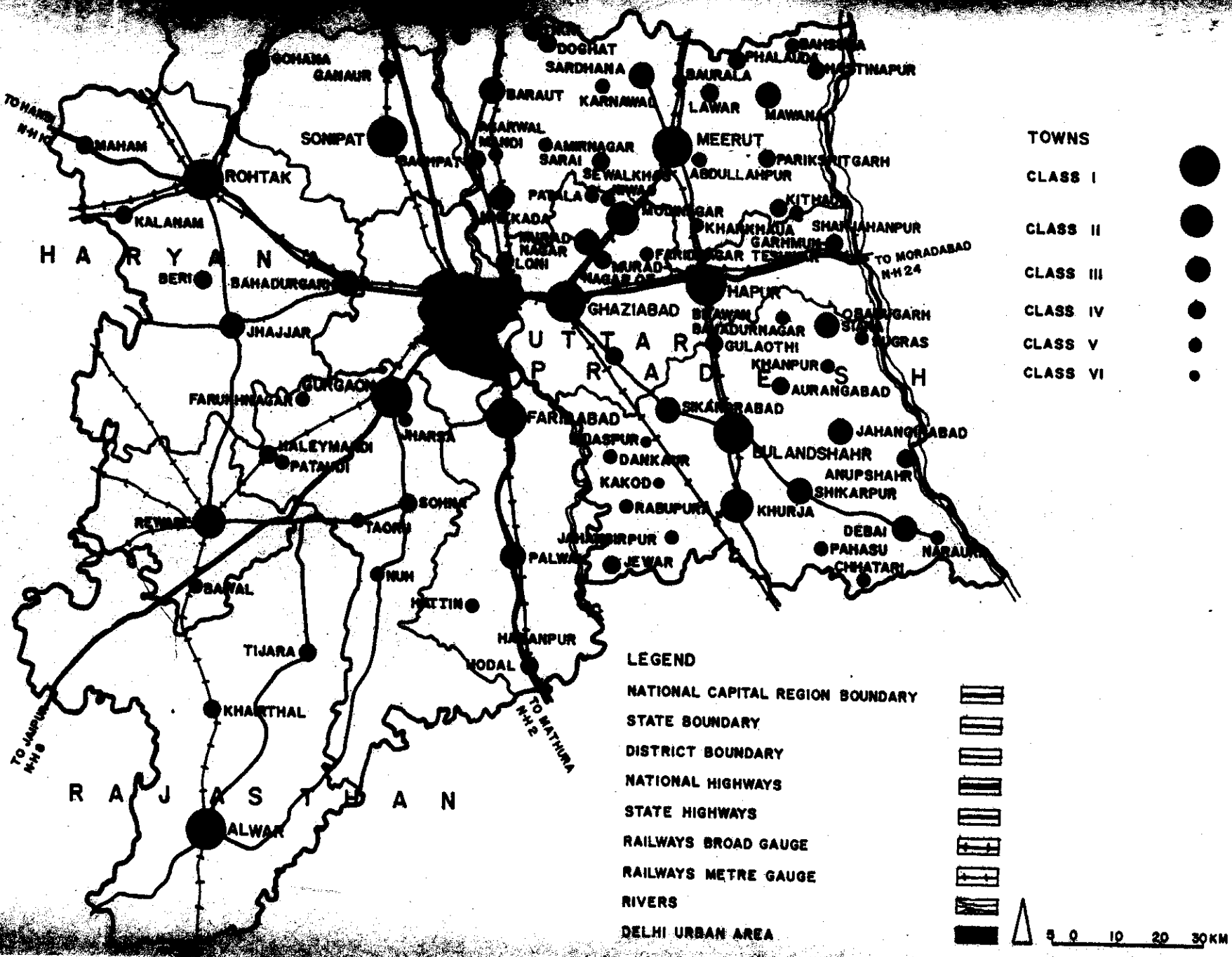

HARYANA
UTTAR PRADESH
RAJASTHAN
DOGHAT
SARDHANA
BARAUT
KARNAWAL
BAURALA
LAWAR
MAWANA
HASTINAPUR
SONIPAT
MEERUT
AMINAGAR SARAI
SEWALKHAS
ABDULLAHPUR
PARIKSHITGARH
ROHTAK
KALANAUR
MAHAM
PATALA
MODINAGAR
KITHAUR
KHARKHAUDA
SHAHJAHANPUR
GARHMUKTESHWAR
TO MORADABAD N-H 24
LONI
MURAD NAGAR
HAPUR
GHAZIABAD
BHAWANI BAHADURNAGAR
GULAOTHI
OBRA DUGARH
SUGRAS
KHANPUR
AURANGABAD
SIKANDRABAD
BULANDSHAHR
JAHANGIRABAD
ANUPSHAHR
SHIKARPUR
KHURJA
DEBAI
PAHASU
CHHATARI
NARAURA
JEWAR
PALWAL
FARIDABAD
GURGAON
FARUKHNAGAR
JHARSA
HATHIN
HASANPUR
HODAL
TO MATHURA N-H 2
SOHNA
TAORU
NUH
BAWAL
TIJARA
KHAIRTHAL
TO JAIPUR N-H 8
ALWAR
JHAJJAR
BERI
BAHADURGARH
TOWNS
CLASS I
CLASS II
CLASS III
CLASS IV
CLASS V
CLASS VI
LEGEND
NATIONAL CAPITAL REGION BOUNDARY
STATE BOUNDARY
DISTRICT BOUNDARY
NATIONAL HIGHWAYS
STATE HIGHWAYS
RAILWAYS BROAD GAUGE
RAILWAYS METRE GAUGE
RIVERS
DELHI URBAN AREA
5 0 10 20 30 KM

Figure 8: Alternative–I Developing Large Number of Settlements

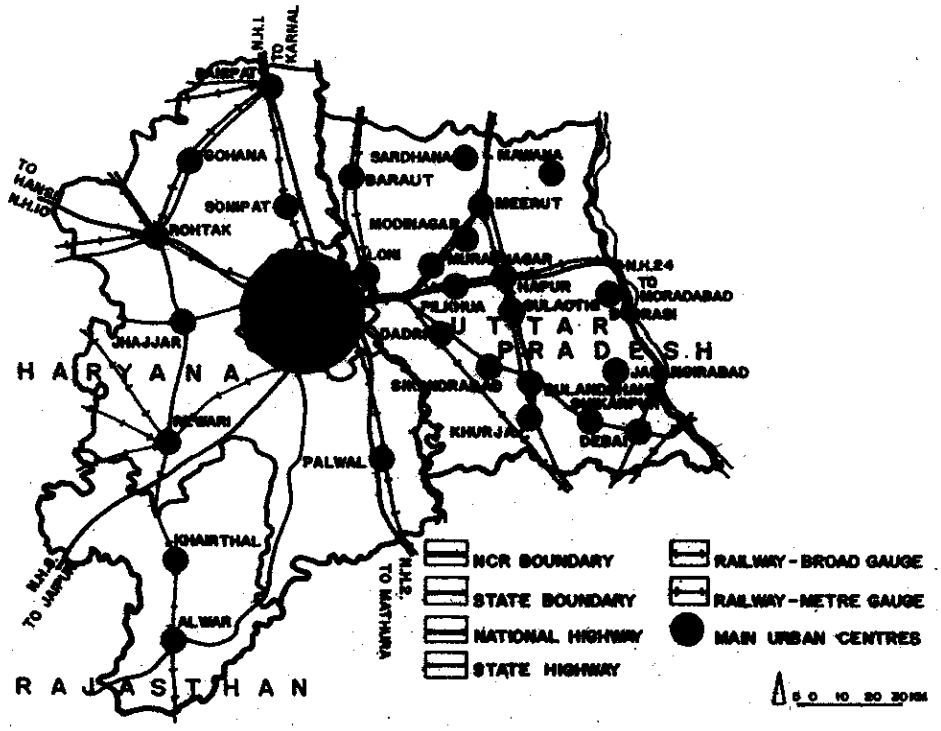


Figure 9: Alternative–II Developing Small Towns

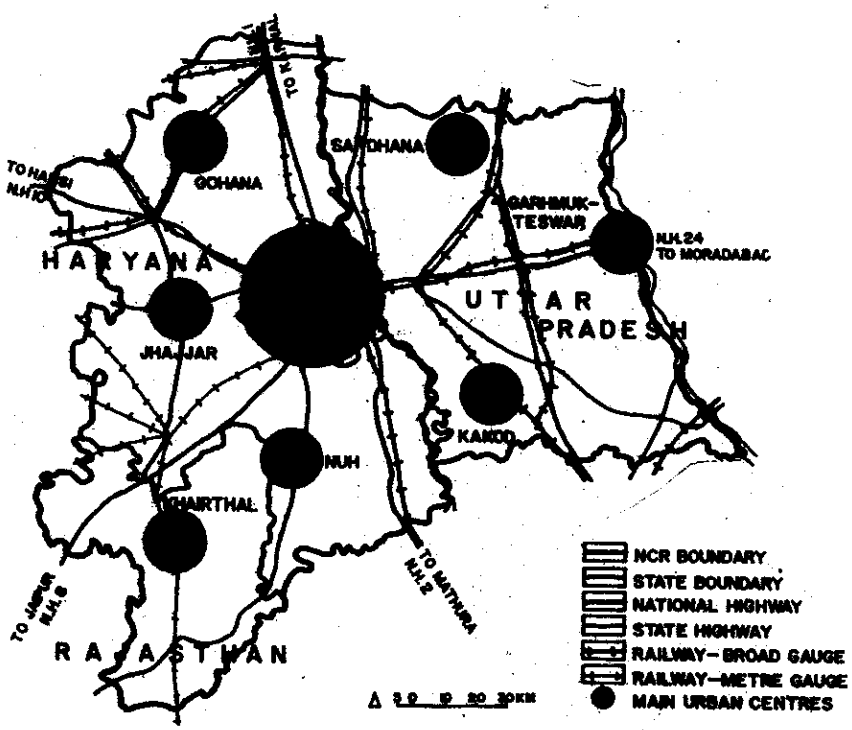


Figure 10: Alternative-III Developing Urban Combines

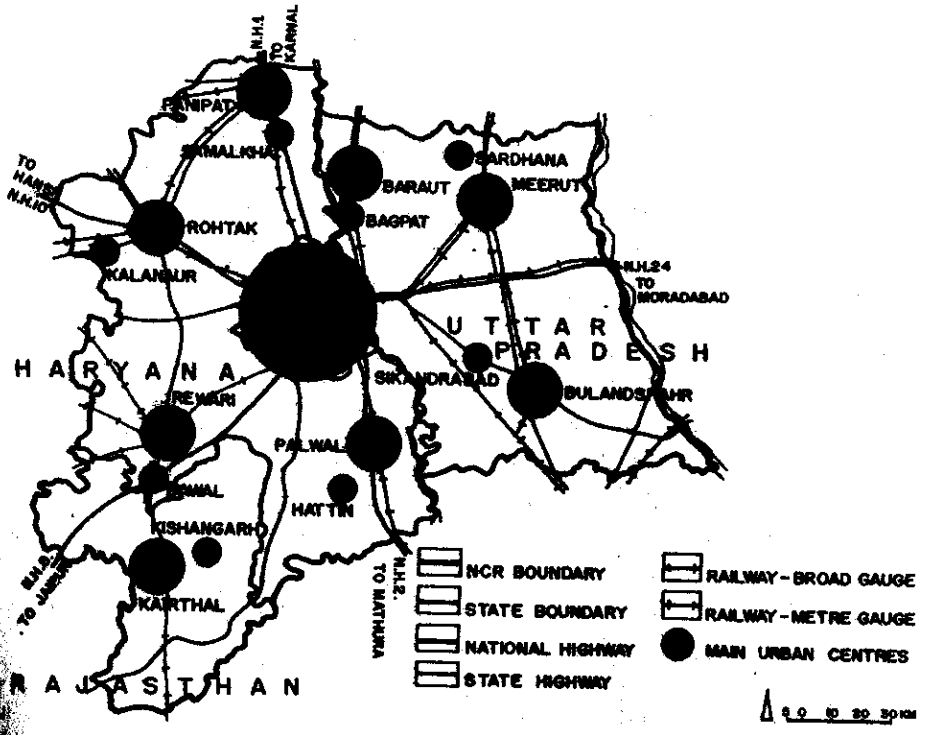
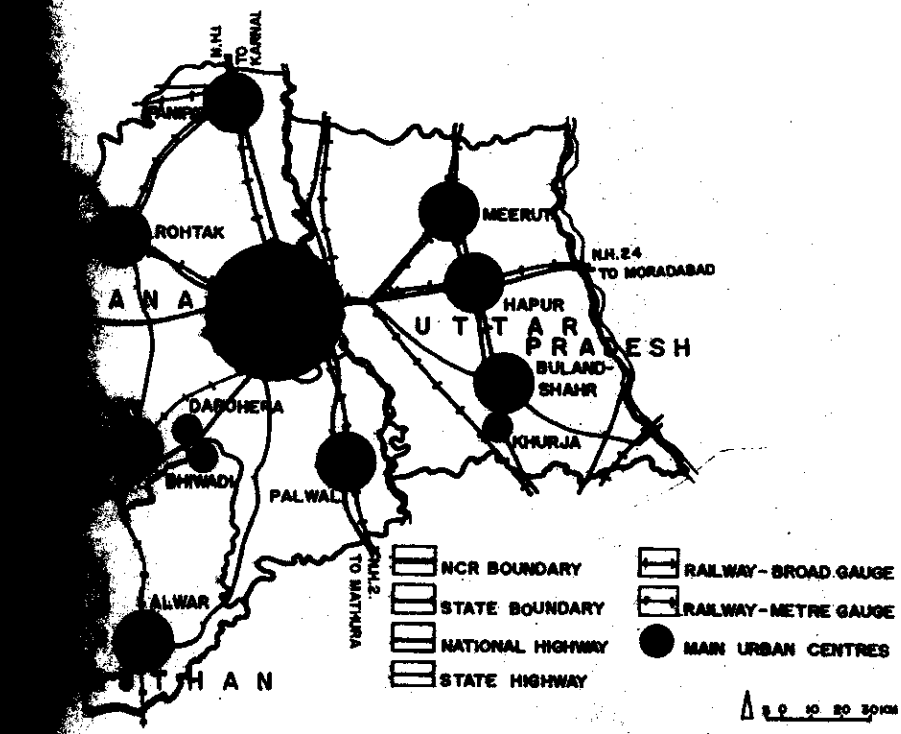


Figure 11: Alternative-IV Developing Intensively Few Select Centres



Some of the factors that have been considered to evaluate them are that:

i. any intensified development should be reasonably away from Delhi so that people do not wish to stay in Delhi and commute to their work places in the Region.
ii. the identified prime centres of any form are roughly equidistant from Delhi so that selection of settlements by the entrepreneurs or others becomes a question of direction rather than distance.
iii. centres of such a form offer viability in terms of resource availability in the vicinity to accommodate projects on a larger scale that can attract population in a substantial magnitude.
iv. such a physical form recognises the present development attained especially in terms of linkages and activity concentration – in short – the logical directions of growth and as such require minimal funds.

An analysis of various possible forms lead to the conclusion that a form which would involve 'developing a few select centres on an intensified scale (Figure 11) so that they can act as migrants-capturing magnets and, can form the apex of the hierarchical order of the settlements in the Region is the most viable one. Such an approach and urban form is expected to counteract the pull factors exerted by Delhi, and this would create spatial points in which, by providing for physical and social capital, revitalisation of the regional economy could be gained.

Availability of substantial extent of land for human habitation in the surrounding areas of NCR beyond Delhi is evident from Table 3.4. While Delhi has only 0.24km² of land for 1000 persons, the Sub-regions of Rajasthan, Haryana and Uttar Pradesh have 4.18, 2.71 and 1.56 km² respectively. Low densities and availability of vast open spaces in the surrounding urban areas beyond Delhi too are evident from the higher urban land availability per 1000 persons (Table 3.4).

Table 3.4 Man – Land Ratio

Sub-region/Region	Population 1981			Land per 1000 persons in km²		
	Rural	Urban	Area in km²	Rural	Urban	Total
Delhi	4,52,206	57,65,200	1483.00	1.97	0.10	0.24
Uttar Pradesh	50,19,579	19,49,067	10853.00	2.07	0.22	1.56
Haryana	37,31,837	12,06,704	13412.48	0.35	0.29	2.71
Rajasthan	8,99,513	1,73,956	4492.90	0.49	0.70	4.18
NCR	**100,94,175**	**90,97,927**	**30241.38**	**2.85**	**0.16**	**1.57**

The first order priority settlements in the participating States are:

i. Uttar Pradesh Sub-region : Meerut, Hapur and Bulandshahr-Khurja
ii. Haryana Sub-region : Panipat, Rohtak, Rewari-Dharuhera and Palwal
iii. Rajasthan Sub-region : Alwar and Bhiwadi

While adopting such a strategy and physical form, this Plan envisages utilisation of transport corridors as a tool to disperse the activities from the central city at sufficiently distant places rather than concentrating/encouraging development along any corridor. This backbone urban skeleton system would be linked amongst themselves by road and rail systems to facilitate their inter-nodal movement and should be well connected with Delhi by higher standard roads and by rapid public transit systems.

Further, based on the selected priority urban centres, a four tier system of settlements would be evolved to include regional centres, sub-regional centres, service centres and basic villages. The functional character of such centres is to be identified in terms of the availability and location of infrastructural and social services.

This plan aims for a compact and orderly growth of urban Delhi with moderate and suppressed growth in DMA and a few priority settlements of first order which would be fully self contained in matters of activities, employment opportunities and associated infrastructure, nevertheless having intense interaction with Delhi to gain rather than to lose to it. It is envisaged to develop these priority towns immediately so that they are able to absorb and retain not only their own natural increase but to arrest and contain potential migrants to Delhi from their surrounding region.

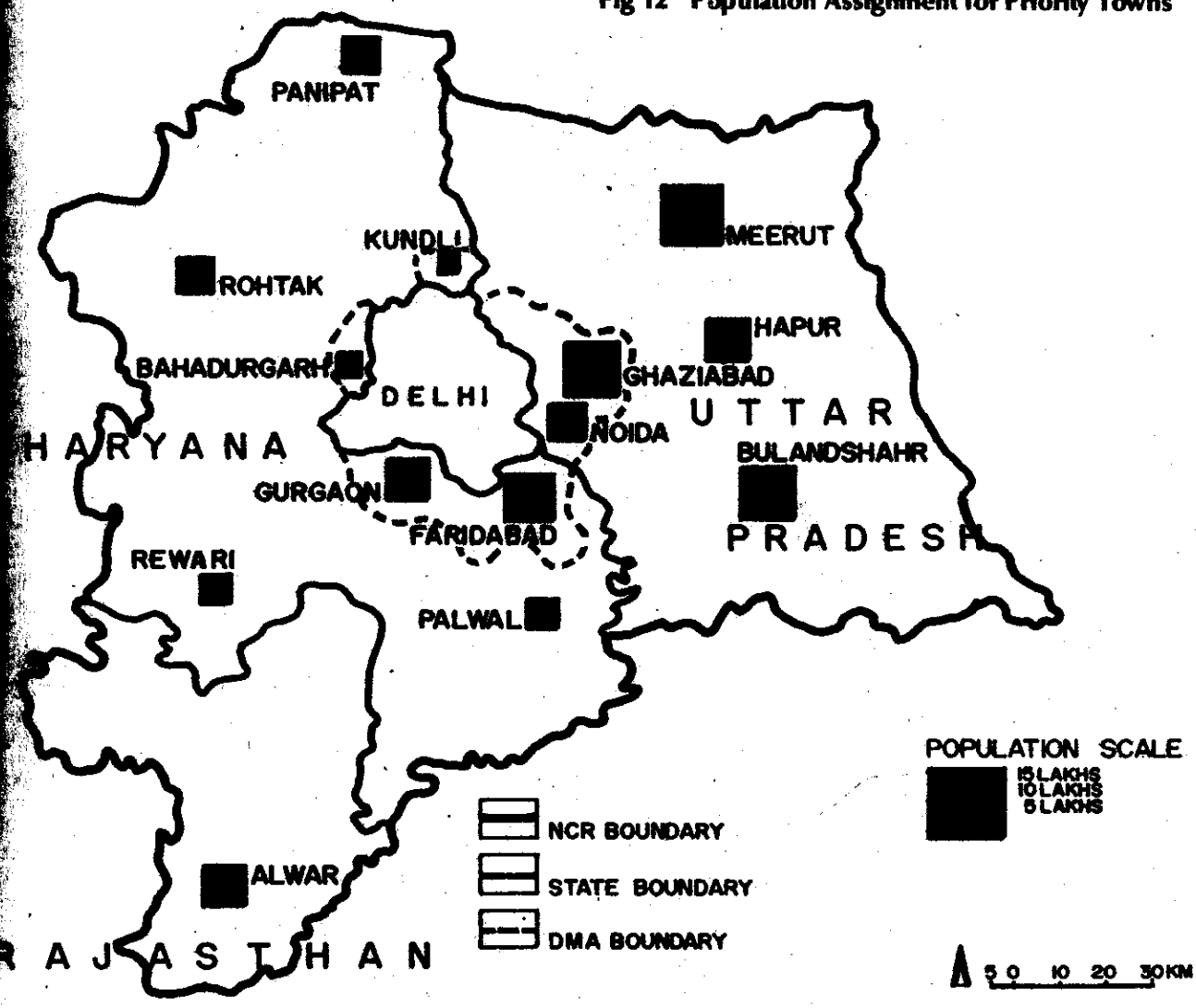
The selected priority towns are expected to unter-act the pull exerted by Delhi. It is proposed achieve this by generating employment-opportu-ies of a greater magnitude and other associated astructure facilities. Existing, projected and gned population for the priority towns is given in le 3.5 (Figure 12).

Table 3.5 Assigned Population for Priority towns – 2001

Population in lakhs

Priority towns	Actual population 1981	Projected population 2000	Assigned population 2001
Meerut	5.36	10.28	13
Hapur	1.02	2.03	6
Bulandshahr	1.03	2.35	10
Khurja	0.67	1.21	
Palwal	0.47	0.63	3
Panipat	1.38	2.86	5
Rohtak	1.68	2.97	5
Rewari Dharuhera Bhiwadi	0.52	0.77	3
Alwar	1.47	2.85	5
Total	**13.60**	**25.95**	**50**

Fig 12 Population Assignment for Priority Towns



DEVELOPMENT OF ECONOMIC ACTIVITIES

4

3.1 Objectives

The Plan advocates development of economic activities and creation of jobs in the various occupations in such a balanced manner so as to lend stability to the economy of the Region as well as take advantage of the dynamic quality of the urban concentration in and around the National Capital.

The National Capital Region Plan is conceived as an inter state regional plan with a view to achieving the objectives of keeping within manageable limits the population of Urban Delhi through adoption of a well conceived urban growth combined with development of towns within the National Capital Region. As is well known, Delhi's growth has occurred by leaps and bounds in recent decades due to increased inmigration of people from different parts of country and more particularly from the neighbouring areas. It is felt that urban concentration in and around Delhi holds potential for tremendous growth which has to be channelised suitably. Employment opportunities is the principal pull factor for large scale migration to Delhi from rural and urban areas. This can only be curbed if there are adequate employment opportunities in other growth centres existing or to be developed. Major employment generators for dispersal within the National Capital Region fall under three categories: Central Government and Public Sector Undertakings, wholesale and distributive trade and commerce, and industries.

4.2 Policies

In order to achieve the objectives, the Plan proposes the following policies:

A Broad Regional Level Policies

i. For the development of economic activities in the National Capital Region, a three tier approach should be followed. A policy of strict control for creation of employment opportunities within the Union Territory of Delhi, moderate control outside Delhi within the Delhi Metropolitan Area and, encouragement with incentives in the area outside the Delhi Metropolitan Area within the NCR is proposed for the balanced development of the Region.

ii. The policy of development of economic activities in the Region should take into account the impact of various proposals made in the Interim Development plan regarding settlement pattern, transport structure, etc. Moreover, it should be an integrated policy for the Region as a whole and should be pursued at the sub-regional levels so as to effectuate the broader objectives of the Plan. It should have the twin objectives of fostering rapid economic growth and achieving balanced development of the Region.

iii. There should be definite attempt to change the basic character of the regional economy of the Region from the agricultural and preindsutrial to more diversified one, in order to raise the earning capacity of the people. By 2001, nearly 70% of the population would be living in urban areas. This would entail the creation of more jobs in non-agricultural occupations than at present. For this purpose, there should not only be an injection of additional activities in existing and new centres outside urban Delhi but also development of agro-based industries in rural areas in order to support urbanisation on the one hand and to stabilise the rural economy on the other.

iv. In the Region, the land is generally good for agriculture, and hence selection of sites for the development of these activities should be done judiciously.

v. There is a need for streamlining not only the fiscal and other incentives given by the con-

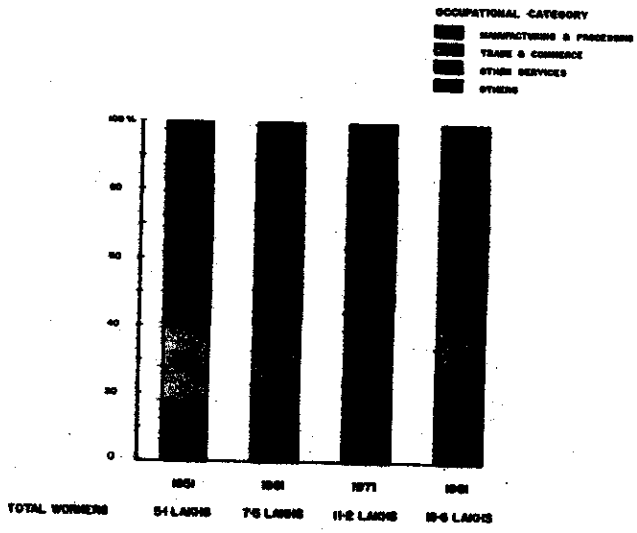
cerned State governments but also tax structure in the Region. It should also be possible to rationalise the octroi and other taxes in Delhi and in the various towns for mutual benefits and in the overall interest of the Region. This will also enable a free flow of goods and encourage economic development.

Specific Area Policies

Policy Regarding Location of Industries

Delhi has experienced a great spurt in the industrial activities during the past two decades. The distribution of working force in Urban Delhi from 1951 to 1981 (Table 4.1 and Figure 13) reveals a shift in the occupational structure of having 43.7% in other services thus depicting a predominant administrative character in 1951 declining to 31.5% in 1981. The percentage of workers in trade and commerce remained almost the same in the last four decades whereas the percentage of workers in industrial sector has increased from 17 in 1951 to 29 in 1981. Thus, Delhi which in 1951 and 1961 had predominantly administrative function is becoming an industrial city. The growth of industries in Delhi followed a typical trend, with slow progress upto 1970-71 and rapid one from 1976 onwards.

Fig 13 Occupational Structure Functional Shift

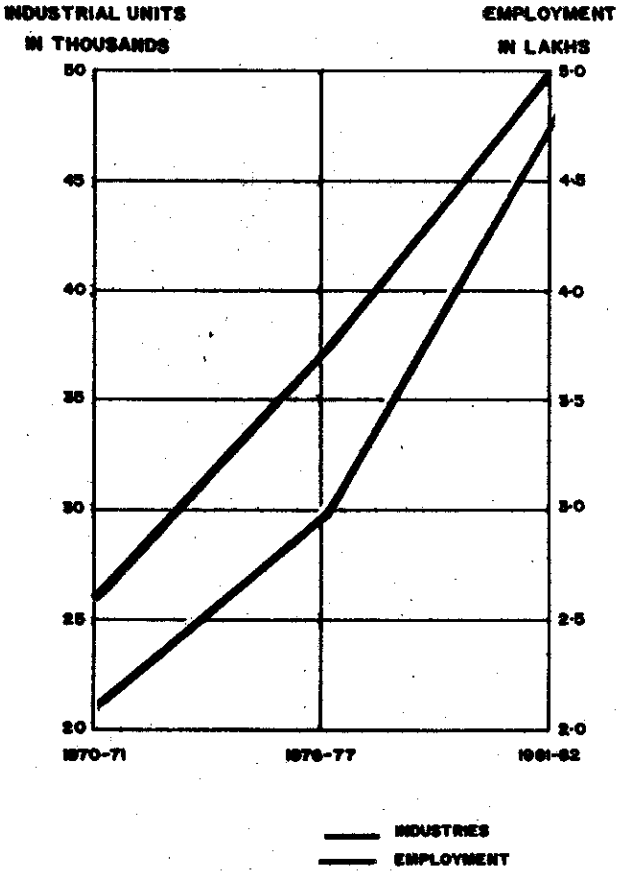


4.1 Distribution of Working Force in Urban Delhi 1951 to 1981

	1951		1961		1971		1981	
ories	Workers	%	Workers	%	Workers	%	Workers	%
tivators	3483	0.7	5178	0.7	5176	0.5	7227	0.39
l. labourers	584	0.1	1242	0.2	3603	0.3	4772	0.25
estock, forestry	–	–	–	–	–	–	–	–
ning & Quarrying	1521	0.3	5446	0.7	9091	0.8	4745	0.25
nufacturing, cessing Household Industry	6632	1.3	12684	1.7	25107	2.2	31349	1.69
Other than household	80639	15.7	155099	20.7	242733	21.7	510748	27.49
nstruction	44948	8.7	32540	4.4	61517	5.5	118699	6.39
de and Commerce	117338	22.8	143809	19.3	239719	21.6	413430	22.25
nsport and mmunications	34455	6.7	47387	6.3	107324	9.6	168457	9.07
er services	224426	43.7	343430	46.0	422667	37.8	584663	31.47
l Workers	**514026**	**100.0**	**746815**	**100.0**	**1116937**	**100.0**	**1857545**	**100.00**
ulation	1437134	–	2359408	–	3647023	–	5768200	–
icipation ratio	**27.96**	–	**31.65**	–	**30.62**	–	**32.20**	–

There was a sharp increase in the number of units from 26,000 in 1970-71 to 50,000 in 1981-82 i.e. an increase of 8.4% per annum. The industrial employment increased from 2.15 lakhs in 1970-71 to 4.80 lakhs in 1981-82 registering a growth rate of 11.2% per annum (Figure 14).

Fig 14 Growth of Industries and Employment



The investments in this sector which were of the tune of Rs 190 crores in 1970-71 have multiplied more than five times to Rs 965 crores in 1981-82. The spurt of activity in this sector has also been reflected in the production figures. The value of the production which was around Rs 388 crores in 1970-71 has multiplied six times to reach Rs 2350 crores in 1981-82 (Table 4.2)

Fig 15 Factory and Employment 1979-82

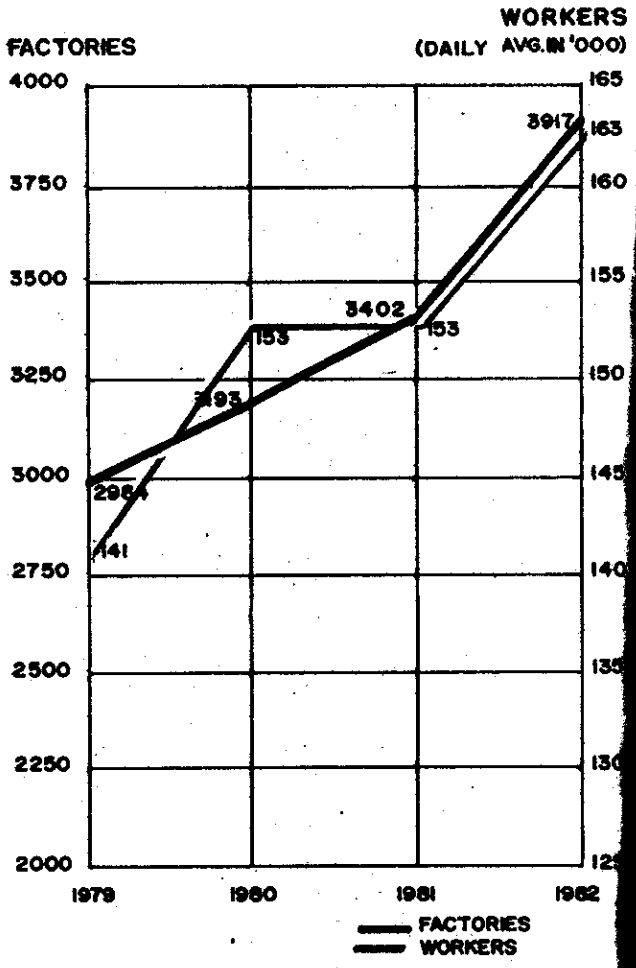


Table 4.2 Industrial Progress in Delhi

Item	1970-71	1976-77	1977-78	1978-79	1979-80	1980-81	1981-8
No. of industrial units (in '000)	26	37	40	41	42	45	5
Investment (Rs. in crores)	190	550	600	650	700	867	96
Production (Rs. in crores)	388	1025	1200	1430	1700	2196	235
Employment (in '000)	215	300	325	350	375	450	48

data available regarding registered factories, constitute the organised sector of industrial shows that there were in all 3917 factories in registered under Factories Act against 2984 factories till 1979. Thus, about 1000 factories have been added in a span of only four years. The number of daily workers added in this period is 22000. (Table 4.3 and Figure 15).

4.3 Registered Factories in Delhi (Group-Wise)

tion	Number of factories				Workers (daily average in '000)			
	1979	1980	1981	1982	1979	1980	1981	1982
od products	114	124	130	142	7	9	9	10
tiles & textile ducts	457	520	545	622	43	46	46	49
od products	46	47	52	56	1	1	1	1
er products and nting	230	223	255	279	11	12	12	12
n-metallic mineral ducts	55	57	51	107	4	3	3	3
tal and engineering ducts	763	807	856	970	23	26	26	26
nufacturing of electrical chinery	308	355	374	451	12	14	14	15
ther, rubber and micals	396	429	434	495	12	14	14	16
nufacture of other c. of transport ipment	393	395	487	555	15	16	16	17
neration of transmission electrical energy, and water supply	21	21	18	21	6	5	5	5
cellaneous	201	215	200	219	7	7	7	7
al	2984	3193	3402	3917	141	153	153	161

l not be out of place to mention here that mber of people who have migrated to Delhi gaged themselves in unorganised produc- d service activities known as the 'informal It has also been observed that growth of ment in the informal industrial sector has lace at a much faster rate than the growth in nised sector i.e. formal sector in Delhi. In its contribution to employment generation the limited scope for expansion of employ- the organised sector, the informal sector be neglected and allowed to remain outside view of planning.

lability of water and power at cheaper rates in lson with the rates in other parts of the added with availability of other infrastructu- ties at satisfactory levels and, prevalence of axation rates are the main factors which have d a large number of entrepreneurs to Delhi in t two decades. Locational aspects of industry play a significant role as industrial locations directly influence the locational pattern of job opportunities in commerce, transportation, construction and other services. The decisions regarding industrial locations are based on availability of economic infrastructure. Thus, in order to decide locations of each and every individual industry in the Region, extensive growth potential surveys will need to be carried out.

There is a need to follow a well defined policy with regard to distribution and dispersal of industries in the Region so as to harmonise the development of the Region. To ensure achievement of this objective, a three tier system of policy of incentives and disincentives is proposed.

i. Strict Control within the Union Territory of Delhi

In the industrial growth of the Region as a whole, the industrial policy of Delhi would remain central. Industrial policy of the Government of India recog-

nises the need to prevent further concentration of industries around metropolitan cities, and the Government have been following the policy of not issuing new licences for further industrial activity within the Standard Urban Areas of the metropolitan cities. The first Master Plan for Delhi has prohibited certain types of industries, mainly large scale and obnoxious industries from being set up in Delhi, and this has been mainly responsible for the growth of only small scale industries generally manufacturing consumer goods of different kinds in Delhi. Keeping in view the spurt of industrial employment in the last two decades, there is a need not only to check large and heavy industries but also calls for a strict control in regard to even small scale industries. While continuing the present policy of not promoting location of medium and large scale industries within Delhi, location of even small scale industries to be restricted to those which employ 20 or less workers and are required either for providing or servicing the consumer needs of Delhi's population. All applications should be referred to a Special Group constituted by the Board for checking location of such industries.

All non-conforming industries which have been identified in the revised Delhi Master Plan should be shifted outside Delhi. A Committee should be set up for selecting alternate sites for shifting these industries within the Region.

ii. Control outside Delhi within DMA

The towns falling on the periphery of Delhi UT, also referred as Delhi Metropolitan Area towns viz. Faridabad, Gurgaon, Bahadurgarh, Ghaziabad and NOIDA have experienced a high rate of population growth and spurt in industrial activities. This might be due to the impact of Delhi's policy of discouraging some industries and disallowing others. It has also been felt that with the pace of industrial development in these towns during the last two decades, adequate level of residential, commercial and other related facilities have not been developed, which, on the one hand, has given rise to large scale proliferation of slums and on the other has enhanced commercial activities in Delhi. Due to lack of facilities, high and middle level executives employed in various industries prefer to live in Delhi, whereas, labour class has found shelter in the vicinity of these towns, giving rise to large scale slums around Delhi. Further growth of these urban centres to such a pace, alongwith establishment of obnoxious and pollutant industries may prove to be a deterrent factor from the environmental point of view in Delhi. It is, therefore, felt that alongwith Delhi, even in these towns, the location of industries creating problems of waste disposal, smoke, fumes, water pollution etc, should be discouraged. They are practically to be prohibited. As a policy, no employment intensive large scale industry should be permitted to be set up in Delhi and the Delhi Metropolitan Area. Only such small scale units which are essential for either feeding, servicing or maintaining Delhi and Delhi Metropolitan Area's population should be allowed in these towns.

iii. Incentive outside DMA within NCR

A policy aimed at providing alternative location of industries from urban Delhi and DMA towns to wider areas within National Capital Region in the medium sized regional towns and central place 'villages' and small towns where suitable infrastructure need to be provided, should be vigorously pursued. There should be consolidation of growth in the existing industrial towns, by improving the other sectors of the town economy, creating conditions under which industrial development can occur. New growth points should be created farther away from Urban Delhi so that a proper balance between the developed and undeveloped areas of the Region is achieved.

The industrial policy of the States of Haryana Rajasthan and Uttar Pradesh and Delhi UT be harmonised rendering the National Capital Region as an integrated Region. The participating State Governments within their own States should draw an industrial programme for development of the Sub-region keeping in view the optimum industrial development of the Region as a whole. Since the areas in these states are adjoining to the Union Territory of Delhi, the entrepreneurs which go for an alternate to Delhi are likely to be attracted to these areas. this way, State governments can take advantage their being near to the Capital. By such programme the State governments are likely to be benefited the long run.

b Policy Regarding the Location of Offices of Central Government and Public Sector Undertakings

Delhi is a multifunctional city serving as a magnet to all sections of society from not only the immediate region but the entire country. Delhi has shown spectacular growth in terms of employment. The major attraction here of course has been employment in the Government offices and pu

or undertakings which have been expanding fast to a change in status of this major metropolis an almost dormant colonial 'law and order' city at of the capital of a welfare State. Government dons have expanded rapidly to cope with add- ssential functions: foreign embassies, research cultural organisations and foreign missions have their distinct impact on the growth of the city. e employment in the various types of the rnment and quasi-Government offices has constantly increasing ever since 1921 (Table The employment in public sector can be divid- nder four major categories viz employment in Central offices, Delhi Administration, Local Bodies and quasi-Government undertakings. The employment in Central Government offices which was only 8000 persons in 1921 grew to 2.31 lakh persons in 1982. There has been a nominal increase in terms of numbers in the first two decades: it was only 1941 onwards that employment in Central Government offices took place. While comparing the employment of 1941 with the present employment, it may be seen that more than two lakhs new jobs have been created in this sector during the period just preceding the independence and the post independence period.

e 4.4 Employment in Public Sector in Delhi 1921-82 (Figures in lakhs)

Sector	1921	1931	1941	1951	1961	1971	1981	1982
Central Government	0.08	0.11	0.26	0.88	0.94	2.11	2.25	2.31
Delhi Administration	0.01	0.03	0.03	0.07	0.24	0.53	0.58	0.62
Local Bodies	0.02	0.01	0.12	0.11	0.33	0.90	1.09	1.13
Quasi-Government	N.A.	N.A.	N.A.	N.A.	0.06	0.56	1.41	1.51
Total	**0.11**	**0.15**	**0.41**	**1.06**	**1.57**	**4.10**	**5.33**	**5.57**

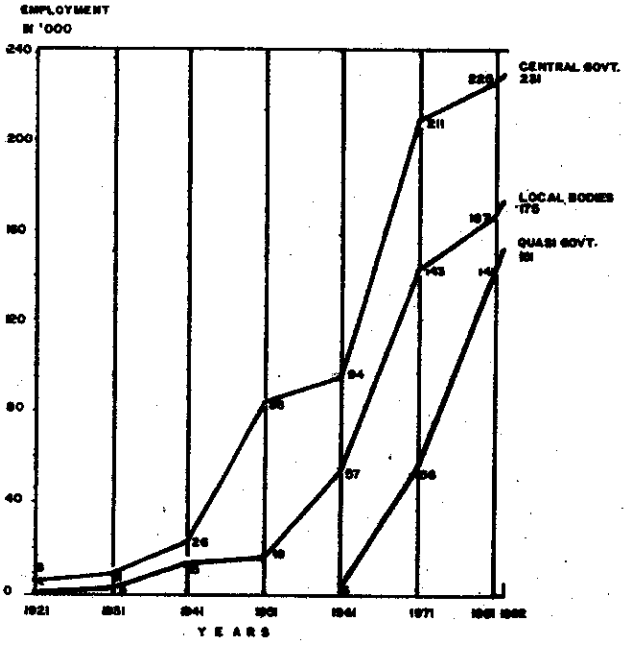
ls spectacular growth in Central Government e attributed to the fact that Delhi, once a tehsil e district, suddenly came into focus when it ne the capital of the second most populous ry in the world. For Delhi, in fact, it is Central rnment employment which made the base for activities to come up, and thus helped in acce- ng the growth to some extent. The alarming ion of 1.17 lakh jobs in Central Govenment oyment during the decade 1961-71 caused rn to the planners and the administrators, and in the sector of employment by way of def- g new job opportunities to other NCR towns counter-magnets was envisaged in the NCR Besides this, it was also considered to shift of the Central Government offices outside to the priority towns of NCR and the selected ter-magnets where some infrastructural faci- already exist. The Government of India, through Cabinet Secretariat, is aware of the need to k the proliferation of Central Government loyment in the Capital as apart from land for e space, land for housing and other facilities is ng costlier and the same can be provided more ply in the smaller cities over the country where an benefits and other services are available.

The employment in Delhi Administration and local bodies largely grew with the size and enhanced responsibilities of the administration and the local bodies with increasing overheads of servicing of metropolitan city. In 1921, it had a meagre 3000 persons employment which grew to 1.62 lakh persons in 1982.

The employment in Government undertakings in Delhi poses an alarming situation. The employment was only 6000 persons in 1961 which grew to 1.51 lakh persons in 1981 adding nearly 1.45 lakh persons in just two decades. In the decade 1971-81, above one lakh persons sought jobs in these undertakings, which means an addition of roughly 5 lakh persons during the decade 1971-81 by employment in Public Sector Undertakings. During the year 1981-82, 10,000 persons were employed in this sector in Delhi. Employment trend in public sector offices from 1921 to 1982 is illustrated in Figure 16.

Most of these quasi-Government offices and undertakings have their projects and field offices operating in far flung areas of the country. Although they face problems with regard to exercising supervision and control over these units while sitting in Delhi but in the name of performing liaison function and to avail superior infrastructure facilities,

Figure 16 Employment in Public Sector 1921-82



these undertakings, instead of operating a small liaisoning unit in Delhi, overlooking the costlier living and scarcity of space for office establishments and housing needs in Delhi, have established their huge offices in Delhi. These undertakings operate on commercial basis and are in a position to seek built-up space for office and housing from open market. The result is that Public Sector Undertakings are growing at a very rapid rate and making heavy demands on city services and facilities. The employment in these undertakings which was negligibly small in 1961 in comparison to Central Government employment, is now expected to supersede if this pace continues. From the growth trends of employment in Public Sector in Delhi, it can be said that employment in Central Government, Delhi Administration and Local Bodies is showing somewhat stablised or constant trends whereas employment in quasi-Government activities forsees a still high rate of growth.

The overall employment in Delhi in the year 1981 was 5.33 lakh persons. Taking the average size of a family as five with one earning member, the total population generated by this sector works out to about 26.65 lakh persons which comes roughly to 45% of the total population of Delhi UT.

The accelerated growth of population in Delh during the last three decades has to be kept withi manageable limits. The urbanisation process may however, needs to be rationalised by dispersing vari ous economic activities especially that of Gover ment Sector away from the metropolis. Amon other measures to be taken, it is imperative tha there should be a curb on the expansion of the exist ing Central Government and quasi Governmen offices and specially on the creation of new offices i the Capital. This is essential not only for the efficien functioning of the metropolis but also in the large interest of the development of the other towns o the Region. Decentralisation of the Governmen offices is an urgent and continuing task and shou be pushed through consciously.

To ensure that Central Government offices ar Public sector Undertakings do not add to furth employment, a three tier system of policy is pr posed:

i. Strict control within the Union Territory Delhi.

With regard to Government office, the prese policy and mechanism for screening the location new government offices and expansion of existi government offices should be continued. The ma criterion for location of offices in the Capital sho be that they perform Ministerial functions, proto functions or liaison functions which, by their natu cannot be performed anywhere else except in t National Capital. The existing offices which do n perform any of the above functions should be sh ed from Delhi. The jurisdiction of the Committ which already exists in the Govenment of India scrutinising and screening the opening of n Government offices and expansion of Governm offices in Delhi should be enlarged to include public sector offices. The Committee should furt identify those public sector offices or parts of th offices whose location in Delhi is not justified view of the aforesaid criteria.

ii. Control outside Delhi but within the DMA

A similar control on the opening of new cen government and public sector offices in the DM towns should be exercised. Relocation or expans of government offices which have ministerial, pro col or liaison functions which make it incumb upon them to be located in Delhi should be enc raged to be located in the DMA towns.

In so far as public sector undertakings are con-ned, the restrictions on their opening new offices expanding the existing ones should apply equally the DMA also. However, relocation of those ices whose existence or continuance in Delhi is ified may be encouraged to be in Delhi towns.

Incentives outside DMA but within NCR

The Central Government offices which are con-d for shifting from Delhi and DMA towns ld be located in other towns of NCR and incen- In the form of CCA, HRA, etc. as given to loyees working in Delhi, should also be given to employees. A higher order of linkage of road, nd telecommunication facilities should also be loped between other towns and Delhi.

he Public sector undertaking offices which deal northern region and are functioning in Delhi, function in a better way at a place in the centre of h India. These offices need not be located in . Such offices of the northern region should be d in the other towns of NCR.

olicy regarding the location of istributive Trades

butive trades in Delhi is one of the basic acti- the city. This has been facilitated due to termining factors which have been favour- Delhi and given it dominance over the) The spatial location of Delhi in relation to and communication network in the) The resources available in Delhi and its and 3) The functional specialisation of lhi being the centre of political and admi- power, the concentration of banking acti- owns, transport and communication facili- ing marshalling yards have all combined to growth of wholesale trade in Delhi, which as the third biggest distributive centre in y, next to Bombay and Calcutta.

1, Delhi had 22.8% of its working force in commerce which was second to the ser- r. In 1961, however, trade and commerce rd in the order next to other services and . The percentage of workers in this sector to 19.3%. However, the total number of creased from 1,17,338 to 1,43,809 during . Again in 1971, the proportion of workers nd commerce increased to 21.6%. The net during the decade was 95,910 persons which is more than three times the increase during the decade 1951-61. As per 1981 census figures, in trade and commerce sector, 4,13,430 peopel were working which is about 22% of the total working force. The number of workers in trade and commerce sector has almost doubled during the decade 1971-81 (Table 4.1).

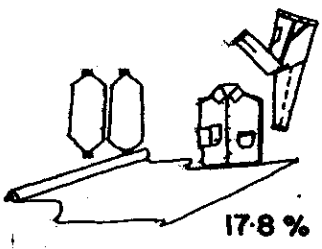
Most of the distributive trades in Delhi have been established in 19th and 20th centuries and are located in Old Delhi area, where the majority of the markets are located in close proximity to one another. This may be mainly due to the fact that they had to be located close to the Delhi railway station. This has the advantage that an outsider who comes to Delhi to buy three or four kinds of commodities needs to move only within a small area and make purchases.

According to the information gathered through the Wholesale Merchant Association in 1981, there were about 24,600 wholesale establishments in Delhi. During an exercise undertakne by the Perspective Planning Wing of the Delhi Development Authority in 1981, while preparing second Master Plan of Delhi, it has been revealed that out of the total 12,000 commodity handling shops surveyed, the largest number of 2142 shops ie 17.8% are in textile and textile products. The other major commodities are auto-motor parts machinery (1965 shops ie 16.3%), fruits and vegetables (858 shops ie 7.1%), hardware and building material (659 shops ie 5.5%) and paper, stationery and books (590 shops ie 4.9%). Table 4.5 provide the details and Figure 17 depicts the picture in respect of major wholesale shops in Delhi as of 1981.

The goods for many of the wholesale trades come to Delhi from all over the country. The very fact that Delhi emerged as the biggest consumption centre in whole of North India has made it a big distributive centre also. Due to its strategic location in North India with regard to transportation facilities, almost every wholesale trade generated from North India finds its base in Delhi. The area of distribution also covers a wide field. It is not confined to Delhi and the National Capital Region but extends over the whole of North India and even for some commodities over whole of India. (Table 4.6).

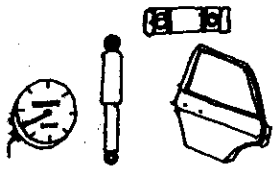
The major part of the commodities which are brought to Delhi is distributed outside Delhi. A survey conducted in 1981 with regard to distribution of wholesale commodities outside Delhi has revealed that percentage of exports outside Delhi, in some of the commodities like textiles and textile products, radio, TV parts, fruits and vegetables, electrical and

Figure 17 Delhi: Major Wholesale Shops by Commodities



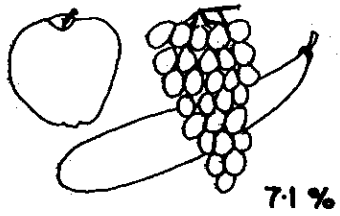
17·8 %

TEXTILE & TEXTILE PRODUCTS



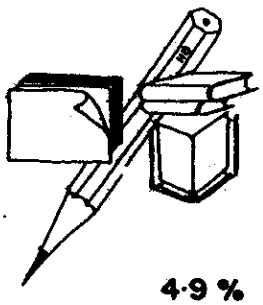
16·3 %

AUTO PARTS & MACHINERY



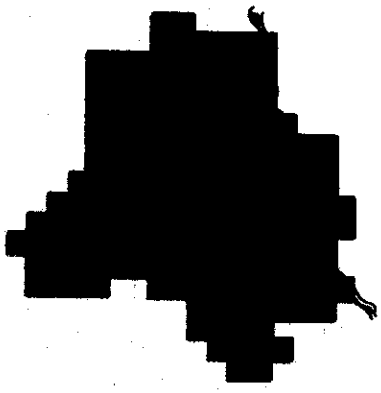
7·1 %

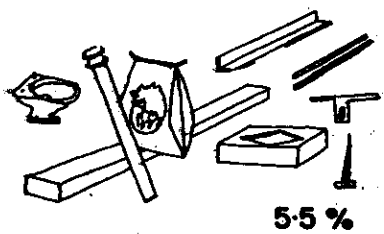
FRUITS & VEGETABLES



4·9 %

PAPER STATIONARY & BOOKS





5·5 %

HARDWARE & BUILDING MATERIAL

Table 4.5 Wholesale Shops by Commodities in Urban Delhi 1981

No.	Commodity	No.of	Page
1.	Textiles & textile products	2142	17.8
2.	Automotor parts and machinery	1965	16.3
3.	Fruits and vegetables	858	7.1
4.	Hardware and building material	659	5.5
5.	Paper stationery and books	590	4.9
6.	General merchants and Kiryana	541	4.5
7.	Iron and steel	423	3.5
8.	Bicycles, tyres and tubes	411	3.4
9.	Electrical and electronics	405	3.4
10.	Chemicals	365	3.1
11.	Rubber and plastic goods	383	2.8
12.	Scrap material (Kabari)	319	2.7
13.	Hosiery	299	2.5
14.	Leather, fur, skin and woollen products	289	2.4
15.	Other metal products	268	2.2
16.	Timber and plywood	263	2.2
17.	Food grains	252	2.1
18.	Other food material	230	1.9
19.	Radio, TV parts and accessories	209	1.7
20.	Cosmetics and toiletories	201	1.7
21.	Furniture and fixture	185	1.5
22.	Dry fruits and spices	148	1.2
23.	Crockery and utensils	126	1.1
24.	Oil, ghee, etc.	110	0.9
25.	Footwear	71	0.6
26.	Pan, Beedi, Cigarette	69	0.6
27.	Watch, Clock, Opticals	47	0.4
28.	Fodder and straw	34	0.3

4.6 Distributive Trades in Delhi–Origin and Destination of Commodities 1969

Distributive trades	Procurement area	Distributive area
Fruits and Vegetables	Afghanistan, Jammu & Kashmir, Haryana, Punjab, Uttar Pradesh, Bombay, Rural Delhi, Jaipur, Himachal Pradesh, Andhra Pradesh	Delhi Metropolitan Area, Kanpur, Lucknow, Bareilly, Northern and Southern India.
Foodgrains(Coarse)	Haryana, UP, MP, Rajasthan, Punjab	Delhi, MP, UP, Bihar, Maharashtra, Gujarat, West Bengal, AP, Kerala, Madras, Mysore.
Wheat and rice	Haryana, UP, MP, Rajasthan, Punjab	Delhi.
Fodder	Haryana, Punjab, MP, Rajasthan.	Delhi, UP, Rajasthan, Bihar.
Cloth	Bombay, Ahmedabad, Indore, Kanpur, Delhi, Modinagar, Punjab.	Punjab, Haryana, Rajasthan, HP, UP, MP, Bihar, Orissa, Assam West Bengal, Delhi.
Bicycles, Tyres and Tubes	Bombay, Calcutta, Kerala, Madras, Bengal, Sonepat.	UP, MP, Assam, Haryana, Punjab, Bombay, Delhi.
Dry fruits, Spices, Herbs, etc.	Iran, Afganistan, J&K, UP, MP, S.India, Maharashtra, Gujarat.	Delhi and area of 200 miles radius, J&K, Western UP, Rajasthan, Haryana.
Hosiery	Delhi, Calcutta, Kanpur, Ludhiana, Bombay.	Delhi, Punjab, HP, MP, UP, Bihar, Rajasthan, Kashmir.
Timber	MP, HP, J&K, Maharashtra.	Delhi, Punjab, UP, Haryana, Rajasthan
Cotton	Hissar and other districts of Haryana	Delhi, Uttar Pradesh
Iron scrap and junk	COD Cantt., Delhi, Rly. Depot. Shakurbasti and such other depots throughout India	Delhi, Punjab, Haryana, Rajasthan, UP, MP.
Old motor parts and machinery.	Delhi, Bombay, Allahabad, Kanpur	Delhi, Punjab, Haryana, Rajasthan, UP.
Iron and steel	Hindustan Steel TISCO, ISCO, Calcutta, Chandigarh, Faridabad	Delhi, Rajasthan, UP, Punjab, Haryana.
Hardware	Delhi, Calcutta, Bombay	Delhi, Punjab, Haryana, UP.
Furs, Skins and Wool	Delhi, Rajasthan, Punjab, Jaipur, UP.	Europe, America, Russia, Madras, Panipat, Delhi
Glass sheets	Faridabad, Calcutta, Ahmedabad.	Delhi, Punjab, Haryana, Rajasthan, UP.
Oil	–	–
Electrical goods	Delhi, Bombay, Calcutta, Patna, Kanpur	Haryana, UP, HP, Punjab & neighbouring areas.
Radio Darts	Delhi, Faridabad, Hyderabad	Delhi, Western UP, HP, J&K, MP, Haryana, Punjab, Rajasthan.
Films	Bombay, Madras	Delhi, Uttar Pradesh
Medicines	Bombay, Calcutta, Madras, Delhi	Delhi, Rajasthan, UP, HP, J&K, Punjab
Surgical instruments	Jullundar, Delhi, Meerut, Ambala	All-India.

2.4
2.2
2.2
2.1
1.9
1.7
1.7
1.5
1.2
1.1
0.9
0.6
0.6
0.4
0.3

tic goods, chemicals, cosmetics and toileto- fruits and spices, surgical and scientific ins- are as high as 80% (Table 4.7 and Figure

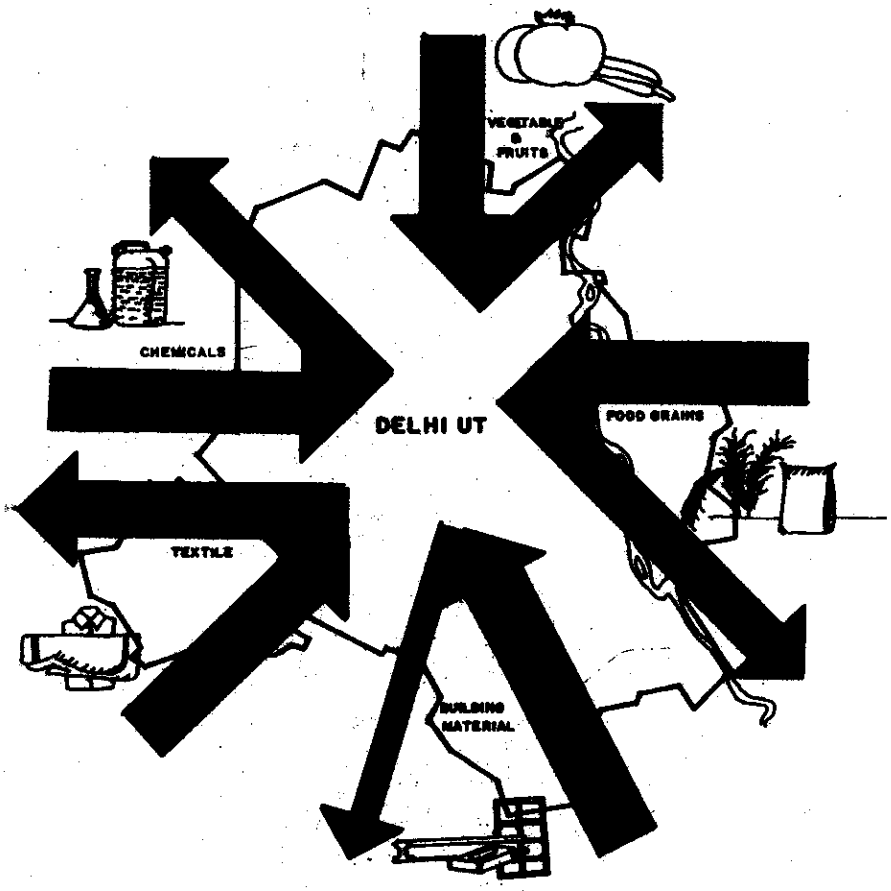
wo important aspects which are to be consi- while highlighting the distributive trades of : (i) The concentration of wholesale activity l city has grown in an unplanned manner resulted in congestion, encroachment on nd, traffic bottlenecks and parking prob- lems, besides causing excessive noise in the area, reducing the quality of life of the resident popula- tion; (ii) Due to strategic location and importance of Delhi and since the concentration of trade and com- merce activities have taken place in Delhi, a regional imbalance has been created. The towns of the Region are lacking in economic activities for want of sound economic base. Their growth has not been upto the level that would divert the growth of popu- lation from Delhi.

Table 4.7 Distribution of Wholesale Commoditie by % Exports outside Delhi 1981

S.No.	Commodity	% Export outside Delhi
1.	Textiles and textile products	95
2.	Radio, TV parts and accessories	90
3.	Fruits and vegetables	80
4.	Electricals and Electronics	80
5.	Chemicals	80
6.	Food grains	80
7.	Cosmetics and toiletories	80
8.	Dry fruits and spices	80
9.	Surgical and scientific instruments	80
10.	Leather, fur, skin and woolen products	78
11.	Bicycles, tyres and tubes	77
12.	Hosiery	75

S.No.	Commodity	% Export outsid Deli
13.	Watch, Clock, Opticals	7
14.	Petroleum products	7
15.	General merchants and Kiryana	6
16.	Rubber and plastic goods	6
17.	Other metal products	6
18.	Medicines	6
19.	Auto motor parts and machinery	5
20.	Paper stationary and books	5
21.	Furniture and fixtures	5
22.	Hardware and building material	4
23.	Timber and plywood	4
24.	Iron and steel	3
25.	Crockery and utensils	2

Figure 18 **Distributive Trades**



wholesale trade in Delhi is more regional in an local. It is, therefore, in the larger context al development and the necessity of limit- ation of Delhi to manageable limits and the avy investments to improve the condition trades and services, consideration has to be the shifting of some of these distributive the National Region alongwith such mea- decentralisation of Central Government d industrial dispersal in the Region.

ecting the trades suitable for decentralisa- criteria of permitting/developing facilities hose commodities which are directly used or consumed in Delhi should be adopted. All other commodities, majority of which are not directly used in the city be marketed from outside Delhi Urban Area and Delhi Metropolitan Area towns. A study of a few individual trades has been done. (Table 4.8). The study reveals that in cases of certain commodities, most of the bulk which is procured in Delhi is just exported outside Delhi and a very meagre portion is consumed in Delhi. The existence of these wholesale trades is not justified in Delhi. These trades can even function from other places efficiently provided reasonable infrastructure facilities are made available at these places.

Commodity-wise Good Movement by National Highway/Major Road in Delhi 1981

odity	NH-1		NH-2		NH-8		NH-10		NH-24		Loni		Total	
	In-ward	Out-ward	In-ward	Out-ward	In-ward	Out-ward	In-ward	Out-ward	In-ward	Out-ward	In-ward	Out-ward	In-ward	Out-ward
material	46	39	260	41	170	46	37	15	77	37	181	32	771	210
les	445	84	31	188	80	115	7	43	26	223	39	16	628	669
	58	76	115	50	100	140	76	21	110	37	32	6	491	330
Steel	10	82	175	41	45	9	12	12	62	31	–	7	304	182
	10	23	38	6	35	23	99	–	11	149	–	7	193	208
	68	146	68	51	194	162	42	58	190	179	16	20	578	616
	2	30	54	4	10	9	–	12	78	–	–	–	144	55
material	33	65	139	65	111	50	13	30	84	94	8	26	388	320
dities Misc.	22	157	121	125	157	106	117	36	125	242	16	21	558	687
	694	**692**	**1001**	**571**	**902**	**660**	**403**	**227**	**765**	**992**	**292**	**135**	**4055**	**3277**

o achieve the objective of harmonised t of the Region as such and to curb ressure on Delhi, restructuring the eco- Region by way of relocating the distri- of Delhi in the various towns of Nati- Region and the counter-magnets is three tier approach in this direction is be adopted.

ntives within Delhi.

ch of disincentives to the whole-sale are not directly consumed in Delhi opted. Only those wholesale trades ctly used and consumed in Delhi and rdous in nature and do not require ce should be allowed to continue and Delhi.

lled development outside Delhi within olitan areas.

The policy of checks and disincentives also to be followed in case of Delhi Metropolitan Area towns but with some restrictions.

The wholesale trades which are directly used and consumed in Delhi and Delhi Metropolitan Area towns should only be allowed. There are certain wholesale trades in Delhi which are hazardous because of their location in congested areas and due to bulk handling activities such as plastic and PVC goods, chemical, food-grains, iron and steel and timber and building materials. These wholesale trades should be encouraged to develop in Delhi Metropolitan Area towns.

iii. Outside Delhi Metropolitan Area within NCR

It is porposed that as a matter of policy, incentives, concessions and infrastructure should be made available in the regional towns to encourage and accelerate the growth of trade. New trade functrions with high growth potential functions should

necessarily be located outside Delhi and Delhi Metropolitan Area to create new growth foci.

A study with regard to inward and outward movements of certain commodities in Delhi along the National Highways and major roads has been done by Delhi Development Authority in 1981. The study also helps in identifying the areas from where these commodities are procured and distributed. Suggesting locations of the distributive trades in different towns of National Capital Region requires survey on potentialities of the towns and their economic linkages with Delhi.

This also envisages re-routing of the commodities in the new wholesale markets and the pattern of their distribution. Extensive studies in this regard with respect to each and every trade will have to be undertaken in depth before taking final decisions. However, based on the studies carried out as aforesaid and the suggestions given in earlier NCR Plan, some of the tentative locations for following distributive trades outside Delhi and DMA are as follows:

Cloth trade	:	Modinagar, Meerut, Rohtak, Alwar
Bicycle trade	:	Sonepat, Rewari
Fruits & Vegetables	:	Meerut, Alwar, Sonepat
Motor parts & Machinery	:	Meerut, Alwar
Dry fruits, Spices and Herbs	:	Khurja, Rohtak, Alwar
Hosiery	:	Panipat, Meerut
Iron and Steel	:	Alwar
Fuel oil	:	Meerut, Alwar
Foodgrains	:	Hapur, Meerut, Rewari, Alwar, Khairthal
Timber	:	Alwar, Baraut
Furs and Skins	:	Alwar, Panipat
Fodder	:	Rohtak, Khurja
Pulses	:	Khurja, Rewari, Hapur, Khairthal

GIONAL LANDUSE

5

egional Land Utilisation

the National Capital Region, agriculture is the minant user of land and covers 80% of the eporting area. The area under the category of ut to non-agricultural uses which include built ea, roads and water bodies, constitutes about f the Region's area (Tables 5.1, 5.2 and Fig. 19).

5.1 Land Utilisation in NCR 1981-82

	Sub-region				
	Delhi UT	Haryana	Uttar Pradesh	Rajas-than	NCR
able	0.97	2.94	2.08	2.35	2.65
tion ut to ficul- e nd ted	24.51	9.67	11.09	4.73	9.85
ti-	12.68	1.61	3.90	13.47	4.35
zing	0.54	0.94	0.43	2.70	1.44
crops	0.77	–	0.51	0.02	0.10
aste	0.58	1.45	2.54	1.69	1.56
ow	22.10	2.83	2.15	2.41	3.75
low	–	–	2.29	4.72	1.00
n	37.85	80.56	75.04	67.92	75.55
	100.00	100.00	100.00	100.00	100.00

er Agriculture

ow and fallow lands together consti- ultural land. In 1981-82, out of the total

Fig-19. Land Utilisation 1981-82
Sub-Regionwise

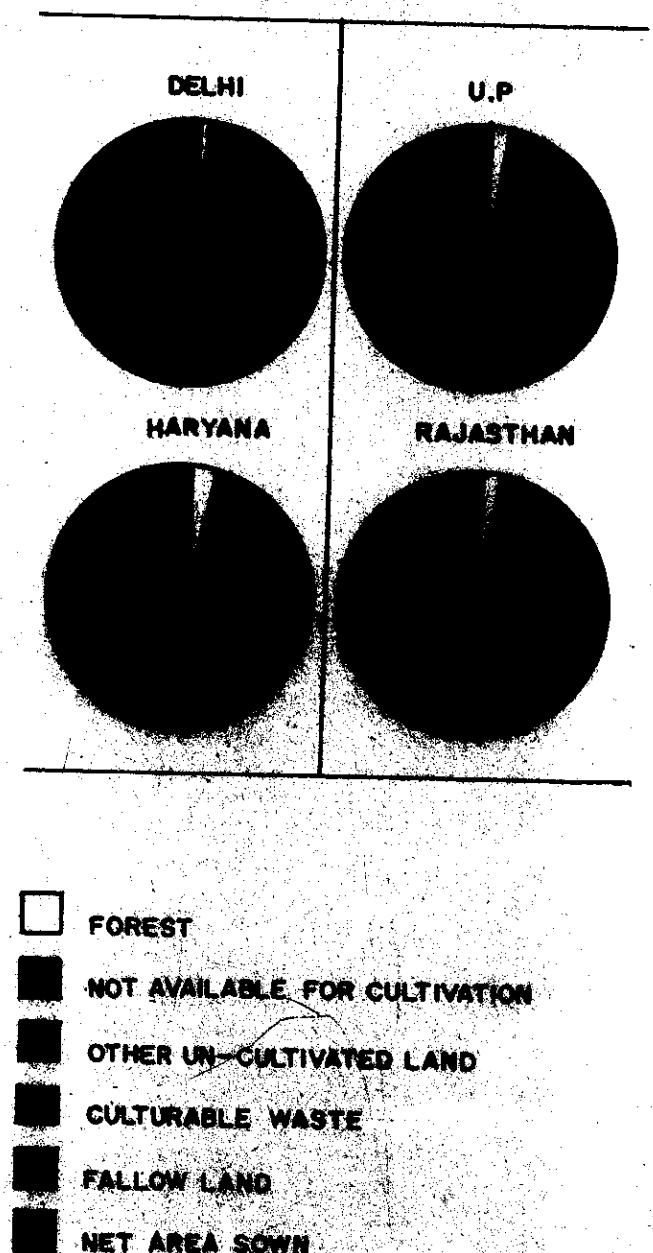


Table 5.2 Land Utilisation in NCR by Constituents : 1981-82

(Area in hectares)

Distt./ Tehsil	Reporting area	Forest	Not available for cultivation		Other un-cultivated land		Culturable waste	Fallow land		Net sown area
			Land put to non-agricultural use	Barren and uncultivated land	Permanent pastures & other grazing land	Land under misc. trees, crops and groves		Fallow other than current fallow	Current fallow	
I. U T of Delhi	149788	1434 (0.97)*	361439 (24.51)	18707 (12.68)	793 (0.54)	11.37 (0.77)	856 (0.58)	32589 (22.10)	—	[illegible]
II. Haryana sub-region	1800000	53000 (2.94)	174000 (9.67)	29000 (1.67)	17000 (0.94)	—	26000 (1.44)	—	51000 (2.83)	145000 ([illegible])
1. Gurgaon	279000	12000 (4.30)	40000 ([illegible])	5000 (1.80)	2000 (0.72)	—	—	—	18000 (6.45)	[illegible]
2. Faridabad	213000	4000 ([illegible])	[illegible]	8000 (3.70)	3000 (1.40)	—	—	—	1000 (0.70)	[illegible]
3. Mahendragarh	321000	8000 ([illegible])	[illegible]	10000 (3.10)	4000 (1.25)	—	—	—	3000 (0.95)	[illegible]
4. Panipat**	394000	14000 (3.55)	[illegible]	2000 (0.50)	6000 (1.52)	—	2000 (0.54)	—	14000 (3.55)	[illegible]
5. Rohtak	374000	[illegible]	[illegible]	2000 (0.53)	—	—	14000 (3.75)	—	8000 (2.14)	[illegible]
6. Sonepat	219000	8000 (3.65)	[illegible]	2000 (0.91)	2000 (0.91)	—	10000 (4.57)	—	7000 (3.20)	[illegible]
III. U.P. Sub-region	304362	6333 (2.08)	33716 (11.08)	11875 (3.90)	1302 (0.43)	1551 (0.51)	7731 (2.54)	6497 (2.15)	6971 (2.29)	[illegible]
1. Meerut	14477	829 (5.73)	1544 ([illegible])	432 (2.98)	34 (0.23)	6 (0.04)	223 (1.54)	272 (1.88)	394 (2.72)	[illegible]
2. Mawana	19721	[illegible]	[illegible]	166 (0.84)	—	—	—	139 (0.71)	161 (0.82)	[illegible]
3. Sardhana	[illegible]	[illegible]	[illegible]	162 (0.93)	73 (0.42)	32 (0.18)	107 (0.61)	101 (0.58)	407 (2.34)	[illegible]
4. Baghpat	[illegible]	[illegible]	[illegible]	364 (2.08)	4 (0.02)	5 (0.03)	62 (0.35)	217 (1.24)	215 (1.23)	[illegible]
5. [illegible]	[illegible]	[illegible]	[illegible]	626 (2.75)	52 (0.23)	178 (0.78)	132 (0.58)	178 (0.78)	[illegible]	[illegible]
6. Khurja	28692	[illegible]	[illegible]	2296 (8.00)	77 (0.27)	407 (1.42)	[illegible]	392 (1.37)	[illegible]	[illegible]
7. Sikandrabad	37230	[illegible]	[illegible]	2605 (7.00)	803 (2.16)	295 (0.80)	[illegible]	791 (2.10)	[illegible]	[illegible]
8. Anupsahar	28354	[illegible]	[illegible]	599 (2.11)	39 (0.14)	85 (0.30)	[illegible]	485 (1.72)	[illegible]	[illegible]
9. Ghaziabad (Loni)	28226	[illegible]	[illegible]	[illegible]	19 (0.07)	91 (0.32)	[illegible]	[illegible]	[illegible]	[illegible]
10. Garhmukteswar	33841	[illegible]	[illegible]	[illegible]	—	226 (0.67)	[illegible]	[illegible]	[illegible]	[illegible]
11. Hapur	[illegible]	[illegible]	[illegible]	[illegible]	2 (—)	116 (0.41)	[illegible]	[illegible]	[illegible]	[illegible]
12. Dadri	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
IV. Rajasthan sub-region	[illegible]	[illegible]	[illegible]	[illegible]	11825 ([illegible])	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1. Alwar	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Contd.

(Area in hectares)

	Reporting area	Forest	Not available for cultivation		Other un-cultivated land		Culturable waste	Fallow land		Net sown area
			Land put to non-agricultural use	Barren and uncultivated land	Permanent pastures & other grazing land	Land under misc. trees, crops and groves		Fallow other than current fallow	Current fallow	
ar	59351 (57948)	6 (*)	2953 (4.98)	8154 (13.75)	2663 (4.50)	8 (–)	1229 (2.00)	3666 (6.20)	2184 (3.70)	38488 (64.85)
	72971	228 (0.30)	2681 (3.67)	6743 (9.24)	3123 (4.28)	2 (–)	180 (0.24)	1428 (1.96)	5129 (7.08)	53457 (73.26)
	74775	1127 (1.50)	3563 (4.75)	9925 (13.25)	848 (1.30)	9 (–)	585 (0.78)	1271 (1.70)	3584 (4.80)	53863 (72.00)
	63555	472 (0.75)	2770 (4.36)	10173 (16.00)	364 (0.57)	29 (0.50)	1817 (2.86)	1087 (1.71)	4222 (6.64)	42621 (67.06)
	57324	380 (0.70)	1854 (3.23)	6870 (11.88)	2430 (4.24)	– –	271 (0.47)	637 (1.11)	1630 (2.84)	43252 (75.45)

rackets indicate percentages to total reporting area
s Karnal District
Statistical Abstract of Haryana 1982-83
Statistical Abstract – Bulandshahr, Meerut and Ghaziabad District of Uttar Pradesh
Statistical Abstract – 1981 – Rajasthan

about 76% was reported as net sown
wn area is highly concentrated in the
egion where 80.56% of the total
s under this category and, Delhi con-
st concentration (37.85%). Delhi has
ntration of fallow lands constituting
ng area the least (2.8%) being in the
on. Fallow lands can be brought
by providing irrigation facilities.

ltivable waste and Other

lands constituted 1.56% of the
Uttar Pradesh has the highest
of cultivable waste. The area
vated land constitutes 1.54%
lhi has the highest concentra-
of land.

for Cultivation

es land put to non-agricultural uses such as built up areas, areas under transport net-work and water bodies. Delhi has the highest concentration of land (37.19%) under this category and the Haryana Sub-region the least of 11.28% of the reporting area. The proportion of barren and uncultivated lands is the highest in the Rajasthan Sub-region. Delhi has more than 12% of the total reporting area and the other constituent areas have relatively much less area under this category. The land not available for cultivation is increasing at an alarming rate mainly due to urbanisation. The rational use of land for non-agricultural purposes thus becomes a matter of primary importance.

d. Land under Forests

Forest forms a meagre proportion of the total reporting area in the Region constituting only 2.65%. The forest is concentrated in Alwar tehsil of Rajasthan Sub-region and some stretches along the Ganga river in the Uttar Pradesh Sub-region.

5.2 Landuse: A Regional Perspective

Land use characteristics

Two main factors are responsible for the change of the landuse characteristics in the NCR. The first has been the continuous rapid increase in economic activity in Delhi Urban Area and the consequential rise in population within it mainly due to in-migration. In 1981, 63% of the total urban population of NCR lived in Delhi. This concentration of economic activity has led to population concentration in Delhi as compared to the rest of the Region.

The second factor has been the increase in the development of industries on the traffic arteries radiating from Delhi and the premature and speculative sub-division of land for residential and industrial purposes outside Delhi. Development of such industries along the traffic arteries and the great imbalance of social infrastrucutre in the DMA towns and low growth of other towns in the Region have characterised the present landuse demands in the Region.

The above development have had their effect on the pattern of urbanisation and employment trends. In 1981, the trends of urbanisation in and around Delhi indicated that out of the total population of 191.93 lakhs, nearly 48% lived in urban areas of which Delhi Urban Area accounted for about 30%. Thus, the Region is predominantly rural, both in population component as well as in its occupational structure with more than 50% of the working force employed in primary sector.

The dominant role of economic development of Delhi Urban Area has influenced to a large extent the present urban structure within the Region. The preponderance of Delhi's growth is reflected in its interlinkages with other centres, both within and outside the Region, and in the country as a whole. Thus, the road and rail routes converge on Delhi and diverge in the opposite direction for movement outside Delhi. This has resulted in flourishing wholesale market in Delhi for the entire North-Western India. This is reflected in the present disposition of landuse, with main urban centres along the arteries and to certain extent coming up of industrial agglomerations.

The perennial sources of water— the Yanuma and Ganga and their distributaries have shaped the agricultural economy of the Region with its concomitant development of rural settlements. The availability of fertile land and vast underground water resources and also irrigation schemes are bound to play a sig ficant role in the development of the rest of t Region.

5.3 Future landuse Trends in NCR

During the Plan period, the primary sector a agricultural economy will continue to form the m stay in the Region, although the urban structure the future perspective would continue to play m dominant role. The major employment opportu ties will continue to be in the primary sec although by dispersal of economic activity aw from Delhi, a different hierarchical order of urb centres will emerge which will increasingly prov employment opportunities in non-agricultural s tor.

The proposed Transport and Communicat system which signifies a new development strat based on the Radial Corridor Pattern provides key for rationalisation and re-organisation of l use in the Region. The urban centres along the co dors would create more employment in second and tertiary sectors thereby bringing about conc tration of urban population in these centres. Con quently, there will be a shift in the land requirem from non-urban to urban uses.

Apart from the above developments, there be development and investment in industries provide the necessary economic opportunities the anticipated urban population of 234 lakhs in Region. As a major aspect of the regional po these industrial areas are to be developed in selected priority urban centres. On this basis, requirement of land for industries will become a of the requirement of urban landuse.

5.4 Future Regional Landuse

a. Land for Agriculture

In view of the anticipated changes in land there would be a major impact on land requirem of the agricultural sector. To the extent that employment opportunities are proposed in agricultural sector and consequent concentrati new population, the existing urban expa would have to be met mostly from the existing cultural land. This obviously necessitates a rat policy of utilisation of less valuable agricultural and, as far as possible, un-productive or barren for urban expansion/new urban centres. The se

cause of change in the agricultural land would be on account of creation of lakes, reservoirs, flood protection works, urban water supply schemes and irrigation network within the Region. This calls for intensive utilisation of available agricultural land for production purposes; such land as well as that that would be reclaimed by flood protection have to be reserved for agriculture.

b. Land for Urban Centres

It has been proposed that out of the assigned population of 325 lakhs by 2001 A D, about 234 lakhs would be accommodated in the urban areas which accounts for 72% of the total population in the Region. In order to ensure balanced regional development, three targets have been proposed: i. Delhi Urban Area's (DUA) growth would be restricted to 110 lakh population; ii. dispersal of 37 lakh population in the towns in the Delhi Metropolitan area and iii. development of urban centres by way of location of industrial, commercial, Government offices and other employment opportunites to accommodate 87 lakh urban population outside the DMA. The major share of population would be borne by the selected priority towns. To accommodate the total 50 lakhs (Table 5.3) population in the selected 8 priority urban centres/urban complexes outside the DMA, a total land of nearly, 40,000 hectares would be required for urban expansion. Thus, the additional land of 20,000 hectares would accommodate the additional population of

Table 5.3 Land Requirement for Urban Development by 2001 in NCR

Town/Urban Complex	Existing Area in Ha.	Population 1981	Population Density —1981 Per Ha.	Assigend population —2001 in lakhs	Additional population to be accommodated (in lakhs)	Total land required in Ha.	Additional land required in Ha.
Priority town Urban Complex							
1. Meerut	8082	5.37	66	13.00	7.63	10400	2318
2. Hapur	583	1.03	176	6.00	4.97	4800	4217
3. Bulandshahr Complex	1975	1.70	86	10.00	8.30	8000	6025
(a) Bulandshahr							
(b) Khurja							
4. Palwal	552	0.47	85	3.00	2.53	2400	1848
5. Panipat	2082	1.38	66	5.00	3.62	4000	1918
6. Rohtak	2203	1.67	76	5.00	3.33	4000	1797
7. Rewari Complex	606	0.52	85	3.00	2.48	2400	1797
(a) Rewari							
(b) Dharuhera							
(c) Biwadi (in Rajsthan)							
8. Alwar	8000	1.46	18	5.00	2.54	4000	Nil
Sub-total I	24083	13.60	56	50.00	36.40	40000	19917
DMA Towns							
1. Ghaziabad including Loni	6840	3.00	44	11.00	8.00	8800	1960
2. NOIDA	600	0.75	125	5.50	4.75	4400	3800
3. Faridabad	17824	3.31	18	10.00	6.69	8000	Nil
4. Gurgaon	2413	1.00	41	7.00	6.00	5600	3200
5. Bahadurgarh	900	0.37	41	2.00	1.63	1600	700
6. Kundli	200	0.25	125	1.50	1.25	1200	1000
Sub total II	28777	8.68	30	37.00	28.32	29600	10660
Grand total (I + II)	**52860**	**22.28**	**42**	**87.00**	**64.72**	**69600**	**30577**

Note: Density assumed: 125 persons per hectare.

36.40 lakhs. It has been estimated that in DUA, the proposed addition of 53 lakh population could be accommodated in 17,000 hectares. Similarly, in the six DMA towns, the additional 28.32 lakhs can be accommodated in 10,000 hectares. Thus, it would be seen that, for accommodating about 120 lakh population, a total additional area of 47,000 hectares would be required by 2001. The land required for various development in the extended time frame of 2001, may be acquired from time to time. The additional land for urban extension of Delhi has been calculated based on the assumption that out of the assigned 110 lakh urban population, the present urbanisable limit of DUA would accommodate 82 lakh population by 2001 (as estimated by DDA) by judicious infill and selected modification of densities. The remaining 28 lakh population could be accommodated in about 17,000 hectares in the urban extension of DUA.

c. *Land for Regional Recreational Purposes*

Recreation as an amenity has to meet four competing types of demand: from the urban population of the Region using country side as an amenity, from a wide urban population coming to the Region for recreational purposes, from the agricultural community and from the physical development of the region itself.

The landuse policy on recreational areas will meet the demand in the following way:

a. Areas of genral level amenity as regional park in the proximity of the metropolis

b. River front 'as recreational areas' by developing them and making them more accessible for such use.

c. Historical monument as Tourist attraction

d. Parks in rural areas noted for their landscape and scenic beauty which could be used as picnic spots, and

e. National Park in the vicinity of the Region

5.5 Nature Conservation

The unplanned urbanisation and industrialisation and intensive exploitation of resources with little regard to environment affect the environment and ecology adversely. It has been realised that an intimate and in-separable relationship exists between the environment and development and that sustained development may not be achieved by ignoring the environmental causes.

To achieve the overall development of NCR without destruction of its natural environment, all economic activities need to be planned. Special attention should be given to check the damage to natural features and environment by man's interference for development purposes.

In NCR, the major natural features are the Ridge, an extended part of the Aravali range, the forest areas, the rivers Yamuna and Ganga. Apart from these, NCR has two wild life sanctuaries namely, Sariska Wild life Sanctuary in the Rajasthan Sub-region and Sultanpur Bird Santuary in the Haryana Sub-region harbouring a large number of wild animals and birds.

The ridge areas should be conserved with utmost care and should be afforested with indigenous species.

The existing forest areas should be conserved and more area, specially un-productive land, should be brought under tree plantation. Conservation of natural habitat and features in the Region is of great importance to sustain the natural eco-system.

The rivers Yamuna and Ganga have a high level of water pollution mainly from the untreated sewage and waste from industrial areas. Measures will be adopted to check such pollution to keep the rivers clean.

5.6 Buffer Zone

The development of land in NCR must be balance by positive consideration of the role of open land in the Region. The Plan aims to improve the physical environment of the Region. This will be achieved by ensuring that both existing uses within the Region and development proposals contemplated by proposals. The location of green buffer zone in between the growing towns will support the regeneration of the priority settlements/areas by controlling the growth of the built-up areas. Besides, the Green Buffer zone will prevent neighbouring settlements from merging and help to preserve their special character.

In NCR, the DUA and the DMA towns are growing at an alarming rate and gradually engulf the rural areas between the DUA and the six DMA towns. If the present trend continues, the DMA towns will merge with the DUA and form a continuous urban agglomeration which will lead to the level of megalopolis. To check this rapid expansion, it is essential to keep the buffer zone of 5 to 10 km wide. Similarly,

proposed urban complexes should be separated
each other by a buffer zone.
e buffer zone policies are designed to restrain
ncroachment of urban activities into the rural
. The permitted uses within the buffer zone are
dly agriculture, horticulture and forestry. In
there is a wide scope for agriculture to flourish
so, most of the buffer zones can be used for
sive agriculture. Besides agriculture, the deve-
ent of new outdoor recreational facilities or the
sion of such facilites can be permitted provid-
y meet the needs of nearby communities and
ricultural interests are protected. Mining acti-
nd brick kilns could be permitted in the buffer

Proposed location of the Buffer zone

e following are the proposed locations of the buffer zones. However, the detailed demarcation of buffer zone will be shown in the Sub-region's Land-use Plan.

i. Green Buffer zone of suitable width surrounding DUA which will prevent the DMA towns from merging with DUA
ii. The area between the urban areas of Ghaziabad and Loni
iii. The stretch along the NH – 2 between Faridabad-Ballabhgarh Complex and Palwal.
iv. The areas between Ghaziabad-Muradnagar, Modinagar and Meerut.
v. The areas around Bulandshahr and Khurja of proposed Bulandshahr-Khurja Urban Complex.
vi. Areas around Rewari-Dharuhera and also Dharuhera-Bhiwadi of proposed Rewari-dharuhera-Bhiwadi Complex.

TRANSPORT AND TELECOMMUNICATIONS

6

6.1 Conceptual Frame

National Capital Region Plan has been conceived to gain optimum growth of the Region through planned development and also to mould and refashion the Region both physically and economically, for a fuller realisation of wider and deep social values. Traffic system has been identified as one of the basic factors determining the type of development in terms of its spatial organisation and concentration. While existing transport network structure attracts further activities and envisages concentrated development, new lines would aid dispersal of activities and subsequently balanced development. This calls for a strategy to gain an organised transport network in conformity to the objectives to be attained in the National Capital Region. This Plan envisages the transportation sector to 'lead' development rather than to 'follow' and as such programmes envisaged are to be 'futuristic' rather than 'problem solving'.

The determinants that should form the base for such an organised transport structure are:

i. location of settlements in space with their volume of population – present and destined.
ii. probable activity centres wherein induced development is expected on intensified scale.

The approach adopted to evolve a viable settlement system in National Capital Region involves identification of a four tier system of settlements in which while the nearby same order centres would be linked directly, efforts would be to link the lower order centres with the nearby higher order centres. It envisages developing a few selected centres on an intensified scale which would form first order settlements irrespective of other settlements which may be identified later and selection/identification of such centres would be based on their ability to attract and accommodate greater volume of activities and population. Such centres identified are:

i. Meerut, Hapur and Bulandshahr – Khurja from Uttar Pradesh Sub-region.
ii. Panipat, Rohtak, Rewari-Dharuhera and Palwal from Haryana Sub-region, and
iii. Alwar and Bhiwadi from Rajasthan Sub-region

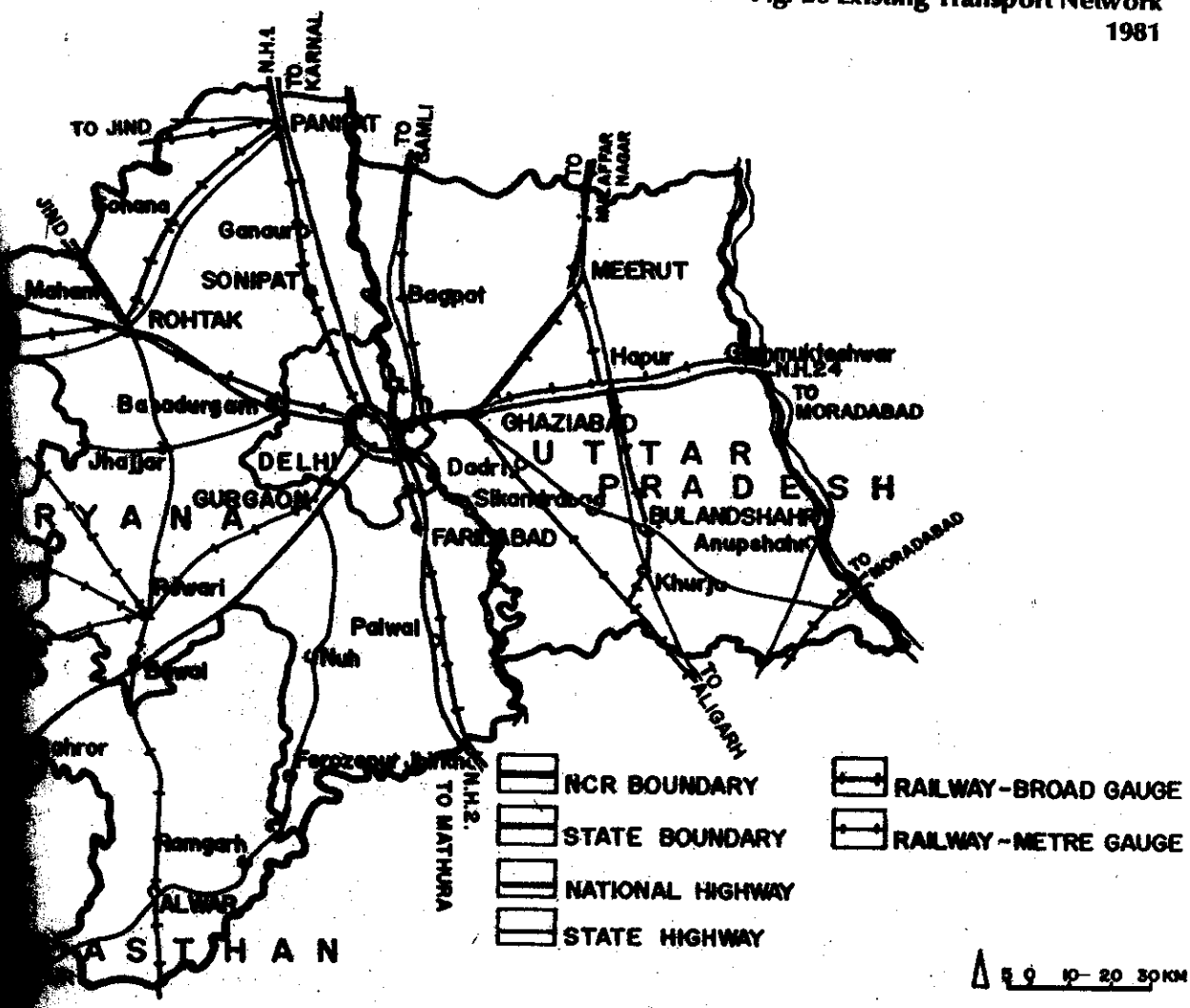
6.2 Existing Transport Network Structure

Transport development in National Capital Region has been essentially of corridor oriented. There are nine corridors (Table 6.1 Figs 20 and 21) in the National Capital Region which have formed the backbone of the Region. There has been a substantial increase in the volume of activities, work force and population along these corridors over the period and as such it is only logical that these activity and population attracting corridors are utilised to gain the prime objective of National Capital Region of controlling the growth of Delhi and encouraging or promoting regional towns by taking away such developmental activities to the distant regional towns.

Some of the salient features that could indicate growth trends of concentration along these corridors are presented in Table 6.1.

i. Though there has been a marginal reduction in the proportion of urban population in the corridor towns to total urban population of the Region, with 80.94% in 1981 concentrated along these corridors against 82.7% in 1961, in absolute sense, net increase in urban population along these corridors, is 190.5 lakhs which represents a growth of 174.85% during the period 1961-81.
ii. The corridors Faridabad-Ballabhgarh-Palwal-Hodal-Hathin-Hasanpur, Gurgaon-Jharsha-Pataudi-Bawal and Loni-Khekra-Aggarwal

Fig.-20 Existing Transport Network
1981



...di–Baghpat–Baraut–Tikri–Gohat–have ...ered substantial increase in terms of pro... of Region's urban population they ...umodate while in others there has been ...inal reduction in that proportion.

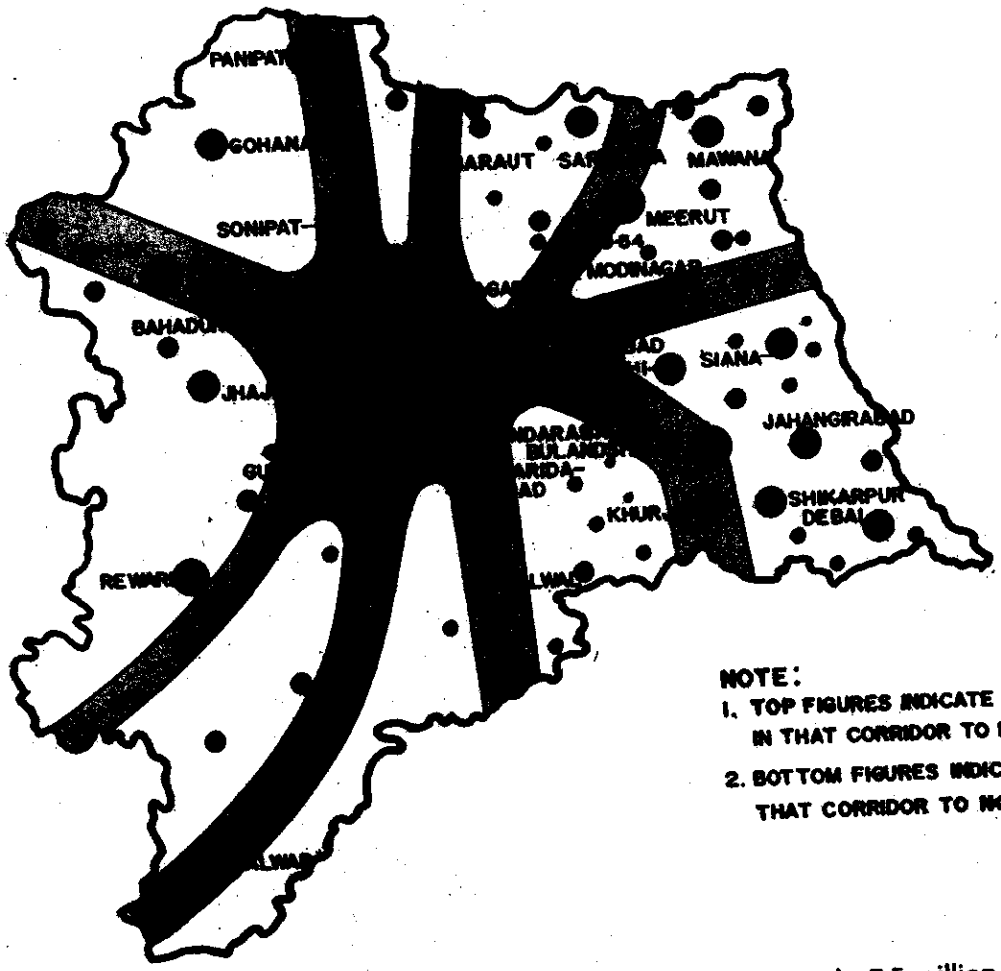
...though there has been a marginal reduc... the proportion of Region's urban work... force along these corridors, they have ... in absolute sense a total of 44.73 lakhs ...an force registering a growth of ...% during the period 1961-81 indicating ...cess volume of traffic that should be ... by the existing lines. Every increase in ...ork force volume results in associated ...d increase of dependent population. ...ing the concentration trend of total ...ation along selected corridors, concentration of working force also has been along Faridabad-Ballabhgarh-Palwal-Hodal Hathin-Hosanpur and Loni-Kekhra-Aggarwal Mandi-Baghpat-Baraut-Tikri-Doghat Corridors.

v. Concentration of work force in non-agricultural activities is higher among the corridors, Ghaziabad, Faridabad and Sonepat corridors. Volume generated by non-agricultural work force for transportation, in terms of service population and continuous goods traffic flow, need not be over emphasised.

6.3 Traffic flow characteristics in National Capital Region

Detailed traffic flow volume characteristics of the National Capital Region roads are yet to be studied.

Fig.-21 Urban Population and Work Force Concentration in trasnport Corridors 1981



At the Interim Plan level, it has been felt and decided that studies undertaken for 1973 NCR Plan could be taken as the base for determining the minimum requirements. Some of the details which have been collected while preparing 1973 plan or from various agencies recently, are given in the forthcoming paragraphs (Table 6.2). Regional transport for National Capital Region has been analysed in three parts i.e., i. Intra-urban transport for Delhi, ii. Transport facilities for Delhi Metropolitan Area and iii. transport facilities for the rest of the Region.

i. Intra urban Transport

The Delhi Urban Area extends from Mehrauli in south to Model Town in the north and Nangloy in the west to UP border in the east covering an area of 447.77 sp km with a radial distance of approximately 12 to 15 km in all directions. At present major traffic load is taken by roads ie, by buses and private vehicles. Nearly, 7.5 million passenger trips are carried by major roads of Delhi through private and public transport daily. Projection studies (by DDA) indicate that if no other mode of transport is developed, 12 million vehicular trips would be required to be carried by roads in 2001. The capacity of roads is limited and as such they would be incapable of taking traffic load beyond their capacity. Moreover, the time in journey to work place is increasing day by day due to more and more congestion on Delhi roads. As such, there is an urgent need to think over some rapid mass transport which may help in: i. decongesting the Delhi Urban roads, ii. lessening the journey time, iii. lessening the risk of accidents on roads, and iv. controlling the environmental and noise pollution.

ii. Delhi Metropolitan Area Transport

Delhi Metropolitan Area (DMA) has been desi

to comprise Delhi Union Territory, Faridabad-garh Complex, NOIDA controlled area, Gur-Bahadurgarh, Kundli and extension of Delhi n Haryana encompassing an area of 3182 sq ese surrounding towns are developing so fast ey tend to become a compact urban agglome- with Delhi and as such need transport facilities n provide fast and efficient interaction bet- hem and the Union Territory of Delhi. Delhi is

the converging point of seven railway lines and five National Highways. Unless strong measures are taken to reorganise the development pattern of the surrounding towns in National Capital Region and the regional railways and road-linkages, the converging existing transport routes will create chaotic conditions in Delhi. The peripheral towns of Delhi Union Territory such as NOIDA controlled area, Faridabad, Gurgaon, Bahadurgarh, Kundli, etc are deve-

6.1 Corridor towns in NCR with population and working force 1981

	Population in corridor towns (in 000's)	% to urban population of NCR	working force in corridor towns (in 000s)	% to urban working force of NCR	Work force in Non-agri. activities	% to urban Non-Agri-culture working force of NCR
bad-Muradnagar (OF) nagar-Modinagar- l-Meerut.	957.7	28.78	277.6	29.54	262.8	32.00
wa-Hapur-Babugarh- ukhteswar.	161.0	4.83	41.9	4.46	36.9	4.49
-Sikandrabad-Bulandshahr-	233.4	7.00	59.2	6.30	53.2	6.48
bad-Ballabhgarh-Palwal- l-Hathin-Hosanpur.	408.6	12.28	132.7	14.12	124.4	15.16
on-Jharsha-Pataudi-Bawal	125.4	3.76	31.9	3.40	30.8	3.75
-Nuh-Ferozepur-Jirka-Alwar.	173.8	5.22	46.5	4.96	43.2	5.27
durgarh-Rohtak-Megham-Kalanaur.	228.3	6.86	60.8	6.48	56.3	6.87
pat-Ganaur-Samalkha-Panipat	277.3	8.32	81.1	8.63	75.5	9.20
Khekra-Aggarwal Mandi (Tasiv)- pat-Baraut-Tikri-Doghat.	129.3	3.89	34.0	3.62	23.9	2.92
Total	**2995.1**	**89.94**	**766.0**	**81.51**	**707.5**	**86.14**

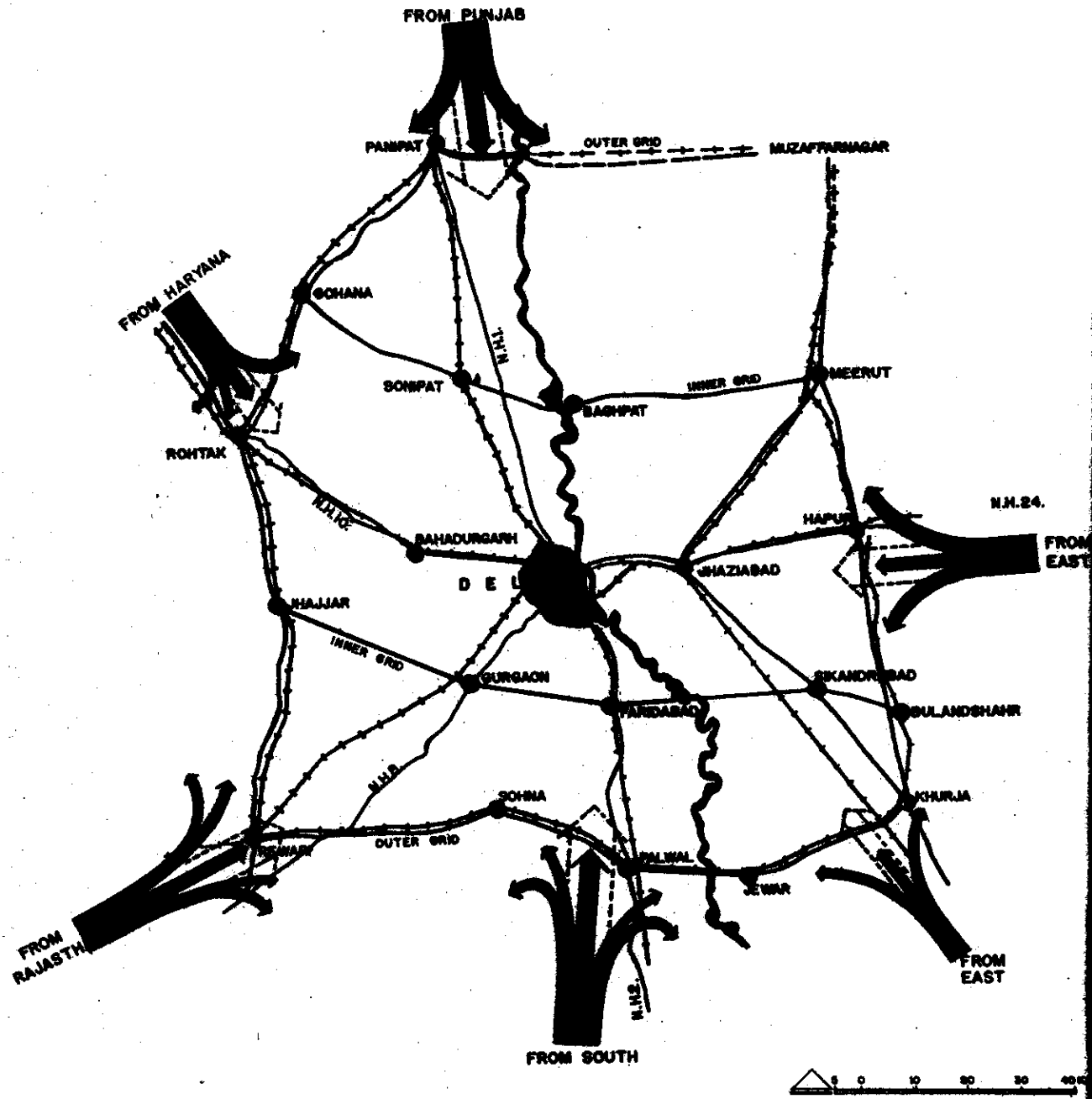
ng very fast. But as these towns neither have ing and unloading facilities at their railway sta- for regional movement of freight nor railway ons for regional movement of freight nor inter- nection through proper roads and railways ng each other, such developments would avate the problem. In addition, there is lack of quate booking facilities for passengers travelling in the National Capital Region or outside the tal Region. As such, one has to reach Delhi main ons for the movement of freight as well as for engers even if one does not have any business Delhi Urban Area. In other words, the traffic h can easily bypass Delhi has to pass through i roads and railway terminals crowding them ecessarily before it reaches its destination. The concept plan (Fig. 22) illustrates the direction of traffic flow from the surrounding areas into the NCR. About 7 to 8 lakh commuters and long distance travellers arrive and leave Delhi daily by three modes of transport ie, rail, road, and air.

iii. Movement on roads

a Passengers: Passenger movement by inter-state buses in the year 2001 – both incoming and outgoing has been projected to be 7,25,000 and the number of buses to be 14,000.

b Freight movement by roads: Table 6.2 and Figs 23 and 24 show the movement of commodities in and out of Delhi in 1981. It offers

Fig.-22 Concept Plan for Road & Rail Net Work



the following inferences:

i. Maximum movement of incoming trucks carrying building materials, ie., thorugh NH 2(260) trucks) and through Loni road (181 trucks). Out of total incoming trucks of 771, only 210 are outgoing ie, there is maximum consumption of building materials in Delhi.

ii. There are 628 trucks loaded with fruit and vegetables coming into Delhi (maximum through NH 1) and 688 are outgoing (maximum through NH 24). It shows that these fruit and vegetables are brought for distributio which come from north side in to Delhi an most of the loaded trucks passing throug Delhi are destined to Uttar Pradesh side.

iii. Out of 491 trucks of cereals coming fro

Fig-23. Goods Movement by National Highways-1981

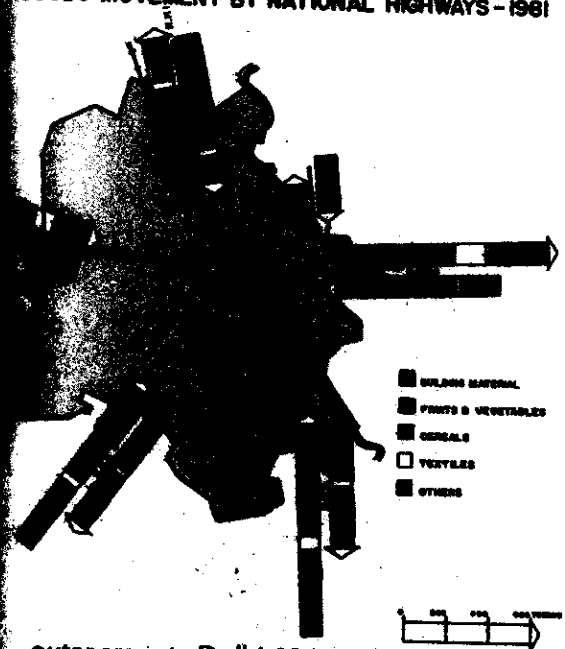


Fig-24. Freight Movement on Roads-1981

outer areas to Delhi, 330 trucks are going out. This shows that only 33% of the total cereals coming from outside is consumed in Delhi and 66% is meant for other areas of the Region that can easily bypass Delhi if facilities are available.

iv. Of the industrial raw material, 320 trucks out of 338 incoming trucks go out ie, 82% of the industrial raw material of the total incoming to Delhi is destined for outside DMA.

e 6.2 Commodity-wise goods Movement by National Highway/Major Road in Delhi 1981

(in truck loads)

Commodity	NH-1		NH-2		NH-8		NH-10		NH-24		Loni		Total	
	In-ward	Out ward	In-ward	Out ward	In-ward	Out ward	In-ward	Out ward	In-ward	Out ward	In-ward	Out ward	In-ward	Out ward
Building material	46	39	260	41	170	46	37	15	77	37	181	32	771	210
Fruits & Vegetables	445	81	31	188	80	115	7	43	26	223	39	16	628	669
Cereals	58	76	115	50	100	140	76	21	110	37	32	6	491	330
Iron and steel	10	82	175	41	45	9	12	12	62	31	—	7	304	182
Textiles	10	23	38	6	35	23	99	—	11	149	—	7	193	208
Retail	68	146	68	51	194	162	42	58	190	179	16	20	578	616
Coal	2	30	54	4	10	9	—	12	78	—	—	—	144	55
Ind. raw material	33	55	139	65	111	50	13	30	84	94	8	26	388	320
Commodities misc.	22	160	121	125	157	106	117	36	125	242	16	21	558	687
Total	**694**	**692**	**1001**	**571**	**902**	**660**	**403**	**227**	**763**	**992**	**292**	**135**	**4055**	**3277**

urce: Survey conducted by Perspective Planning Wing, Delhi Development Authority.

v. of the total annual gross freight to and from Delhi, nearly 80% is handled by road transport.
vi. About 14,500 trucks enter and leave Delhi daily. Of the nearly 50% is handled by NH 2 and NH 24.
vii. Of the 14,279 trucks movement to and from Delhi on all regional roads, 4572 are empty.
viii. Of the total truck traffic moving into Delhi, 25% is bye-passable.

iv. By Rail

a. **Passengers:** Studies (by Perspective Planning Wing of Delhi Development Authority) incidate that three rail terminals of Delhi cater to about 78,000 passengers daily going into and out of Delhi by rail as given below:

Delhi Main railway station.	: 50,000
New Delhi railway station	: 25,000
Nizamuddin railway station	: 3,000

Total incoming and outgoing passengers handled at all 33 stations of Delhi suburbs including commuters are about 3,62,000 (1,92,000 commuters and 1,70,000 long and short distance passengers) through 261 trains (137 long distance and 124 short distance within the National Capital Region). The inter-city passenger movement in Delhi has been growing at 4% per annum and as such the projections for 2001 are as below:

Daily total passengers	: 6,72,000
Commuters	: 3,54,000
Long and short distance passengers	: 3,18,000
Total trains	: 4,000

As stated earlier, out of these 6,72,000 passengers, a large number do not have any business in Delhi but have to pass through Delhi due to existing pattern of regional railway movement.

b. **Freight:** On an average, about 1000 loaded wagons enter Delhi. The total freight handled by the rail in the Region is estimated to be 25,000 tons per day. Of the total gross annual freight to and from Delhi, only about 20% is handled by railways and the rest by roads.

iv. By Air

a. **Passengers:** The International Airport Authority of India (IAAI) have projected the international air passengers and domestic air passengers at the following rates as recommended by the Committee on Air Transport Policy, Ministry of Tourism and Civil Aviation.

	Annual growth rate	No. of passengers in 2001
International passengers	12.0%	163 lakhs
Domestic passengers	12.0%	191 lakhs

b. **Cargo traffic:** The cargo movement projected by IAAI for 2001 is as below:

	Rate of increase	Volume in 2001
International cargo	15%	6.4 tonnes
Domestic cargo	12.5%	7.9 tonnes

6.4 Strategy for Development

The regional transport strategy for the National Capital Region should promote and support the economic development of the Region and relieve the capital of traffic congestion. As such it requires:

i. to inter-connect among each other the regional urban centres lying in the outer areas of the National Capital Region.
ii. to connect them with the Capital by fast mode of transport which would require better road and rail connections.
iii. to integrate road and rail services in the intra-urban area of Delhi and also in DMA.
iv. to develop new loading and unloading facilities outside Delhi Union Territory for goods coming from outside the Region for distribution in Uttar Pradesh and Haryana so as to avoid unwanted load of good traffic on the roads of Delhi urban area.

6.5 Proposals for the Road Network (Fig 25)

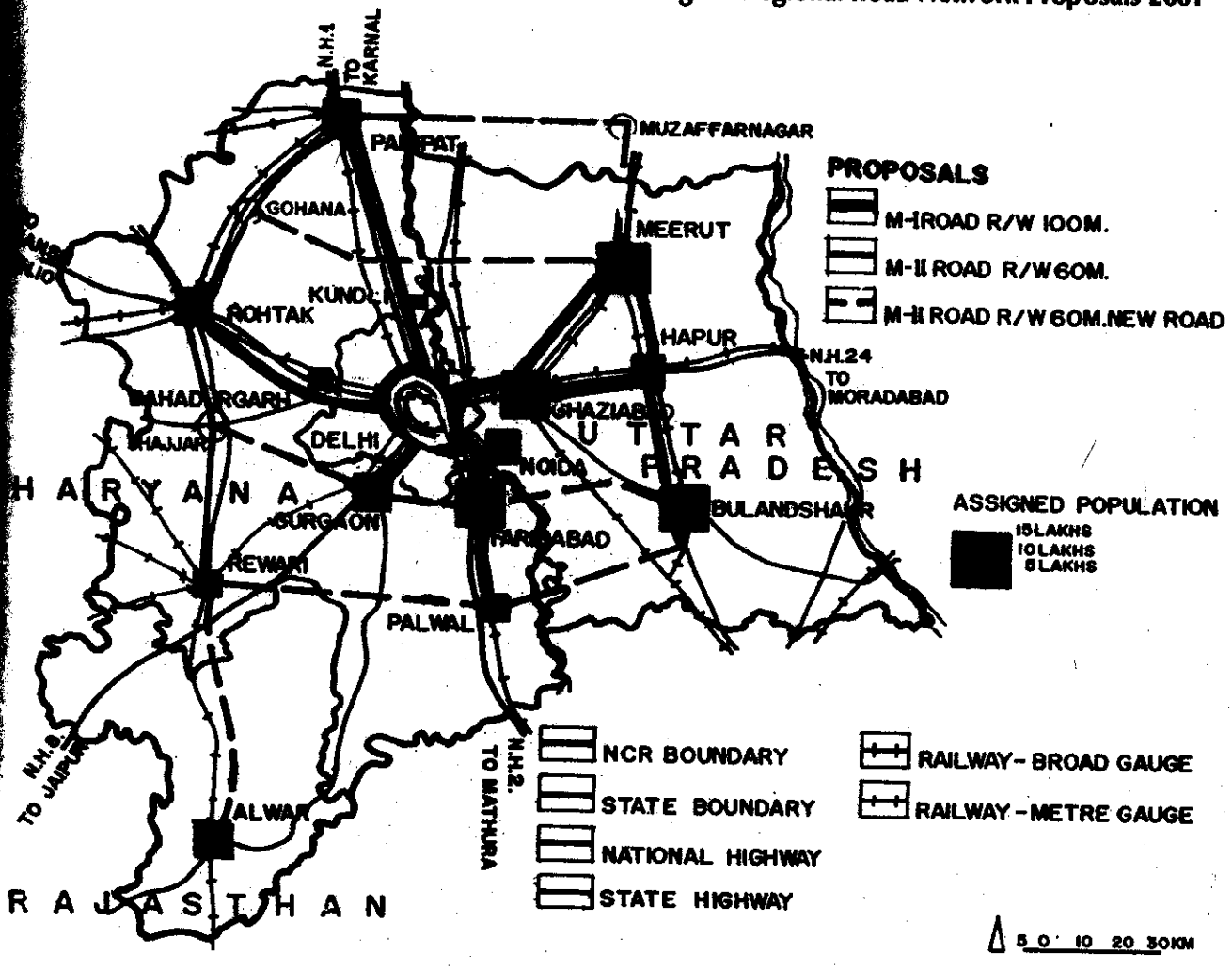
Development of the stretches of NH-1 (Delhi-Panipat), NH-2 (Delhi-Palwal), NH 10 (Delhi-Rohtak), NH-8 (Delhi-Gurgaon) NH 24 (Delhi-Hapur) and existing State Highway between Ghaziabad-Meerut to four lane divided carriage was to be known as M-1* motorway with acquisition of right of way of 100

*The M-1 motorway is to be of dual carriage-way with six lanes of sufficient lane width, all intersections grade separated and at intervals 3 to 5 km (2 to 3 miles) apart. Access controlled with no frontage access, with full restrictions on standing vehicles and designed for a speed of 100 km per hour. The bridges should be designed for the prescribed in highest IRC loading.

etres within the National Capital Region including velopment of service roads in the built up area. engthening of the above National Highways and evation of the State Highway to M-I standard ould cost approximately Rs 140 crores.

Development of an inner and outer grid system of ads of the order of M-II** motorways with certain common streches which would be of two lane carriage way initially with acquisition of full right of way of 60 metres and to four lane carriage way finally by 2001 AD. The inner grid is to follow the alignment of Sonepat–Baghpat–Meerut–Hapur–Bulandshahr–Sikandrabad–Faridabad–Gurgaon–Jhajjar–Rohtak–Gohana–Sonepat. The outer grid would connect

Fig-25. Regional Road Network Proposals-2001



** The inner and outer grid roads of M-II motorway category would be of two lane carriage way initially with acquisition of full right of way of 60 metres and a four lane carriage way finally (by 2001 AD).

Panipat–Muzaffarnagar–Meerut–Hapur–Bulandshahr–Khurja–Palwal–Rewari–Jhajjar–Rohtak–Gohana–Panipat.

a. The inner grid has been envisaged mainly to interconnect all the inner-ring towns in the Region. It would also serve to bypass the inter-regional movement of goods in the Delhi Urban Area. This would require on:

Uttar Pradesh Side:

i. Strengthening from Yamune Bridge to Baghpat and to Meerut.

ii. Widening and strengthening between Sikandrabad and Dankaur (the stretch between Bulandshahr-Meerut is covered in the outer grid).
iii. Construction of a bridge and missing links in the stretch of Dankaur-Yamuna Bridge-Sikandrabad-Faridabad.

Haryana Side:

i. Strengthening complete (20 km) and widening part (12 km) of the road from UP border to Sonepat.
ii. Strengthening and widening of the complete stretch (35 km) between Sonepat-Gohana.
iii. Strengthening complete (45 km) and widening part of (38 km) the Jhajjar-Gurgaon stretch.
iv. Strengthening complete (38 km) and widening part of (31 km) the Gurgaon-Faridabad stretch.
v. Strengthening and widening of the complete stretch (18 km) between Faridabad to UP border (upto Yamuna river).

Development of inner grid would involve approximately Rs 6862 lakhs.

	Stretch	Length (km)	Cost (Rs. in lakhs) including widening strengthening, bridges and by-passes wherever required
i	Yamuna Bridge-Baghpat-Meerut	53	611.71
ii	Bulandshahr-Sikandrabad	13	117.00
iii	Sikandrabad-Dankaur	17	216.31
iv	Dankaur-Yamuna Bridge-Faridabad	—	1360.00
v	Faridabad-Yamuna river	18	704.45
vi	Faridabad-Gurgaon	38	954.00
vii	Gurgaon-Jhajjar	45	667.00
viii	Jhajjar-Sonepat	35	515.00
ix	Sonepat-UP border	20	1715.95
	Total cost of inner grid		**6861.42**

b. The outer grid has been envisaged to interconnect the important towns lying in the outer areas of NCR and to open-up the vast undeveloped areas for development. Development of this grid would require from UP side:

i. Widening and strengthening of the stretch between Yamuna bridge-Muzzaffar nagar (54 km) and strengthening of the stretch between Muzaffarnagar and Meerut (53 km).
ii. Widening of the stretch between Meerut-Hapur.
iii. Widening and strengthening of Hapur-Bulandshahr stretch.
iv. Widening and strengthening of the stretch between Khurja and Yamuna bridge (Bulandshahr-Khurja and Yamuna bridge Bulandshahr-Khurja.

and on Haryana Side it would require:

i. Widening and strengthening of the stretch from Yamuna bridge-Panipat, Panipat-Gohaha, Gohana-Rohtak, Rohtak-Jhajjar, Jhajjar-Rewari, Rewari-Sohna, Sohna-Palwal and Palwal-Yamuna Nagar (a total of 270 km).
ii. Construction of new bridges and widening of some existing bridges.

	Stretch	Length (in km)	Cost (Rs. in lakhs) including widening strengthening, bridges and by-passes wherever required
i	Yamuna Nagar-Muzaffarnagar-Meerut*	107	1045.16*
ii	Meerut-Hapur-Bulandhshahr	69	715.74
iii	Bulandshahr-Khurja	19	171.00
iv	Khurja-Yamuna Bridge	45	540.79
v	Yamuna bridge-Palwal	15	754.85
vi	Palwal-Sohna-Rewari	76	1695.50
vii	Rewari-Jhajjar Rohtak	86	2198.40
viii	Rohtak-Gohana-Panipat-Sonauli	93	1925.00
	Total cost for outer grid (excluding item i)		**8001.28**

*to be financed by the concerned State Government.

Alwar has greater growth potential with its tourist importance and flourishing commercial activities. Further, to take out developmental activities far away from Delhi, it is necessary to develop a motorway of M-II standard between Rewari and Alwar.

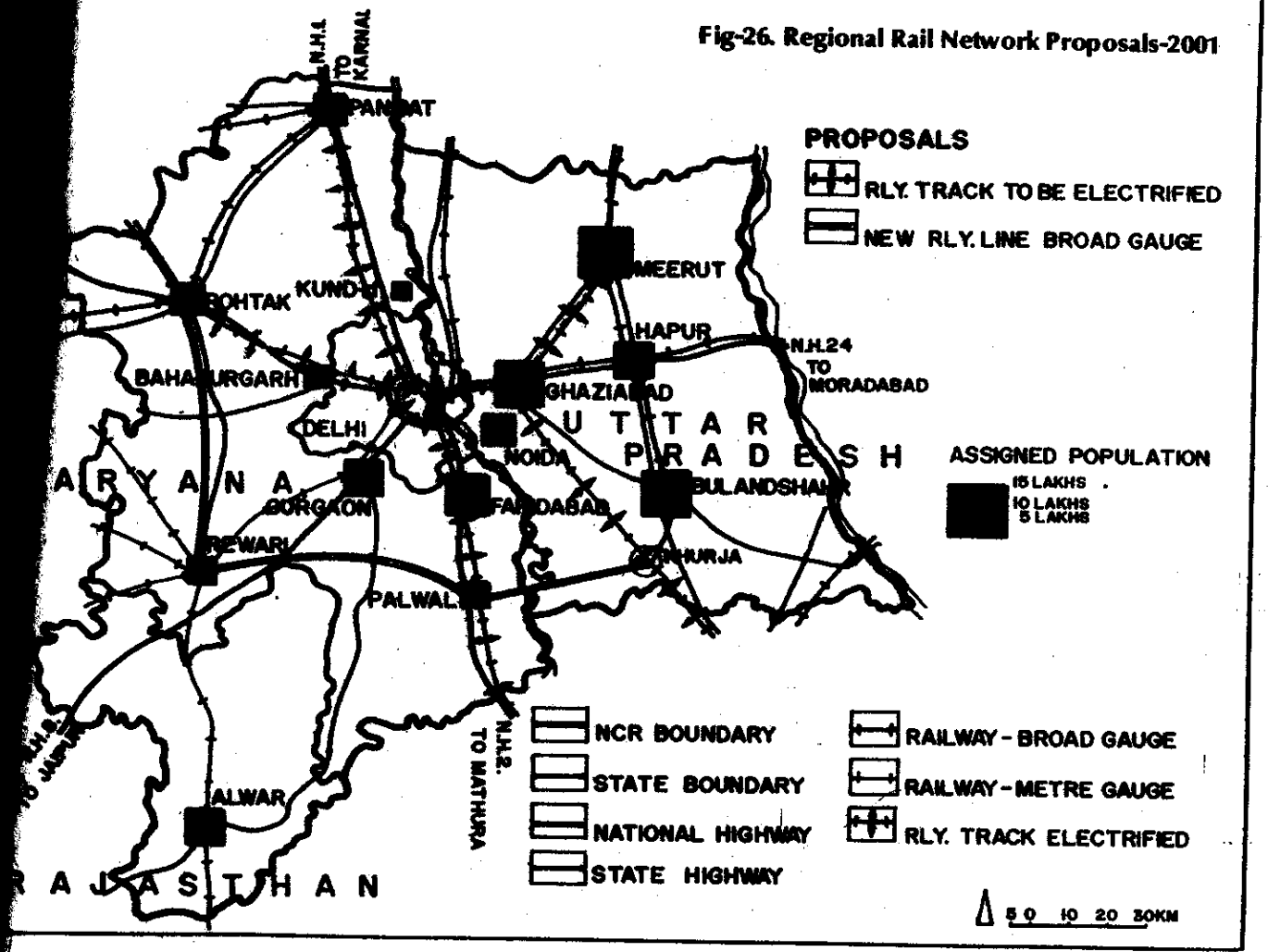
uld be of two lane carriage way initially with lon of full right of way of 60 metres for an four lane carriage way when traffic require- stify. Such a line would open up vast areas of and Rajasthan for development. Develop- this 70 km stretch would cost approximately lakhs (at Rs. 5 lakhs per km).

ler towns of the National Capital Region have agnating mainly because of their location in dow of bigger urban centres. However, their ny could be revitalised by providing suitable ucture facilities so that they act as link bet- he rural areas and the bigger urban centres acting as service centres for the rural popula- ansport sector would be able to provide the nomentum for their regeneration. In conson- lth the policy of developing a four tier system lements, road structure in the Region would olved accordingly. Efforts would be to inter- connect the same order centres directly and the lower order centres of their nearest higher order centres. A system of feeder roads of higher standard would be evolved to connect the work centres/ industrial estates with the nearest regional or sub-regional settlements.

6.6 Proposals for development of railway (Fig 26)

As discussed earlier, there is a huge bypassable traffic that enters Delhi unnecessarily. It is proposed to develop a regional rail bypass. This is expected to drain and diverge out bypassable traffic that otherwise would move through Delhi. This line would pass through Meerut-Hapur-Bulandshahr-Khurja-Palwal-Sohna-Rewari-Jhajjar-Rohtak-Panipat. With lines already existing between several stretches, new lines would have to be developed between Khurja-Palwal-Sohna-Rewari-Jhajjar-Rohtak. This 205 km would cost approximatly Rs. 13,600 lakhs.

Fig-26. Regional Rail Network Proposals-2001



With the idnetification of Rewari Complex and Alwar as priority centres with envisaged population and activities, it is proposed that efforts should be taken for conversion of the existing low capacity metre gauge railway system into high capacity system between Delhi-Alwar.

There is an urgent need to identify and decide on a location for another rail terminal to decongest and solve problems faced by the existing terminal in Delhi.

To facilitate easy commuting from distant places and priority towns, it is necessary to take up electrification of selected corridors. They are Delhi-Panipat, Delhi-Meerut beyond Ghaziabad, and Delhi-Rohtak beyond Shakur-basti. This would cost a total amount of Rs 4700 lakhs.

	Stretch	Details of work	Cost (Rs in lakhs)
A.	Delhi-Panipat (88 km)	i. Electrification and raising of platforms, FOB, etc.	1200
		ii. Automatic colour lighting, signalling at Subzi Mandi, Sonepat, Panipat.	300
		iii. Terminal facilities at Panipat including information system etc.	200
		iv. Staff quarters	300
B.	Delhi-Meerut beyond Ghaziabad	Doubling from Muradnagar to Meerut and electrification and raising of platforms, FOBs, and signalling, installation, etc.	1500
C.	Delhi-Rohtak beyond Shakurbasti	Electrification, raising of platforms, FOBs, including signalling installation.	1200
	Total Cost		**4700**

Subsequent to electrification of the above corridors, operation of EMU services on these corridors on the desired frequency would be needed. This would cost Rs 2200 lakhs. The stretches and requirements are:

	Stretch	Requirements*	Cost (Rs in lakhs)
i.	Delhi-Panipat	5 Rakes-15 MC – 30 TC	800
ii.	Ghaziabad-Meerut	4 Rakes-12 MC – 24 TC	600
iii.	Shakurbasti-Rohtak	5 Rakes-15 MC – 30 TC	800
	Total cost		**2200**

* Requirements as in 1983. Refined assessment would be made after detailed studies.

Operation of Electrical Multiple Units (EMU) Services on the ring with required frequency, initially with a lead time of 25 minutes in peak period/direction alongwith extension of EMU services on three selected corridors (radially) viz i. Delhi-Ghaziabad, ii. New Delhi–Palwal, iii. Delhi-Shakurbasti which are already electrified, replacing all the shuttle services to Shakurbasti, Ghaziabad and Palwal. This would require an amount of Rs 1300 lakhs (excluding ring railway requirements in Delhi Urban Area).

	Stretch	Requirements*	Cost (Rs in lakhs)
i.	Ring railway in Delhi Urban Area**	Rolling stock of of 24 coaches ie, 8 MC, 16 TC	500
ii.	Delhi-Ghaziabad	27 coahces-9 MC, 18 TC	500
iii.	New Delhi-Palwal	5 Rakes – 15 MC, 30 TC	800
	Total cost		**1300**

* Requirements as in 1983. Refined assessment would be made after detailed studies.

** Finance to be managed by Delhi Administration/Delhi Development Authority.

For the operation of EMU services and to have such services on the desired frequency, development of certain additional infrastructural inputs in selected corridors is required. This would involve some additional stations to be opened and certain other inputs besides raising of platforms to suit EMU coach operation. This would incur a total cost of Rs 2445 lakhs. The corridors and actions needed in respective corridors are:

Corridor	Stations to be opened	Input required	Cost (Rs in lakhs)
A) Delhi-Shahdara-Ghaziabad	Gandhi-Nagar Shyamlal	Creation of new halt station and removal of the infringments to suit EMU	50
i. Stations inside Delhi UT, ii. Stations outside Dehli UT	Giani border Mohan Nagar		
B) New-Delhi	Shakarpur BEL	Creation of crossing and halt stations	60
New Delhi-Palwal	Junction Cabin	Creation of halt station	12
New Delhi-Shakur-basti	Rampura Cabin	Creation of halt station	12
Accessibility facilities at Eight Stations (Finance to be arranged by DDA/ Delhi Administration partly)			20
Lengthening of platforms for 25 bogies at Delhi and New Delhi stations*			500
Provision of independent double line between Delhi-New Delhi-Kishanganj-Delhi and Subzi Mandi*			
Doubling and electrification of Dayabasti-Azadpur Section*			600
a) Two more lines between Ghaziabad and Maripet car shed			
b) An additional line (4th line) between Shahibabad and Ghaziabad			800
Extension of 4th line from junction cabin to Palwal			1000
A) Automatic signalling between Tughalakabad and Palwal			300
B) Staff quarters and office building			300
Total cost (excluding programme to be financed by DDA/Delhi Administration			**2445**

Financing to be arranged by DDA/Delhi Administration

The ring railway which has been conceived to lve the traffic problems of Delhi runs under-uti-ed and as such actions are required to enable it to ovide a meaningful role in the transportation of ra-city passengers and inter-city commuters. This quires evaluation of introduction of new rapid gh capaicty mass transport system such as Light il Transit (LRT) etc, and, to reorganise Delhi Tran-ort Corporation's fleet services to provide feeder rvice to EMU service as well as other high capacity ass transport system conceived for smooth intra-rban travel and improve the efficiency of ring and dial service.

With the identification of Khurja and Hapur as riority towns and subsequent envisaging of activi-es and population on a greater scale, it is obvious hat interaction between Delhi and these centres ould increase and intensify and as such projection f traffic volume is necessary in advance. Feasibility, valuation/technoeconomic studies for the deve-opment of existing/new corridors and extension of xisting corridors in the lines i. Ghaziabad-Khurja for MU services, ii. Ghaziabad-Hapur for electrification nd EMU services, and iii. Dayabasti-Azadpur for new electrified line and EMU services should be undertaken.

To enable the ring railway to play a meaningful role in serving inter-city and intra-urban commuters, it is necessary to increase the frequency in the ring in stages to reach the ultimate desired frequency level for the envisaged population and to extend the same to Ghaziabad on the east, Palwal to the south, Indira Gandhi Airport and Rohtak on the south-west and west and towards Panipat in the north.

To cater to the needs of the outer areas of Delhi and Delhi Metropolitan Area and further to encourage in the outskirts of the city, such activities which would help interaction between outer towns and Delhi Metropolitan Area there is need to edevelop new integrated metropolitan terminals in the areas of (a) Trans-Yamuna, (b) Okhla, (c) Bharthal and (d) in north India. Locational and other techno-economic studies for these terminals may be taken up immediately.

6.7 Proposal for Airways

With identification of priority towns with

enhanced population which is primarily aimed to be gained through developmental activities and industries, it is necessary to probe into the possibilities of extending air services to these towns through short distance carriers.

6.8 Financing Strategy

It should be ensured that investments directly involve in achieving the objectives envisaged for National Capital Region development, With this aim, while financing any development, the following main criteria would be taken into consideration besides the cost component: i. The needs of priority areas and new development and extension areas, ii. the extent to which such proposals would aid the objective of decongesting Delhi and would help in taking away to or generating activities in the outer areas of the Region and iii. benefits such proposals would accrue to the existing industries and commerce for their expansion and employment generation.

In selecting locations for new loading and unloading facility centres, priority and preference would be for locations that have greater potential/capacity to drain and diverge out maximum traffic.

It is suggested that a single unified Metropolitan Transport Authority may be constituted to look into the inter-relation and interaction of various modes. Such an Authority specially in NCR may help in rationalising the inter-city and intra-city fare structures between railway, EMU and the road transport and also may help in facilitating the inter-change from rail to road and road to rail as well as from regional trains to intra urban railway in Delhi.

6.9 Telecommunication Facilities

The foremost need of the Region is an adequate and effective telecommunication network which would provide impetus to the dispersal and development of economic activities away from Delhi to outlying areas. The National Capital Region Plan advocates a three tier system for the development of economic activities in the Region as a broad policy and has also recommended development of eight towns and complexes in the Region on priority basis. Provision of reliable and adequate telecommunication facilities in the Delhi Metropolitan Area and in the selected towns as input has been considered necessary for preparing a realistic plan.

The following objectives are considered desirable for provision of telecommunication facilities in the selected towns and the towns falling in Delhi Metropolitan Area:

- Full automatisation of telephone services.
- Replacement of all life expired exchanges and other equipments.
- Provision of telephone and telex connection practically on demand.
- Provision of subscribers dialling facilities between Delhi and the priority towns and DMA towns.
- Connection of priority towns and DMA towns with Delhi by reliable cable and radio media.
- Provision of reliable trunk services either by direct dialling facilities or through demand service among the priority towns and DMA towns.
- Provision of telegraph offices as justified.

An integrated telecommunication system adopted on the above lines in a way, is also likely to supplement the transportation network in the Region thereby reducing the pressure on the transportation arteries proposed in the Plan.

Interim Plan envisages provision of required telecommunication facilities at the first instance, in the selected priority towns and towns of DMA. Details of facilities and cost involved are as follows:

Facilities/Inputs	Quantity (in No.)	Cost (Rs. in lakhs)
Local Switching		
i) Replacement	21,150 × 5890	1245.74
ii) Net Expansion	1,08,550 × 12962	14070.25
		15315.99
Telex		
i) Capacity	540 × 17235	93.07
ii) Teleprinters	540 × 26500	143.10
		236.17
Trunk Exchanges		
i) Trunk Centres at Faridabad & Ghaziabad with 40 Boards	2 × 27.5 lakhs	55.00
ii) Trunk Boards	3 × 00.18 lakh	0.54
		55.54
Transmission		
i) Open Wire Systems		
a) 3 chl.	24 × 1.2 lakhs	28.8
b) 8 chl.	12 × 2 lakhs	24.00
		52.8
ii) VFT		
a) 12 chl.	7 × 1.8	12.6
b) S + 4D	18 × 1.2	21.6
		34.2
iii) Coaxial	9 schemes	1720.18
iv) Optical fibre	3 schemes	517.06
v) UHF	7 × 84.3	590.10
vi) Microwave	8 schemes	936.26
vii) PCM	5 schemes	175.00
Telegraphs		127.27
Land & Buildings		1000.00
TOTAL		**20761***

Some of the listed programme costing about Rs. 70 crores have already been included in the Department of Telecommunications, Ministry of Telecommunications in Seventh Plan Budget.

POWER DEVELOPMENT

7

Electricity, one of the most important forms of energy, is the life-blood of modern society. It is indispensable for the development of industry and agriculture and for improving the living standards of the people.

7.1 Generation

The Region falls within the Northern Power Zone. The power requirement of Delhi is met mainly by the Rajghat and Indraprastha Estate Power Stations owned by the Delhi Electricity Supply Undertaking and the Badarpur Thermal Station owned by the National Thermal Power Corporation. All these stations are located within Delhi. In addition, Delhi receives assistance from the Baira Siul Hydro Electric Power Station, the Singrauli Thermal Power Station and from the Northern Region grid including the Bhakra Beas Management Board system to meet its demand for power.

The Uttar Pradesh Sub-region receives power from the integrated grid of the Uttar pradesh Power System and the Northern region grid. It may be noted that all the hydel and thermal power systems run as an integrated grid. Further, the Uttar Pradesh Power System is being operated in synchronisation with Northern region grid comprising Jammu and Kashmir, Punjab, Himachal Pradesh, Haryana, Delhi, Rajasthan and part of Madhya Pradesh.

Haryana, in addition to receiving power from its own generating stations, receives power from Bhakra-Beas Management Board (BBMB); Pong, Dehar and Baira-Siul Hydel Stations and Indraprastha station to meet its demand. The Haryana Sub-region thus receives power from various sources.

Rajasthan's power demand is met by the generating stations owned by the Rajasthan Electricity Board and power made available from the BBMB system, Singrauli Super Thermal System and power imported from the neighbouring States. The Rajasthan Sub-region, which forms part of the State, has, therefore, to depend on many sources to meet its power demand.

The Region does not have any power resources. There are five thermal power-generating schemes within the Region with a total installed capacity of 1431.5 MW (Table 7.1)

Five more power plants with a total installed capacity of 1215.3 MW are under construction in the Region. Among these, one is atomic, two are thermal, one is hydel and one is gas-based. All the plants are expected to be completed by the end of 1988. Thus by the end of the Seventh Plan, the total installed capacity, would increase to 2646.8 MW. Among the schemes that are under construction, Kokroi is the only hydel scheme with an installed capacity of only 0.3 MW. The Narora Atomic Project is the biggest among the projects under construction.

Among the Seventh Plan proposals relating to power generation schemes, only one namely, the Muradnagar Thermal Scheme falls in the Region. This scheme falls in the Central sector and would be executed by the National Thermal Power Corporation. According to the Central Electricity Authority, the Muradnagar scheme would have four units of 210 MW each. Thus, the total installed capacity of the scheme would be 840 MW. The first and the second units are expected to be commissioned by the end of 1994 and the remaining units by the end of 1995. Thus, all the units are proposed to be commissioned by the end of the Eighth Plan. The Muradnagar scheme is expected to meet the growing demand for power of Delhi. However, if any surplus is left after meeting the demand of Delhi, it would be fed into the northern grid.

Assuming that the Muradnagar scheme would materialise and would be completed by the end of the Eighth Plan, the total installed capacity (including the existing and under construction) in the Region would increase to about 3500 MW.

ble 7.1 **Power Generation in the National Capital Region (as on 31.3.1985)**

me of heme	Location (Tehsil)	Type	Units x Rated capacity (MW)	Total Installed capacity (MW)	Probable date of commissioning, if not already commissioned
Existing					
Rajghat	Delhi	Thermal	1 × 14	14.0	
I.P. Estate	Delhi	Thermal	1 × 35 + 3 × 62.5 + 1 × 60	282.5 *	
Badarpur	Delhi	Thermal	3 × 100 + 2 × 210	720.0	
Panipat-Stage-1	Panipat	Thermal	2 × 110	220.0	
Faridabad	Ballabhagarh	Thermal	1 × 15 + 3 × 60	195.0	
				1431.5	
Under Construction					
Rajghat	Delhi	Thermal	2 × 67.5	135.0	Unit 1 – May 88 Unit II – Sep. 88
Gas Turbine Scheme near I.P. Station (I.P. Estate)	Delhi	Gas	6 × 30	180.0	1st Unit to be commissioned in April 86 and one unit per month thereafter
Panipat Units 3,4,5 (Stages II & III)	Panipat	Thermal	2 × 110 + 1 × 210	430.0	Unit 3 – Oct. 85 Unit 4 – Aug. 85 Unit 5 – Dec. 87
Kokroi	Sonepat	Hydel	3 × 0.1	0.3	1986-87
Narora	Anupshahr	Atomic	2 × 235	470.0	Unit I – Dec. 87
				1215.3	Unit II – Dec. 88
Proposed in the Seventh Plan					
Muradnagar	Ghaziabad	Thermal	4 × 210	840.0	Unit I – 1992-93 Unit II – 1993-94 Units III & IV – 1994-95
				840.0	
	Grand Total:		3486.8		

ncludes share of Haryana of 62.5 MW. Sources: 1. Data obtained from the State/UT Governments. 2. Central Electricity Authority.

2 Transmission and Distribution

The Region has a network of 400 KV, 220 KV, 32 KV, 66 KV, 33 KV, 11 KV and low tension lines or carrying power to load centres from the generating stations.

3 Rural Electrification

Electrification of villages is indispensable for improving the living standards of rural people. Energisation of pumpsets goes a long way in increasing agricultural production. In the Region as a whole, about 94% of the villages are electrified (Table 7.2). All the villages in the Union Territory of Delhi and in the Haryana Sub-region are electrified. The position of rural electrification is quite unsatisfactory in the Rajasthan Sub-region. In the Rajasthan Sub-region, only about 80.5% of the villages had been provided with electricity till the end of March 1985. As far as the Uttar Pradesh Sub-region is concerned, all the villages in Meerut district are electrified. 10% of the villages in Ghaziabad district and 7% in Bulandshahr district are yet to be electrified. The overall percen-

tage of rural electrification for the Uttar Pradesh Sub-region works out to about 94%.

During the Seventh Plan period, all the un-electrified villages in Bulandshahr district are expected to be electrified. In Ghaziabad district, all unelectrified villages except two, are proposed to be electrified during the Seventh Plan period. As far as the Rajasthan Sub-region is concerned, the information relating to number of villages proposed to be electrified during the Seventh Plan period is not available.

About 1.6 lakh pumpsets have been energised in the Region till the 31st March 1985. The figure is expected to reach 1.8 lakhs by the end of the Seventh Plan. It may, however, be noted that Panipat, Rewari, Bawal tehsils of the Haryana Sub-region and the whole of the Rajasthan Sub-region have not been taken into account as figures pertaining to these areas are not available (Table 7.2).

Table 7.2 Rural Electrification and Energisation of Pumpsets as on 31st March 1985

S. No.	Area	Total No. of inhabited villages	Villages electrified as on 31.3.1985	Villages proposed to be electrified during VII Plan	Villages to be electrified by the end of VII Plan	Pumpsets energised as on 31.3.1985	Pumpsets proposed to be energised during VII Plan	Pumpsets to be energised by the end of VII Plan
1.	**Delhi U.T.**	214	214 (100.0)	Nil	214 (100.0)	15732	2500	18232
2.	**U.P Sub-region**							
	1. Meerut Distt.	1045*	1045	Nil	1045	37715	4882	42597
	2. Ghaziabad Distt.	791*	711	78	789	7109	3388	10497
	3. Bulandshahr Distt.	1467*	1364	103	1467	36298	7195	43493
Sub-total (II)		3303	3120 (94.4)	181	3301 (99.9)	81122	15465	96587
3.	**Haryana Sub-region**							
	1. Sonepat Distt.	331	331	Nil	331	11584	2000	13584
	2. Gurgaon Distt.	673	673	Nil	673	25185	2000	27185
	3. Faridabad Distt.	425	425	Nil	425	15510	1000	16510
	4. Rohtak Distt.	438	438	Nil	438	11054	3000	14054
	5. Panipat Distt.	167	167	Nil	167	N.A.	N.A.	N.A.
	6. Rewari & Bawal Tehsils	352	352	Nil	352	N.A.	N.A.	N.A.
Sub-Total (III)		2386	2386 (100.0)	Nil	2386 (100.0)	63333	8000	71333
4.	**Rajasthan Sub-region**							
	Alwar, Behror, Mandawar, Tijara, Kishangarh and Ramgarh Tehsils	1063	856 (80.5)	N.A.	856	N.A.	N.A.	N.A.
Grand Total		6966	6576 (94.4)	181	6757 (96.9)	160187	25965	186152

* Includes uninhabited villages.

Note: Figures in brackets indicate percentages to the total number of villages in the respective sub-region/region.

Energy Consumption (Aggregate)

uring 1984-85, the total energy consumption in egion was about 5045 million units. A look at ttern of energy consumption (Table 7.3) shows e industrial sector accounted for the highest rtion (about 33%) and followed by the stic sector (about 25%).

alysing the position of individual sub-regions, it n that in the Rajasthan Sub-region, the propor- f industrial consumption is very high (79%). In aryana Sub-region, industrial sector ranks first s of energy consumption, but the proportion very high. Agriculture sector occupies first in the Uttar Pradesh Sub-region. In the case of n Territory of Delhi, domestic sector accounts e highest proportion of energy consumption. commercial activities dominate as much as trial activities in Delhi's economy, the propor- of energy consumption in the commercial sec- much higher in Delhi than in other Sub-regions. ne of the Sub-regions of Uttar Pradesh, Haryana Rajasthan, the proportion of energy consump- n the commercial sector exceeds 5%, whereas lhi, the proportion is about 21% (Figure 27). e pattern of consumption clearly indicates high centration of industries in the Union Territory of i, Faridabad district and Rajasthan Sub-region ar district).

Per Capita Energy Consumption

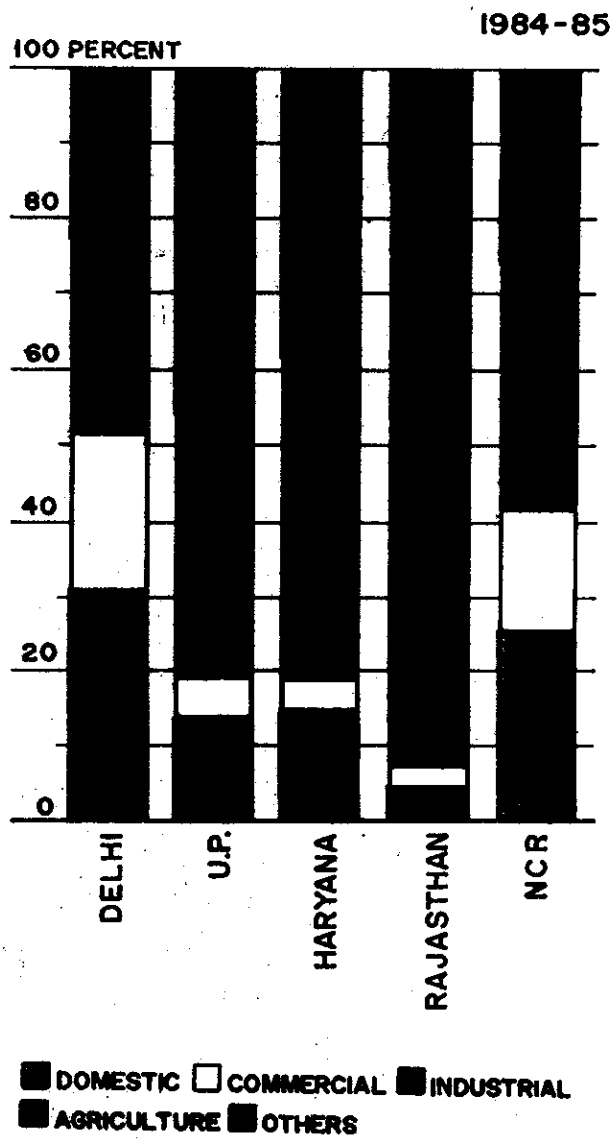
r capita energy consumption is a good indica- f economic development. In the Region as a le, the per capita energy (aggregate) consump- was 263 units in 1984-85. The per capita indus- consumption was only 87 units (Table 7.4).

le 7.4 Per Capita Consumption of Electricity in the NCR 1984-85 (Unit: Kwh)

o.	Sub-region	Per capita consumption (Total	Per capita consumption (Industrial)
	Delhi	571	151
	Haryana	213	91
	Rajasthan	271	214
	Uttar Pradesh	22	8
	Total	263	87

te: Per capita has been worked out on the basis of 81 census population.

Fig-27. Pattern of Energy Consumption



A look at Table 7.4 shows that per capita aggregate consumption is alarmingly low (only 22 units) in the Uttar Pradesh Sub-region, which indicates that this Sub-region is highly backward in the Region. The position of the Haryana and Rajasthan Sub-regions is, however, better than that of the Uttar Pradesh Sub-region. However, these Sub-regions are also much behind Delhi. In case of Delhi, the high per capita energy consumption can be attributed to two reasons: first, it has a satisfactory power supply position, and secondly, it is economically more developed than other areas of the Region.

Table 7.3 Energy Consumption in the NCR 1984-85 (Figures in million units)

S.No.	Area	Domestic	Commercial	Industrial	Agricultural	Others	Total
I.	**Delhi U.T.**	1090.00	752.00	941.00	22.00	745.00	3550.00
	Sub-total(I)	1090.00 (30.7)	752.00 (21.2)	941.00 (26.5)	22.00 (0.6)	745.00 (21.0)	3550.00 (100.00)
II.	**U.P. Sub-region**						
	1. Meerut Distt.	11.23	3.75	12.35	25.77	0.86	53.96
	2. Ghaziabad Distt.	7.95	2.95	38.99	14.84	1.39	66.12
	3. Bulandshahr Distt.	2.97	0.23	4.66	27.44	0.16	35.46
	Sub-total (II)	22.15 (14.2)	6.93 (4.4)	56.00 (36.0)	68.05 (43.8)	2.41 (1.6)	155.54 (100.0
III.	**Haryana Sub-region**						
	1. Sonepat Distt.	21.19	3.55	72.54	39.68	1.40	138.36
	2. Gurgaon Distt.	19.34	4.76	41.83	47.71	4.85	118.49
	3. Faridabad Distt.	46.82	12.88	245.34	54.83	8.69	368.56
	4. Rohtak Distt.	38.90	9.36	57.90	51.71	3.81	161.68
	5. Panipat Tehsil	26.09	6.19	25.94	158.04	2.30	218.56
	6. Rewari and Bawal tehsils	8.49	1.87	8.25	22.28	3.57	44.46
	Sub-total(III)	160.83 (15.3)	38.61 (3.7)	451.80 (43.0)	374.25 (35.6)	24.62 (2.4)	1050.11 (100.0
IV.	**Rajasthan Sub-region**						
	1. Alwar, Behror, Mandawar, Tijara, Kishangarh and Ramgarh tehsils	12.43	6.78	227.79	22.85	18.71	288.56
	Sub-total(IV)	12.43 (4.3)	6.78 (2.3)	227.79 (79.0)	22.85 (7.9)	18.71 (6.5)	288.56 (100.0
	Grand Total (I+II+III+IV)	1285.41 (25.5)	804.32 (15.9)	1676.59 (33.2)	487.15 (9.7)	790.74 (15.7)	5044.21 (100.0

* In case of Rajasthan Sub-region, since tehsilwise figures were not available, consumption has been estimated from the district figures. It has been assumed that in case of agriculture, the Sub-region's consumption is about 60% of the district's consumption. In case of others, it has been taken as 90%. This is because, percentage of rural population of the Sub-region is about 60% of the district's rural population and the Sub-region's urban population constitutes about 90% of the urban population of the district.

Note: Figures in brackets indicate percentages to the respective total.

Looking at the per capita industrial consumption, it is observed that the Rajasthan Sub-region ranks first followed by Delhi. As far as the Uttar Pradesh Sub-region is concerned, it not only occupies the last position, but its per capita energy consumption is also very low being only 8 units. In case of Haryana also, the per capita is much lower than that of Delhi. This is perhaps because of inadequacy of power supply in Haryana.

7.6 Power Supply Position.

Delhi is definitely better placed as far as pow supply is concerned. This has been one of the factc that attracted entrepreneurs to set up business Delhi. As far as the other Sub-regions are concerne the power supply position is highly unsatisfactory Haryana followed by Uttar Pradesh. This is evide from Table 7.5 which gives power supply position

ous States/UT, parts of whose areas fall in the ion.

le 7.5 Power Supply Position during April 1985–March 1986

(Figures in million units)

e /UT	Require-ment	Availa-bility	Shortage	
			Absolute	% to demand
ryana	5507	4223	1284	23.3
asthan	7100	6573	527	7.4
ar desh	17633	15477	2156	12.2
lhi	4880	4869	11	0.2

ce: Central Electricity Authority

may be seen from the above figures that the tion of Rajasthan also was not satisfactory.

uring 1984-85, the power supply position in ana, Rajasthan and Uttar Pradesh was worse what it was during the year 1985-86. The energy tage (percentage: monthwise) during 1984-85 be seen in Table 7.6. Haryana experienced an rage daily shortage of about 28% during 1984-85 was followed by Uttar Pradesh which faced an age daily shortage of about 26%. Rajasthan's tion was better, as it faced an average daily shor- of only about 14%. Delhi had practically no tage during 1984-85.

ooking at the monthwise position, it is observed Haryana, Rajasthan and Uttar Pradesh faced tage throughout the year. At no time of the year, shortage was less than 20% in Uttar Pradesh. The tage in Uttar Pradesh ranged from about 22% in tember 1984 to 34% in March 1985. The position laryana is more or less similar to that of Uttar Pra- h. Only in two months ie, June and July 1984, the tage was less than 20% in Haryana. In fact, the tion of Haryana is worse than that of Uttar Pra- h as it faced a shortage of atleast 35% in four nths (December 1984–March 1985) during 1984-

The position of Rajasthan is definitely much better n that of Haryana and Uttar Pradesh. Though asthan faced shortage throughout the year, the tent of shortage has been quite less (less than 10%) ring June to October 1984. Further, the shortage ver reached 30% in any of the months during 84-85. The maximum shortage was about 29% ich was experienced in April 1984.

Delhi faced only a negligible shortage throughout the year. In fact, the shortage was recorded as 'Nil' during December 1984 and March 1985. The overall percentage for the year was also recorded as 'Nil'.

Table 7.6 Percentage of Energy Shortage (Average Daily Shortage) during 1984-85

Month/Year	Haryana	Rajasthan	U.P.	Delhi
April 1984	28.0	29.0	23.0	0.1
May 1984	25.7	17.7	28.0	0.3
June 1984	14.0	6.9	23.1	0.7
July 1984	15.3	2.9	24.0	0.5
August 1984	27.1	6.4	23.9	0.1
September 1984	23.9	1.8	22.3	0.1
October 1984	29.4	6.3	24.1	0.2
November 1984	23.9	14.7	25.7	0.1
December 1984	34.9	21.8	23.2	Nil
January 1985	39.5	19.0	26.6	0.8
February 1985	38.4	22.2	28.5	0.1
March 1985	35.8	13.3	34.0	Nil
1984-85	28.2	14.3	25.8	Nil

Source: Annual Administration Report (1984-85) of Northern Regional Electricity Board.

7.7 Proposals by the Participant State Governments

From the proposals submitted by the State Governments of Haryana, Rajasthan and Uttar Pradesh, it is observed that a total of Rs. 684 crores will be required in the Seventh Plan to improve the quality of power supply in the Region. The Statewise break-up is as follows:-

Rupees in crores

State	Amout required for		Total
	Generation	Transmission and distribution lines and sub-stations.	
Haryana	420.00	85.00	505.00
Rajasthan	—	23.00	23.00
Uttar Pradesh	—	156.00	156.00
Total	420.00	264.00	684.00

Haryana Government has indicated that the present peak demand in the National Capital Region portion of Haryana as 200 MW and this would increase to 650 MW by 1989-90. To meet this demand, an installed capacity of 1000 MW would be needed. It has, therefore, been suggested by Haryana Government that 2 units of 210 MW each should be added at the Panipat Thermal Complex or should be installed at a new site near Gurgaon. The State Government has indicated that this would cost about Rs. 420 crores. As far as the Uttar Pradesh and Rajasthan Sub-regions are concerned, the State Governments have not given any proposal relating to generation schemes.

It may be noted that as far as laying of transmission and distribution lines and construction of sub-stations are concerned, the amount required for the Uttar Pradesh Sub-region is in addition to what would be available from the State's normal plan. As far as the other Sub-regions are concerned, it seems from the proposals submitted by the concerned State Governments that the amount indicated is the total requirement. Broad details of the transmission and distribution lines and sub-stations proposed by the State Governments are as follows:-

I. Haryana

Sl. No.	Item	Amount (Rs. in crores)
1)	220 KV works including sub-stations and lines	30.00
2)	132 KV works including sub-stations and lines	18.00
3)	66 KV works including sub-stations and lines	28.00
4)	33 KV works including sub-stations and lines	9.00
	Sub-total	85.00
II. Uttar Pradesh		
1)	220 KV works	
	i) Sub-stations	116.50
	ii) Lines	3.80
2)	132 KV works	
	i) Sub-Stations	14.25
	ii) Lines	6.85
3)	33 KV works	
	i) Sub-Stations	16.70
	ii) Increasing capacity	3.82
	iii) Lines	7.80
	iv) Miscellaneous	5.26
4)	11 KV works	
	i) Sub-stations	8.02
	ii) Lines	14.09
	iii) L.T. Lines	23.99
5)	Tools and Plants	2.69
6)	Spares	5.00
7)	Communication	1.35
8)	Establishment, cost of building contingency and other charges.	25.90
	Sub-total	156.02

III. Rajasthan

The following works have been proposed. The schemewise cost has not been indicated by the State Government.

1) 132 KV line from Alwar to Shahjahanpur via Khairthal and Mandawar with the following 132 KV sub-stations.

132/33 KV Sub-station at Khairthal.
132/33 KV Sub-station at Mandawar.
132/33 KV Sub-station at Shahjahanpur.

2) 132/33 Sub-station at Malakhera by looping in and looping out 132 KV line from Alwar to Rajgarh.

3) 33 KV line from Shahjahanpur to Mandhan.

4) 33 KV line from Mandawar to Sodawas.

5) 33 KV inter-connections to 33/11 KV Sub-stations-Shahjahanpur, Mandawar, Khairthal and Malakhera.

6) 220 KV line from Alwar to the proposed gas-based thermal power station at Sawai Madhopur (already taken up in central sector) via Dausa and strengthening its links with the northern regional grid 220 KV line from Panipat to Alwar.

ATER SUPPLY, SEWERAGE AND SANITATION

8

Physical Infrastructure

he quality of life in a settlement very much nds on the level of availability, accessibility and ty of infrastructure it provides. In a broad sense, ical infrastructure consists of municipal services utilities, namely, water supply, sewerage, sanita- and solid waste management. The rapid growth opulation necessitates planning and augmenta- of water supply, sewerage and sanitation mes in an integrated manner.

resent level of services: water supply

er is necessary for a healthy community and r urban activities. It is essential to provide good ty of drinking water accessible to all. In NCR, ivers Yamuna and Ganga are flowing through central part and along the eastern boundary of egion respectively, and are the major sources of water supply. Besides, the rivers Hindon, Kali and Sahibi and West Yamuna Canal and Ganga Canal are also being used as the sources of water supply. Other sources of water supply in the NCR are tube wells tanks and wells which serve small towns and rural settlements. The proposed Tehri Dam in Uttar Pradesh and Kishau, Lakhwar and Giri Dams in Himachal Pradesh when completed could provide a major share of NCR's water requirement upto 2001.

There are 94 urban settlements in NCR. Of these, 58 are in Uttar Pradesh, 27 in Haryana, 3 in Rajasthan and 6 in the Union Territory of Delhi. The present level of water supply in the Region is inadequate. As indicated in Table 8.1, out of the 88 settlements located in Haryana, Uttar Pradesh and Rajasthan, 3 have River Infiltration Gallery, 12 settlements are served by Service Reservoirs and 40 Over Head Tanks while 37 settlements do not have any water supply system at all.

e 8.1 Existing Sewerage, Sanitation and Water Supply in NCR Towns – 1981

e of Town	Popula-tion	System of Sewe-age	Number of Latrines				Method of disposal (Night Soil)	Protected Water Supply	
			Water Borne	Service	Others	Total		Source of supply	System of storage with capacity in lakh litres
1	2	3	4	5	6	7	8	9	10
Bahadurgarh	37448	S, OSD	84	2350	–	2434	S, WB	T, TK	I.G. (455.00)
Beri	13490	OSD	5	30	–	35	WB	T, TW	IG (2.30) OHT (1.50)
Bawal	7760	OSD	30	100	10	140	B, WB	TW, T	OHT (0.60) BWP – NA
Faridabad Complex	330860	S	5676	8000	–	13676	ST, S	TW, TK	OHT (63.70) SR (1.37)
Farukan Nagar	6367	OSD	10	600	–	610	WB	T, TW	OHT (2.30)
Ferozpur Jhirka	9400	OSD	50	500	5	555	WB	T, W	SR (4.10) OHT (1.80)
Ganaur	16489	OSD	–	995	2	997	WB,B	T,TW	OHT(2.30)

1	2	3	4	5	6	7	8	9	10
8. Gohana	26188	OSD	–	–	4500	4500	WB	T, TW	OHT (1.40)
9. Gurgaon U.A.	100877	S, OSD	3310	10422	13732	WB, S	WB, S M.L.	T, TW	SR (15.90) OHT (12.15) BWP (N.A.)
10. Hailey Mandi	10140	S, OSD	28	320	–	348	WB, S	T, TW	BWP (N.A.)
11. Hassanpur	5109	OSD	–	1200	–	1200	W B	T, TW	–
12. Hathin	6553	OSD	–	100	–	100	WB	W, TW	–
13. Hodal	18740	OSD PT	31	360	–	391	WB	W, TW	SR (7.96) BWP (N.A.)
14. Jhajjar	24247	S, OSD	–	4050	–	4050	WB, B	T, TW	OHT (1.36) BW (N.A.)
15. Jharsa	8412	–	–	45	–	45	H L	T, TW	BPW (N.A.)
16. Maham	11722	OSD	–	1500	500	2000	WB	T	PT (102.269) SR (1.82)
17. Nuh	5992	OSD	25	350	2	377	B	TW, TK	SR (4.10) OHT (1.37)
18. Palwal	47328	OSD, PT	–	4000	500	4500	WB, B	TW, TK	SR (22.75) OHT (2.45)
19. Pataudi	8422	OSD, PT	–	620	2	622	HL, WB	T, TW	–
20. Tewari	51562	S	250	6000	–	6250	WB, S	TW, T	O (27.30) OHT (4.55)
21. Rohtak	166767	S, OSD	1270	28004	–	29274	HL, WB	T, TW	O (10900.00) SR (34.58)
22. Samalkha	13352	OSD	–	–	–	–	B, WB	TW	–
23. Sohna	12667	S, OSD	290	525	–	815	WB, S	T, TW	SR (2.28)
24. Sonipat	109369	S, OSD	–	863	16848	17711	WB	T, TW	SR (4.37) OHT (2.73)
25. Taoru	6912	OSD, PT	8	10	19	37	WB	TW	OHT (0.68) BWP (N.A.)
26. Panipat	137927	OSD, S	1700	2500	–	4200	WB, B	W, TW	OHT (12.06) BWP (N.A.)
27. Kalanaur	12380	OSD	10	950	2	962	B, WB	T, TW	IG (3.60) BWP (N.A.)
28. Aminagar Sarai	6837	OSD	–	–	–	–	B/BW	T/TW	OHT (1.00)
29. Agarwalmandi	9353	OSD	–	–	–	–	HL	T/TW	OHT (0.15)
30. Aurangabad	11622	OSD	–	–	–	–	B	TW/W	–
31. Abdullapur	6383	OSD	–	8	–	8	WB	TW/W	–
32. Anupsanar	15193	OSD	–	–	–	–	B	TW/W	–
33 Bavan Bahadurnagar	6779	OSD	–	–	–	–	B	TW/W	–
34. Bugrari	8307	OSD	–	–	–	–	WB/B	TW/W	–
35. Bulandshahr	103436	OSD	–	–	–	–	WB	T/TW	OHT (15.93)
36. Bilaspur	4661	OSD	–	–	–	–	B	TW/W	–
37. Babugarh	2389	OSD	–	–	–	–	B/WB	TW/W	–
38. Bahsuma	7906	OSD	–	–	–	–	WB	TW/W	–
39. Baghpat	17157	OSD	–	4	–	4	WB	TW/T	OHT (4.50)
40. Baraut	46292	OSD	–	5	–	5	WB	T/TW	OHT (2.50)
41. Chhaprauli	13805	OSD	–	–	–	–	WB	T/TW	OHT (0.2
42. Doghat	10019	OSD	–	–	–	–	B/WB	TW/W	–
43. Daurala	9146	OSD	–	–	–	–	HL	TW/W	–
44. Dadri	19723	OSD	–	3	–	3	B/BW	TW/T	–

1	2	3	4	5	6	7	8	9	10
75. Dankaur	7935	OSD	–	–	–	–	WB/B	TW/W	–
76. Chhatari	5862	OSD	–	–	–	–	WB/B	TW/W	–
77. Debai	22430	OSD	–	–	–	–	WB	T/TW	OHT (2.28)
78. Gulaothi	24416	OSD	–	–	–	–	B	T/TW	–
79. Garhmukteshwar	17914	OSD	–	8	–	8	WB/ST	T/TW	OHT (2.28)
80. Faridnagar	9116	OSD	–	–	–	–	B	T/TW	–
81. Hapur	102837	OSD	–	4	–	4	WB/ST	T/TW	OHT (2.28)
82. Ghaziabad	287170	S/OSD	33	85	–	118	WB/S B/HL	T/TW	OHT (11.40)
83. Hastinapur	11637	OSD	–	–	–	–	W/B	T/TW	OHT (2.28)
84. Khedka	2691	OSD	–	–	–	–	HL	T/TW	OHT (1.82)
85. Karnawal	9895	OSD	–	–	–	–	HL	T/TW	–
86. Kakod	4299	OSD	–	–	–	–	B	T/TW	–
87. Khurja	67119	OSD	1	3	–	4	WB	T/TW	OHT (14.74)
88. Jewar	15275	OSD	–	–	–	–	WB/W	T/TW	–
89. Jahangirpur	6447	OSD	–	–	–	–	B	T/TW	–
90. jahangirabad	29301	OSD	–	4	–	4	WB	T/TW	–
91. Khanpur	8311	OSD	–	–	–	–	B	T/TW	–
92. Narora	9573	OSD	–	–	–	–	HL	T/TW	–
93. Niwadi	7078	PT/OSD	–	–	–	–	WB/ST	T/TW	OHT (1.80)
94. Loni	10259	OSD	–	–	–	–	HL/WN	T/TW	OHT (1.82)
95. Kitnaur	13791	OSD	–	–	–	–	WB	T/TW	–
96. Muradnagar	26042	OSD	–	–	–	–	B/WB	T/TW	OHT (3.41)
97. Modinagar	87665	OSD/PT	–	20	–	20	B/WB ST	T/TW	OHT (12.74)
98. Meerut	536615	OSD	40	24	–	64	HL/WB	T/TW T	OHT (1443.80)
99. Mawana	37620	OSD	–	4	–	4	WB	T/TW	OHT (N.A.)
00. Lawar	11535	OSD	–	–	–	–	HL	TW/W	–
01. Sardhana	30138	OSD	–	–	–	–	WB	TW/W	OHT (2.50)
02. Pamikshitgam	11328	OSD	–	–	–	–	HL	TW/W	–
03. Phalauda	10357	OSD	–	–	–	–	HL	TW/W	–
04. Shahjahanpur	8867	OSD	–	–	–	–	HL	TW/W	–
05. Sewalkhar	10278	OSD	–	–	–	–	HL	TW/W	–
06. Ordinance Factory Muradnagar	13147	Data not available							
07. patala	7847	OSD	–	–	–	–	WB/ST	T/TW	–
08. Pilkhua	37884	OSD	4	7	–	11	B/WB	W/TW	OHT (2.28)
09. Sikandrabad	43135	OSD	–	–	–	–	WB	TW/W	OHT (12.50)
10. Siana	22410	OSD	–	–	–	–	WB	TW/W	–
11. Shikapur	21499	OSD	–	–	–	–	WB	TW/W	–
12. panasu	9016	OSD	–	–	–	–	WB	T/TW	–
13. Rabupura	8999	OSD	–	–	–	–	HL	T/Tw	OHT (3.41)
14. Tikri	11315	OSD	–	–	–	–	B	TW/W	–
15. Kharkhoda	8708	OSD	–	–	–	–	WB	T/TK	OHJ (2.00)
16. Alwar	145795	OSD	NA	NA	NA	–	WB/ST	TW/W	SR (22.45)
17. Khairtal	15962	OSD	100	77	8	185	WB/B	W	OHT (2.25)
18. Tijara	12199	OSD	55	4	4	63	WB	TW/W	SR (4.50)

1	2	3	4	5	6	7	8	9	10

NA	Not Available	WB	Wheel Barrows	OHT	Overhead Tank
* S	Sewer	ST	Septic Tank Latrines	SR	Service Reservoir
OSD	Open Surface Drains	S	Sewerage	IG	River Infiltration Gallery
PT	Pit System	TW	Tube Well Water/Hand Pump	BWP	Bore-well Pumping System
HL	Head Load	W	Well Water	PT	Pressure Tank
B	Basket	TK	Tank Water	O	Others

Source: Town Directory, 1981 Census

8.2 Priority Towns

The analysis of Table 8.2 reveals that population coverage under water supply schemes in the priority towns varies from 30% in Bulandshahr to 100% in Panipat. Out of the 8 priority towns, 6 are served 100% by tube wells. The per capita daily water supply varies from 30.2 litres in Rewari to 131.6 litres in Panipat which indicates inadequate level of water supply in the priority towns. The present supply is much less than the desirable norm of 220 lpcd. The total deficiency of water supply has been estimated at 1663.4 lakh litres per day. An attempt has been made to work out the additional requirement of water supply for the assigned population of the respective towns for the year 2001. Total additional requirement in the 8 priority towns for 2001 has been estimated at 10025 lakh litres per day.

Table 8.2 Existing Water Supply and Additional Requirement of Water in Priority Towns by 2001

Towns	Popula-tion	Popula-tion covered (in %)	Source of Water Supply			Total supply daily (lakh litres	per capita supply (litres daily)	Defici-ency (lakh litres daily)	Popula-tion assig-ned for 2001(in lakhs)	Total additi-onal require-ment (lakh litres daily)
			Canal (in %)	Tube well (in %)	Others (in %)					
1. Meerut	536615	70	0.40	99.60	–	636.60	118.5	581.05	13.00	2314.40
2. Hapur	102837	50	–	100.00	–	116.90	113.7	116.50	6.00	1245.10
3. Bulandshahr	103936	30	–	100.00	–	74.50	711.5	160.00	10.00	2196.00
4. Palwal	47328	75	–	100.00	–	25.00	57.0	82.40	3.00	656.00
5. Rewari	51562	75	–	100.00	–	15.60	30.2	102.00	3.00	665.40
6. Rohtak	166767	60	100	–	–	100.00	59.9	278.60	5.00	1035.00
7. Panipat	137927	100	–	70.00	30	181.50	131.6	131.50	5.00	953.50
8. Alwar	145798	NA	–	100.00	–	175.00	120.0	210.90	5.00	560.00
Total	1292267	–	–	–	–	1324.60	102	1663.40	50.00	10025.40

Note: The deficiency and future requirement of water have been worked out on the basis of 50 gallons (227 litres) per capita per day

8.3 Broad Recommendations for Development of Water Supply in NCR

The supply of drinking water should be made available to the priority towns in the first phase and to all the towns and rural settlements in the second phase.

To meet the additional requirement of water supply of 10025 lakhs litres per day in the priority towns, existing sources of water supply have to be tapped to the optimum level and water should be efficiently distributed on a unified basis.

The development of most of the water supply sources would require inter-state cooperation. Problems of water supply should be dealt in a unified manned for the NCR as a whole. A survey to

ness the ground water yield would be undertaken n priority basis. It would be necessary to plan, sign and implement and maintain all water supply hemes in an integrated manner for NCR.

Sewerage and Sanitation

Sewerage treatment is essential to check environntal decay as well as to maintain the healthy living nditions. It is evident from Table 8.1 that the existlevel of sewerage system is grossly inadequate in R towns. Out of the 88 towns outside Delhi UT in Region, only 2 have underground sewerage sys-, 9 have sewerage and drainage system and 9 e pit system and open surface drains. As many as towns do not have any sewerage system at all cept for open surface drains in some of them.

The method of disposal of night soil in most of the tlements is very un-hygienic and primitive, being nservancy system basket, wheel barrows, etc. The le 8.1 shows that the septic tank and sewer as a tem of disposal of night soil is available in 13 vns, while the majority of the towns use wheel rrows for disposal of night soil.

Priority Towns

The existing sewerage system in the selected ority towns is highly inadequate. As indicated in Table 8.3 that all the priority towns except landshahr are partly covered by under-ground verage system. Bulandshahr in the Uttar Pradesh -region does not have under-ground sewerage tem. In all the priority towns, sewerage is posed off after primary treatment in the open ds except in Rewari, where it is utilised for irrigan purposes after treatment.

Table 8.3 Existing Sewerage Facilities in Priority Towns

Towns	Type of sewerage system	Type of disposal	Treatment given
1. Meerut	Underground + OSD	Open field	Primary
2. Hapur	Underground (25%)+OSD (75%)	Open fields	Primary
3. Buland shahr	Open surface Drainage	Open fields	Primary
4. Palwal	Underground (10%) + OSD	Open fields and Nala	Untreated
5. Rewari	Underground + OSD	Open field Broad Irrigation Septic tanks	Fully treated
6. Rohtak	Underground + covered drainage	NA	NA
7. Panipat	Underground (25%) + OSD	Open fields	Primary
8. Alwar	N.A.	N.A.	N.A.

NA–Not Available

8.6 Some Broad Measures for Improvement of Sewerage and Sanitation

Detailed Plan for sewerage schemes, solid waste management and sanitation should be prepared for the priority towns and adequate funds arranged for implementation of schemes.

The settlements where regular sewerage schemes are not available, low cost sanitation system for individual family should be adopted as a short term measure.

Strict enforcement of Water Pollution Control Act of 1974 is required immediately. The complete treatment of waste water before discharging it into the rivers, would help controlling pollution and maintaining better environment.

FISCAL POLICY AND ECONOMIC ACTIVITIES

9

Among the various policies which would be necessary for an integrated development of the National Capital Region, fiscal policy needs immediate attention. With the formation of the statutory National Capital Region Planning Board, a stage has been set for the implementation of the plan proposals set out by the Board in the Interim Development Plan. In the nature of things, development of the Region as conceived in the Plan involves inter-State jurisdictions and their cooperation. Tax differentials, beyond what are usually met at intra-State level, are another important aspect of the peculiar jurisdictional set up of the National Capital Region.

According to the Constitution of India, the power to levy taxes on the sales or purchases of goods, other than News-papers is vested with the States provided such sales and purchases do not take place in the course of inter-State trade. In the latter case, the power to levy tax vests with the Union Government, while the tax proceeds are assigned to the States where such sales originate. To note another exception, in respect of textiles, tobacco and sugar, the States have, since 1957, abdicated their powers to levy tax in favour of the Government of India which levies an additional excise (Goods of Special Importance Act, 1957) in lieu of sales tax formerly levied by the States and, the net proceeds are wholly assigned to the States in accordance with the recommendations of the Finance Commissions set up from time to time. As a result of this division of power, sales of goods in the National Capital Region are governed by different sets of tax laws. On the one hand, there is local sales tax law in each State/Union Territory which is applicable to the local dealings and, on the other, there is Central Sales Tax governed by the provisions of Central Act, 1956.

One of the problems confronting the existing structure of sales tax relates to the lack of uniformity of rates. This causes diversion of trade as well as shifting of manufacturing activity from one State to another. In the context of balanced development of the national Capital Region, it has been pointed out at various forums that the lower sales tax rates in Delhi as compared to the adjoining States, particularly Haryana, Rajasthan and Uttar Pradesh have been contributing to the concentration of distributive trades in Delhi. It is being argued that these differentials in tax rates added with advantage of better social and physical infrastructure in Delhi have greatly influenced in past the decision making regarding location of industry and trade. In this respect, it is pertinent to point out that in Delhi, foodgrains and pulses are exempted from levy of tax whereas in the neighbouring States of the National Capital Region, these attract taxation at the rate of 4%. Kerosene, matches and handmade paper and several other commodities of general nature are taxable at the rates varying from 3% to 5% in Delhi whereas, these commodities, in the neighbouring States of the National Capital Region, attracts taxation at higher rates of 7% to 8%. A list of comparative taxes in respect of Delhi and Urrat Pradesh on various commodities is given in Table 9.1.

It would be observed from the list that there is a wide variation in the rates of tax. In some commodities, the difference is as much as 12%. In articles where the margin of profits is low and transport costs are not so high, such a variation results in attracting buyers even from far off places. Thus, in the case of consumer articles, there is need for reducing the variation in taxes. In the case of industrial raw material and industrial machines etc., there is need for even a higher rate of taxation in the Union Territory of Delhi. This will be in harmony with the earlier policies proposed on industrial locations.

To achieve the above objectives, the following policies are proposed:

1. In order to achieve uniformity to some extent in tax structure in the National Capital Region

Delhi Union Territory should have minimum floor level of taxation.

ii. The tax structure of the Union Territory of Delhi should be so adjusted that the tax on industry raw materials and industrial machinery is slightly more than that in the rest of the Region.

The other important aspect with regard to differentials in tax structure in Delhi and the neighbouring States of the National Capital Region is the fact that in Delhi, on the re-export of goods which are received in Delhi, a lower rate of 2% tax is levied whereas, in the neighbouring States of Haryana, Rajasthan and Uttar Pradesh, such re-export of goods are taxed at the normal rate of 4%. This concessional rate of 2% has again resulted in large scale diversion of trade to the UT of Delhi. In order to save diversion of trade from the neighbouring States to Delhi, the present rate of taxation of 2% levied on re-export of goods in Delhi should be raised to 4% as is being levied in the three neighbouring States of Haryana, Rajasthan and Uttar pradesh.

It may also be pointed out that the concentration of wholesale distributive trade in Delhi is also the direct result of the approved practice of stock transfers and consignment despatches to Delhi from places outside Delhi. Most of the manufacturers and big traders have opened their sales offices and godowns in Delhi where they store goods brought from outstations and effect sales thereof. This practice not only deprives the States from where the goods originate from the tax revenue which would have otherwise accrued to them, but has also created alarming locational problems of trade and commerce in Delhi. The Law Commission of India, after studying this problem of consignment despatches and stock transfers, besides other connected problems referred to it by Government of India, made its recommendations through the 61st report. Pursuant to the recommendations made by the Law Commission of India to help the States curb the practice of avoidance of payment of sales tax on this account, the Government of India amended the Constitution of India through the 46th Constitutional Amendment Act 1982 which inter-alia provides for levy of tax on inter-State consignment or stock transfers through an enactment to be passed by the parliament. The 46th Constitutional Amendment Act 1982, received the assent of the President of India on 2nd February 1983. The matter about follow up legislation has been discussed by the Government of India at various levels including in the Chief Ministers Conference held number of times in the past. In the Conference held on 28th May, 1984, after detailed discussions, the following resolution was adopted:

"The Conference of Chief Ministers held on 28th May 1984 approved by consensus the following course of action regarding levy of taxes on the consignment of goods taking place in the course of inter-State trade or commerce:

i. Endorse the recommendations made by the Group of Chief Ministers at the meeting held on 24th march 1984 at New Delhi in respect of:

   a) Rate of tax.
   b) Machinery for collection of proceeds of consignment tax ,and
   c) Valuation.

ii. As regards assignment of proceeds of consignment tax, 50% is to be retained by the collecting State and the remaining 50% to be placed in the divisible pool, the proceeds of which will be distributed amongst the States as per formula applicable for distribution of basic Excise Duties or such formula as may be devised in future for the purpose by a Finance Commission. Since the Union Territories have their budget funded wholly by the Centre, this arrangement will not apply to the Union territories.

iii. In respect of exemptions, the power to grant exemptions can vest in the States, on the pattern applicable to Central Sales Tax. But the Union Government will formulate the appropriate guidelines about the same after consultation with State Governments.

Further, that legislation to implement the above be introduced at the earliest opportunity".

The recommendations of the Group of Chief Ministers about the rate of tax, machinery for collection of the proceeds of consignment tax and valuation has been as under:

a) The proposed consignment tax should be levied at the rate as Central Sales Tax;

b) Machinery of assessment should be the same as the one existing in respect of the Central Sales Tax; and

c) Valuation of consignment transfers should be on the pattern adopted in respect of levy of Cental Excise Duty.

Since then, however, no follow up legislation has come further from the Government of India to levy tax in inter-State consignments.

It is felt that non-levy of consignment tax is resulting in diversion of trade from other States to Delhi. It is, therefore, considered necessary that the Government of India take immediate steps as follow up action with regard to the 46th Constitutional Amendment Act 1982 as per the recommendations of the Group of Chief Ministers Conference.

Table 9.1 Sale Tax Rates in the Constituents of NCR

Commodity		Delhi	Haryana	Uttar Pradesh
1		2	3	4
1.	Arms & Ammunitions	10	10	14
2.	Atta, Maida, Suji	E	4	4
3.	Article made of Gold and Silver	7	2	6
4.	Aviation Spirit	10	—	—
5.	Aluminium wares extrusions	7	7	8
6.	Air-Conditioner, its plants & Equipments	10	10	12
7.	Asbestos, Cement, Corrugated sheet, etc	7	—	8
8.	Belting of all kinds	7	—	8
9.	Bhang, Ganja & Charas	7	—	E
10.	Bicycle, Tricycles	7	—	8
11.	Binocular Telescope	10	12	12
13.	Bricks, Fire bricks	7	—	8
13.	Brass wares and Utensils of brass	7	—	10
14.	Bullion and spices	1/2	1/2	2
15.	Butter cream cheese	E	7	5
16.	Bread	E	7	5
17.	Biscults			
	(1) Hand made	7	7	5
	(2) Others	7	7	5
18.	Betal leaves	E	E	E
19.	Clocks, Time Pieces	10	12	12
20.	Card Board Straw Board	7	—	10
21.	Caustic soda and Soda Ash	7	7	8
22.	Carpets Namdas	10	—	10
23.	Cement(all kinds)	7	12	10
24.	Chemicals	7	7	8
25.	Cigarettes, cases and Lighter	10	12	12
26.	Cinematographic goods	10	12	12
27.	Coffee, Cocao, Chicory	7	8	8
28.	Crockery, Cutlery	10	10	10
29.	China-ware, Stone galzed -ware, porcelain-ware	10	10	10
30.	Chemical Fertilizers	E	E	5
31.	Corks	7	7	4
32.	Container made of tin, iron steel	7	7	4
33.	Cotton carpets, piled durries	10	12	6
34.	Cotton rugs, Rezais, Lihaf etc.	5	7	6
35.	Cotton waste	5	4	4
36.	Cereals	E	4	4
37.	Country Spirit	7	E	E
38.	Cane goods other than furniture	7	7	E
39.	Coal	3	4	4
40.	Cotton	4	4	4
41.	Cotton yarn	1	2	2
42.	Crude Oil	4	—	4
43.	Cosmetics and toilet preparations	10	12	12
44.	Chillies	7	—	8
45.	Candle	7	8	8
46.	Chassis of heavy vehicles	10	—	10
47.	Cooking gas	5	—	8
48.	Copper-wire	—	7	4
49.	Cooking food	E	—	5
50.	Camphor	—	—	8
51.	Cotton Yarn Waste	5	—	8
52.	Cardamom	7	—	8
53.	Cashew Nut	7	—	10
54.	Dyes and Colours	7	7	8
55.	Dry fruits	7	7	10
56.	Electrical goods	10	10	12
57.	Exercise books	E	E	6
58.	Electroplated nickel-silver goods	7	—	—
59.	Electric motors	10	10	12
60.	Exhaust fan air circulators	10	—	12
61.	Fire work coloured matches	10	—	12

1	2	3	4
62. Fountain pen, etc	5	–	8
63. Furniture (Wooden)	10	10	12
2-(Others)	10	12	12
64. Fur and Article made thereof	10	12	12
65. Firewood	E	8	4
66. Footwear of all kinds	5	8	8
67. Furnance Oil	7	8	8
68. Goods and ware-made of glass	10	–	12
69. Glass bangles	5	10	10
70. Gas lanterns, Petromax	5	10	8
71. Goods for indoor or outdoor games	7	–	6
72. Gota, Lachha Salma Sitara Embroidery	7	7	E
73. Ghee	5	8	6
74. Gur Gursakker Rab	7	8	8
75. Groundnut Oil	5	–	4
76. Goat Hair	7	7	E
77. Generators and transformers etc.	10	–	12
78. Hides and Skins	4	4	4
79. Hard Board	10	10	10
80. Hoses made of rullers, plastic & cement	7	–	8
81. Hosiery (1) Cotton	1/5	2	4
(2) Others	1/5	–	8
82. High Speed Diesel Oil	10	–	E
83. Iron and Steel	4	4	4
84. Ivory goods	7	7	8
85. Instrument Boxes and Maps	E	–	E
86. Ice	5	7	8
87. Jute	4	4	4
88. Jute and hemp goods	5	–	6
89. Jars of all kinds	–	–	E
90. Kerosene Oil			
(Inferior)	3	7	8
(Superior)	3	7	8
91. Knitting Yarn (All)	5	7	8
92. Khandsari Sugar	E	–	4
93. Leather Board	10	10	10
94. Lubricants	9	7	8
95. Locks parts and keys	7	7	8
96. Leather goods			
(1) Ladies hand bag variety purses	10	10	8
(2) Other goods	10	10	8
97. Light diesel oil	10	–	E
98. Linolium	7	–	E

1	2	3	4
99. Lack and Sallak	7	7	E
100. Lifts operated by power	10	10	12
101. Machinery Spare parts	7	7	6
102. Matches	4	8	6
103. Mill stores and Hardwares	7	7	8
104. Molasses	5	–	12
105. Motor vehicles etc. and parts			
(1) Motor cars and light Commercial Vehicles	10	12	10
(2) Motor Parts	10	12	10
106. Medicine and Pharm. preparations	5	8	6
107. Milk Powder, Condensed Milk	5	8	6
108. Meat, Fish	E	–	E
109. Motor Spirit as defined in UP Motor Spirit Diesel Oil and Alcohol Taxation Act	10	W	E
110.Musical Instruments	7	7	8
111. Marble and its products	7	7	8
112. Mica	7	7	4
113. Mangenese	7	7	4
114. Margarine	5	8	12
115. Non-ferrous metals sheets ingots, circles alloy, etc.	7	–	2
116. Office machinery such as tabulating, calculating machines, duplicating machines etc.	10	12	12
117. Oil of all kinds other than those covered by any other Notification	5	–	5
118. Oil seeds	3	4	4
119. Ornaments made of gold and silver	2	–	4
120. Opium	7	–	20
121. Paints and Varnish	7	7	12
122. Pearls	7	7	10
123. Photographic goods	10	–	12
124. Plastic goods	5	10	8
125. Playing cards	7	7	9
126. Polishes of all kinds	5	12	8
127 Packing Material			
1) Empty tin Empty Bravel	7	–	4
2) Wooden boxes and Cartoons	7	–	6
3) Empty bottles	7	–	4
4) Polythene and Alkaline	7	10	8
128. Plywood	10	10	10
129. Paper of all kinds	5	8	6
130. Pulses	E	–	4
131. Pesticides & Insecticides	5	2	6

1	2	3	4
132. Potash Explosives	7	7	8
133. Paper	7	—	8
134. Pressure Cooker	7	—	8
135. Pure silk cloth other than handloom	3	—	8
136. Rubber, etc.	7	—	8
137. Refined Coconut Oil, Ground-nut Oil	5	8	10
138. Refrigerator, Plants Equipment	10	10	12
139. Raw wool	2	2	4
140. Readymade garments			
1) Woollen	2/5	8	6
2) Others	2/5	—	—
141. Sheets, Cushion Pillow, Mattresses, etc.	10	7	12
142. Sanitory Goods	10	—	12
143. Scents, Perfumes	10	—	—
144. Spirits and Spirituous Liquors of all kinds	10	20	26
145. Soda-water, Soft Bewerages, Syrups, Squashes, Lemon Soda, etc.	7	9	12
146. Sun-Glass-Sun-Goggles, Spectalces.	7	—	8
147. Saw dust charcoal cake briquettes	E	—	4
148. Sewing or Embroidery thread	3	2	2
149. Spices and Condiments	7	8	8
150. Sinfease attache cases	7	1	8
151. Stoves	7	7	8
152. Sewing machines	7	7	8
153. Starches	7	7	8

E: Exempt

M: Sale of Manufacturer

1	2	3	4
154. Stationery	7	—	8
155. Staple Yarn of all kinds	E	—	2
156. Soap	5	—	8
157. Shaving sets, Safety Razors, etc.	5	—	8
158. Taps	—	—	4
159. Tractors and Parts	5	—	2
160. Tea	7	8	8
161. Tendu(Kendu) Leaves	7	7	8
162. Tjles of all kinds	10	12	12
163. Torch cells, Dry cells, Batteries	5	7	12
164. Tyres and Tubes	7	—	8
165. Timber (wood)	7	7	12
166. Tooth-paste, Tooth powder	5	—	8
167. Tooth brushes, etc.	5	—	8
168. Vacuum Flasks (All)	10	12	12
169. Vanaspati	5	8	10
170. Umbrellas	5	—	8
171. Washing soap and other material	5	12	6
172. 1) Wireless transmission and reception equipment	10	12	12
2) Sound recording equipment	10	12	12
3) Sound Transmitary equipment and audio, video, electric equipment	12	12	12
173. Wire made of stainless steel	7	7	12
174. Welding electrodes and Rods	7	10	8
175. Weighing machine, etc.	7	—	8
176. Yarn of all kinds (Except those notified)	2	—	2
177. X-Ray apparatus and films	10	—	8
178. General rate of tax	7	—	8

TENTATIVE FINANCIAL IMPLICATIONS OF THE INTERIM DEVELOPMENT PLAN

10

The detailed investment plan for the National Capital Region has to be evolved from the Comprehensive Regional Plan which is under preparation. Pending that, tentative cost estimates based on the proposals that emerged from the Interim Plan have been woked out. These proposals are expected to bring about organised development of the Region. Cost estimates for individual projects/works given here are tentative and, financing and implementation would have to be preceded by project/work reports. In case of Area programmes, estimates have been made separately for concerned area/town. Cost estimates in case of sectors such as power development will have to be worked out in consultation with the concerned States.

10.1 Land Acquisition and Development

The 'Priority' and Delhi Metropolitan Area towns have to accommodate 87 lakh persons by 2001. This calls for acquisition of new lands as well as developing them in these towns so that they can accommodate the additional population. Assuming a density of 125 persons per hectare, the total area of land that needs to be acquired to accommodate the additional population (64.72 lakhs) works out to about 52,000 hectares.

The cost of land acquisition and development varies from town to town. In order to estimate the total cost of land acquisition and development, the average cost of land acquisition and development has been assumed as Rs. 8 lakhs per hectare (Rs. 1 lakh for acquisition and Rs. 6 lakhs for development) for residential areas; Rs. 4 lakhs per hectare (Rs 2 lakhs for acquisition and Rs. 2 lakhs for development per hectare) each for industrial and commercial area and Rs. 3 lakhs per hecate (Rs. 2 lakhs for acquisition and Rs. 1 lakh for development) for 'other' areas. On the basis of these assumptions, the total cost of land acquisition and development works out to about Rs. 2700 crores. This, however, does not mean that the allocation needed for land acquisition and development is Rs. 2700 crores. This is because the land acquisition and development scheme is a remunerative one as it generates revolving funds: Once a piece of land is developed, it can be sold out and the amount thus realised can be more than the actual development cost.

The seed money required for land acquisition and development works out to about Rs. 1010 crores. This has been worked out on the basis of the following assumptions:

i. The proportion of area required for various uses.

Residential	:	40%
Commercial	:	6%
Industrial	:	15%
Others	:	39%

ii. The land required is acquired and developed within a peroid of 10 years.

iii. The land required for residential use in a particular year is developed in the following two years and that from the third year (leaving the year of acquisition), revenue from sale of land equivalent to one fifth of the land acquired in the first year multiplied by Rs. 12 lakhs per hectare starts accruing.

iv. The land acquired for industrial purposes in a particular year is developed in the following year and that from the second year, one-fifth of the cost incurred in acquisition and development of the land acquired in the first year, is realised.

v. The land acquired for commercial purposes in a particular year is developed in the next year and is sold out (at the cost price) in the third year.

vi. The land acquired ror 'other' uses in a particular year is developed in the subsequent year. The sale price of residential plot has been assumed at Rs. 12 lakhs per hectare to cover the cost of development of land falling under the category of 'others'. Hence, the 'residential and other' uses have been combined while working out the seed money required for land acquisition and development.

The town-wise position is as in Table 10.1

Table 10.1 Estimate of Fund Requirement for Land Acquisition and Development in Priority and Delhi Metropolitan Area Towns

Sl. No.	Name of Town/Urban Complex	Population in lakhs 1981	Assigned population for 2001 in lakhs	Additional population to be accommodated in lakhs	Land required in hectares to accommodate the additional population (round off to the next ten)	Total cost of land acquisition and development @ Rs. 5.21 lakhs per hectare	Actual seed money required for land acquisition and development @ 1.95 lakhs per hectare.
						(Rs. in crores)	
I.	**Priority Towns**						
1.	Meerut	5.37	13.00	7.63	6110	318.33	119.14
2.	Hapur	1.03	6.00	4.97	3980	207.36	77.61
3.	Bulandshahr-Khurja Complex	1.70	10.00	8.30	6640	345.94	129.48
4.	Palwal	0.47	3.00	2.53	2030	105.76	39.59
5.	Panipat	1.38	5.00	3.62	2900	151.09	56.55
6.	Rohtak	1.67	5.00	3.33	2670	139.11	52.07
7.	Rewari Complex						
	a) Rewari						
	b) Dharuhera	0.52	3.00	2.48	1990	103.68	38.81
	c) Bhiwadi (Rajasthan)						
8.	Alwar	1.46	5.00	3.54	2840	147.96	55.38
	Sub Total (I)	13.60	50.00	36.40	29160	1519.23	568.63
II.	**Delhi Metropolitan Area Town**						
1.	Ghaziabad including Loni	3.00	11.00	8.00	6400	333.44	124.80
2.	NOIDA	0.75	5.50	4.75	3800	197.98	74.10
3.	Faridabad Complex	3.31	10.00	6.69	5360	279.26	104.52
4.	Gurgaon	1.00	7.00	6.00	4800	250.08	93.60
5.	Bahadurgarh	0.37	2.00	1.63	1310	68.25	25.55
6.	Kundli	0.25	1.50	1.25	1000	52.10	19.50
	Sub Total (II)	8.68	37.00	28.32	22670	1181.11	442.07
	Grand Total (I + II+)	22.28	87.00	64.72	51830	2700.34	1010.70

* Figures pertain to Rewari only

10.2 Regional Transport

Roads:

Improvement to road network includes development of the stretches of NH-1 (Delhi-Panipat), NH-2(Delhi-Palwal), NH-10(Delhi-Rohtak), NH-8(Delhi-Gurgaon), NH-24(Delhi-Hapur) and widening the existing State Highway between Ghaziabad-Meerut to four lane-divided c/w (to be known as M-I motorway) with a r/w of 100 metres within National Capital Region including laying of service roads in the built up area. This would cost approximately Rs. 140 crores. This includes the cost of improvement of the existing National Highway and upgrading the State Highway stretch between Ghaziabad and Meerut to M-I standards. However, development of NH stretches to the level of M-I standards would need detailed technical feasibility studies for various stretches and as such cost requirements may vary.

Development of an inner and outer grid system of roads of the standard of M-II motor-ways with certain common stretches which would be of two lane c/w initially with r/w of 60 metres and to four lane c/w finally when the traffic needs justify it. The inner grid is to follow the alignment of Sonepat–Baghpat–Meerut–Hapur–Bulandshahr–Sikandrabad–Faridabad – Gurgaon – Jhajjar – Rohtak – Gohana – Sonepat. The outer road system would connect Panipat –Muzaffarnagar – Meerut – Hapur – Balandshahr – Khurja – Palwal – Rewari – Jhajjar – Rohtak – Gohana – Panipat.

a) Inner grid:

Sl. No.	Stretch	Length in km.	Cost (Rs. in lakh) including widening, strengthening of bridges and by-passes wherever required.
1	2	3	4
1.	Yamuna-bridge-Baghapat-Meerut	53	611.71
2.	Bulandshahr-Sikandrabad	13	117.00
3.	Sikandrabad-Dankaur	17	216.31
4.	Dankaur-Yamuna Bridge-Faridabad	–	1360.00
5.	Faridabad-Yamuna River	18	704.45
6.	Faridabad-Gurgaon	38	954.00
7.	Gurgaon-Jhajjar	45	667.00
8.	Jhajjar-Sonepat	35	515.00
9.	Sonepat-UP Border	20	1715.95
	Total cost for inner grid:		6861.42

b) Outer grid:

1.	Yamuna Nagar-Muzaffar Nagar-Meerut	107	1045.16*
2.	Meerut-Hapur-Bulandshahr	69	715.74
3.	Bulandshahr-Khurja	19	171.00
4.	Khurja-Yamuna Bridge	45	540.79
5.	Yamuna Bridge-Palwal	15	754.85
6.	Palwal-Sohna-Rewari	76	1695.50
7.	Rewari-Jhajjar-Rohtak	86	2198.40
8.	Rohtak-Gohana-Panipat-Sonauli	93	1925.00
	Total cost for outer grid: (excluding item 1)		8001.28

* to be financed by the concerned State Government

Total cost :Rs. 148.62 crores

c) Development of M-II motor way between Rewari-Alwar:

Development of this 70 km stretch would cost approximately Rs. 3.5 crores (@ Rs. 5 lakhs per km.)

Road structure in the Region would be evolved in consonance with the policy of developing four tier system of settlements. Efforts would be to inter-connect the same order centres directly with each other and the lower order centres to their nearest higher order centres. A system of feeder roads of higher standards would be evolved to connect the work centres/industrial estates with the nearest Regional or Sub-regional settlements.

Rail

The Plan envisages:

i. Development of Regional rail by-pass; This would pass through Meerut, Hapur, Bulandshahr, Khurja, Palwal, Sohna, rewari, Jhajjar, Rohtak and Panipat. The line between Meerut and Khurja is existing and that between Rohtak and Panipat has been restored. The remaining length of the link (205 km from Khurja to Rohtak) needs to be developed.

Total Length : 205 km.
Total Cost : Rs. 136 crores.

ii. Conversion of existing low capacity metre guage railway system into high capacity system between Delhi-Alwar.

iii. Identification of and location decision on another rail terminal to decongest and solve the traffic problems faced by the existing terminals.

iv. Completion of electrification along the raidal corridors, viz., Delhi-Panipat, Delhi-Meerut beyond Ghaziabad and Delhi-Rohtak beyond Shakurbasti. The details are:

Stretch		Details of work	Cost in lakhs
a.	Delhi-Panipat (88 km)	i. Electrification and revising of platforms, FOB, etc.	1200
		ii. Automatic colour lighting, signalling subzi-mandi Sonepat, Panipat	300
		iii. Terminal facilities at Panipat including information system, etc.	200
		iv. Staff Quarters	300
b.	Delhi-Meerut beyond Ghaziabad	Doubling from Muradnagar to Meerut and electrification and raising of platforms, FOBs and signalling installation etc.	1500
c.	Delhi-Rohtak beyond Shakurbasti	Electrification, Raising platforms, FOBs, including signalling installation	1200
		Total Cost : Rs. 47 crores.	

v. Operation of EMU Services at on the corridors the desired frequency as under:

	Stretch	Requirements*	Cost Rs. in lakhs
i.	Delhi-Panipat	5 Rakes-15 MC, 30 TC.	800
ii.	Ghaziabad-Meerut	4 Rakes-12 MC, 24 TC.	600
ii.	Shakurbasti-Rohtak	5 Rakes-15 MC, 30 TC.	800
	Total Cost	: Rs. 22 crores.	

* Requirements as in 1983. Refined assessment would be made after detailed studies.

vi) Operation of EMU Services on the ring with required frequency, initially with a lead time of 25 minutes in peak period/direction alongwith extension of EMU Services on three selected corridors (radially) viz., i) Delhi-Ghaziabad, ii) New Delhi-Palwal and iii) Delhi-Shakurbasti which are already electrified, replacing all the shuttle services to Shakurbasti, Ghaziabad and Palwal.

	Stretch	Requirements*	Cost Rs. in lakhs
i.	**Ring Railway in Delhi Urban Area	Rolling stock of 24 coaches ie. 8 MC, 16 TC.	500
ii.	Delhi-Ghaziabad	27 coaches-9 MC, 18TC.	500
iii.	New Delhi-Palwal	5 Takes-15 MC, 30 TC.	800
	Total Cost (excluding item i)	: Rs. 13 crores.	

* Requirements as in 1983. Refined assessment would be made after detailed studies.

** Finance to be managed by Delhi Administration/ Delhi Development Authority.

vi. Development of infrastructure inputs required for the operation of EMU services in selected corridors. This would involve some additional stations to be opened and certain other inputs besides raising of platforms to suit EMU coach operation. The corridors and actions needed in respective corridors are:

	Corridor	Station to be opened	Inputs required	Cost Rs. in lakh
1)	a. Delhi-Shahdara-Ghaziabad	Gandhinagar, Shaym Lal College	Creation of new halt station and removal of the infringements to suit EMU	50
	i. Stations inside Delhi UT*	Giani Boarder		
	ii. Stations outside Delhi UT	Mohan Nagar		
	b. New Delhi-Ghaziabad*	Shakarpur BEL	Creation of crossing and halt stations	60
2)	New Delhi-Palwal	Junction Cabin	Creation of halt stations	12
3)	New Delhi-Shakurbasti*	Rampura Cabin	Creation of halt stations	12
4)	Lengthening of platforms for 25 bogies at Delhi New Delhi stations.*			20
6)	Provision of independent double line between Delhi-New Delhi-Kishanganj-Delhi and Subzi Mandi.*			500
7)	Doubling and electrification of Dayabasti, Azadpur Section*			600
8)	a. Two more lines between Ghaziabad and Maripet car shed b. One more additional line (4th line) between Sahibabad and Ghaziabad			800
9)	Extension of 4th line from junction cabin to Palwal			1000
10)	a. Automatic signalling between Tughlakabad and Palwal			300
	b) Staff quarters and office building			300
	Total Cost			Rs. 2445 crores.

* To be financed by DDA/Delhi Administration.

viii. Augmentation of Delhi Transport Corporation fleet to provide feeder service to EMU service and evaluation of introduction of new rapid high capacity mass transport system for smooth intra-urban travel and improving the efficiency of ring and radial rail services.

ix. Feasibility evaluation/Techno-economic studies for the development of existing/new corridors and extension of existing corridors in the lines:

i.	Ghaziabad-Khurja	:	For EMU services.
ii.	Ghaziabad-Hapur	:	For electrification and EMU services.
iii.	Dayabasti-Azadpur	:	New electrified line and EMU services.

x. Extension of ring railway services to Ghaziabad on the east, Palwal to the south, Indira Gandhi Airport and Rohtak on the south-west and west and towards Panipat in the north.

xi. Development of integrated metropolitan terminals in the areas of a) Trans-Yamuna, b) Okhla, c) Bharthal and d) in North Delhi. Locational and other techno-economic studies for these terminals may be taken up immediately.

xii. Evaluation of possibilities for the extension of air services to the priority towns through short distance carriers.

xiii. The following main criteria would be taken into consideration besides the cost component:

The needs of priority areas and new development and extension areas,

The extent of which such proposals would aid the objective of decongesting Delhi and would help in taking away to or generating activities in the outer areas of the Region, and

benefits that such proposals would accrue for the existing industry and commerce for their expansion and exployment generation.

xiv. In selecting locations for new loading and unloading facility centres, priority and preference would be for locations that have greater potential/ capacity to drain and diverge out maximum traffic.

xv. Formation of a single unified Transport Authority which may, besides other things, formulate and take actions regarding fare structure of different modes, their gradation and combination.

xvi. Provision of telecommunication facilities for the priority towns and Delhi Metropolitan Area towns would cost about Rs. 280 crores. However, some of the programmes costing about Rs. 70 crores have already been included in the Department of Telecommunications, Ministry of Communications in the Seventh Plan budget.

While cost involvement for many of the programmes are yet to be made after detailed studies, total cost for the programmes under Transport and Telecommunications sector for which approximate cost has been worked out at Rs. 672.57 crores.

10.3 Development of Economic Activities

It is proposed to allocate Rs. 100 crores for various projects to be undertaken in the Sub-regions of the National Capital Region to promote economic activities which would generate employment and provide an economic base to the towns that will be taken up for priority development. The types of projects will have to be decided on a case to case basis after identifying the potential and the resources of the area and types of activities that are planned to be promoted there. However, the following types of projects would form part of the package:

a) The establishment of wholesale trade and marketing in commodities which are at present concentrated in Delhi,
b) the promotion and centration of the production of various consumer needs of Delhi,
c) setting up of industrial complexes and
d) setting up of office complexes.

10.4 Water supply, Sewerage and Solid waste disposal

The cost for development of physical infrastructure excluding power in the National Capital Region has been estimated at Rs. 1258.41 crores. Out of this, the share of selected priority towns and Delhi Metropolitan Area towns would be Rs. 725.14 crores and Rs. 533.27 crores respectively. (Table 10.2).

Out of the total anticipated cost of Rs. 1258.41 crores, the share of water supply will be Rs. 527.08 crores (41.88%) and solid waste disposal Rs. 87.00 crores (6.92%).

10.5 Priority Towns

Provisions of water supply etc. in eight priority towns is likely to cost Rs. 725.14 crores. Of this the cost of development of Meerut is likely to be Rs. 173.93 crores (23.98%), Hapur Rs. 91.35 crores (12.60%) and Bulandshahr-Khurja complex Rs. 151.63 crores (20.91%), Palwal Rs. 46.23 crores (6.37%), Panipat Rs. 70.60 crores (9.74%), Rohtak Rs. 71.53 crores (9.86%) and Rewari Complex Rs. 46.06 crores (6.36%) and Alwar 73.80 crores (10.18%). Thus the share of Uttar Pradesh Sub-region is likely to be Rs. 416.91 crores (57.49%), Haryana Sub-region Rs. 234.42 crores (32.33%) and Rajasthan Sub-region Rs. 73.8 crores (10.18%).

The anticipated cost of water supply at 227 litres per capita per day for assigned population of 2001 AD for eight priority towns is likely to be Rs. 300.76 crores (41.48%), sewerage Rs. 225.40 crores (31.08%), storm water drainage Rs. 148.98 crores (20.54%) and solid waste disposal Rs. 50.00 crores (6.90%).

10.6 Delhi Metropolitan Area Towns

Development of six Delhi Metropolitan Area towns is likely to cost Rs. 533.27 crores. Of this the cost of development of Ghaziabad (including Loni) is about Rs. 157.41 crores (29.52%), NOIDA Rs. 84.71 crores (15.88%), Faridabad Complex Rs. 132.65 crores (24.87%), Gurgaon Rs. 105.67 crores (19.82%), Bahadurgarh Rs. 29.12 crores (5.46%) and Kundli Rs. 23.71 crores (4.45%). Thus the share of Uttar Pradesh Sub-Region will be Rs. 242.12 crores (45.40%) and Haryana Sub-region Rs. 291.15 crores (54.60%).

The anticipated cost of water supply is likely to be Rs. 226.32 crores (42.44%), sewerage Rs. 163.75 crores (30.71%), storm water drainage Rs. 106.20 crores (19.91%) and solid waste disposal Rs. 37.00 crores (6.94%).

Town-wise break up of the estimates may be seen from the Tables 10.2 to 10.6.

Table 10.2 Estimated Cost of Water Supply, Storm Water Drainage and Solid W... Priority Towns and Delhi Metropolitan Area Towns–2001

Sl.No.	Name of Town/Urban Complex	Water Supply	Sewerage	Storm Water Drains		
	Priority Towns					
1.	Meerut	6943.20	5250	3900		
2.	Hapur	3735.30	3000	1800		
3.	Bulandshahr–Khurja Complex	6588.00	4575	3000		
4.	Palwal	1968.00	1455	900		
5.	Panipat	2860.50	2200	1500	500	
6.	Rohtak	3105.00	2150	1398	500	
7.	Rewari Complex	1996.20	1410	900	300	
8.	Alwar	2880.22	2500	1500	500	
	Sub-total	30076.20 (41.48%)	22540 (31.08%)	14898 (20.54%)	5000 (6.90%)	
	Delhi Metropolitan Area Towns					
1.	Ghaziabad including Loni	6591.00	4750	3300	1100	15 (2
2.	NOIDA	3520.50	2750	1650	550	8 (1
3.	Faridabad	5820.00	3925	2520	1000	132 (2
4.	Gurgaon	4467.00	3300	2100	700	105 (19
5.	Bahadurgarh	1212.00	900	600	200	2912 (5.46
6.	Kundli	1021.50	750	450	150	2371 (4.45
	Sub-total	22632.00 (42.44%)	16375 (30.71%)	10620 (19.91%)	3700 (6.94%)	53327.00 (100.00%
	Grand Total	52708.20 (41.88%)	38915 (30.92%)	25515 (20.28%)	8700 (6.92%)	125841.20 (100.00%

Table 10.3 Estimated Cost of Water Supply of Priority Towns and Delhi Metropolitan Area Towns–2001

SLNo.	Name of Town/Urban Complex	Population in 1981	Present total water supply in lakh litres per day	Population assigned for 2001 in lakhs	Additional requirement of water suppy by 2001 @ 227 litres per capita per day	Cost anticipated @ Rs. 3 per litre per day in lakh
	Priority Towns					
1.	Meerut	5.37	636.60	13.00	2314.40	6943.20
2.	Hapur	1.03	116.90	6.00	1245.10	3735.30
3.	Bulandshahr–Khurja Complex	1.70	74.00	10.00	2196.00	6588.00
4.	Palwal	0.47	25.00	3.00	656.00	1968.00
5.	Panipat	1.38	181.50	5.00	953.50	2860.50
6.	Rohtak	1.67	100.00	5.00	1035.00	3105.00
7.	Rewari Complex	0.52	15.60	3.00	665.40	1996.20
8.	Alwar	1.46	175.00	5.00	960.00	2880.00
	Sub-total	13.60	1324.60	50.00	10025.40	30076.20
	Delhi Metropolitan Area Towns					
1.	Ghaziabad including Loni	3.00	300.00	11.00	2197.00	6591.00
2.	NOIDA	0.75	75.00	5.50	1173.50	3520.50
3.	Faridabad	3.31	330.00	10.00	1940.00	5820.00
4.	Gurgaon	1.00	100.00	7.00	1489.00	4467.00
5.	Bahadurgarh	0.37	50.00	2.00	404.00	1212.00
6.	Kundli	0.25	–	1.50	340.50	1021.50
	Sub-total	8.68	885.00	37.00	7544.00	22632.00
	Grand Total	22.28	2179.60	87.00	17569.40	52708.20

Table 10.4 Estimated Cost for Sewerage System of Priority Towns and Delhi Metropolitan Area 2001.

Sl.No.	Name of Town/Urban Complex	Population in 1981 (in lakhs)	Population served by sewerage	Population assigned for 2001	Additional population to be covered (in lakhs)	Cost anticipated at Rs. 500 per capita
	Priority Towns					
1.	Meerut	5.37	2.50	13.00	10.50	5250
2.	Hapur	1.03	–	6.00	6.00	3000
3.	Bulandshahr–Khurja Complex	1.70	0.85	10.00	9.15	4575
4.	Palwal	0.47	0.09	3.00	2.91	1455
5.	Panipat	1.38	0.60	5.00	4.40	2200
6.	Rohtak	1.67	0.70	5.00	4.30	2150
7.	Rewari Complex	0.52	0.18	3.00	2.82	1410
8.	Alwar	1.46	–	5.00	5.00	2500
	Sub-total	13.60	4.92	50.00	45.08	22540
	Delhi Metropolitan Area Towns					
1.	Ghaziabad including Loni	3.00	1.5	11.00	19.50	4750
2.	NOIDA	0.75	N.A.	5.50	5.50	2750
3.	Faridabad	3.31	2.15	10.00	7.85	3925
4.	Gurgaon	1.00	0.40	7.00	6.60	3300
5.	Bahadurgarh	0.37	0.20	2.00	1.80	900
6.	Kundli	0.25	–	1.50	1.50	750
	Sub-total	8.68	4.25	37.00	32.75	16375
	Grand Total	22.28	9.17	87.00	77.83	38915

Table 10.5 Estimated Cost for Stormwater drains of Priority Towns and Delhi Metropolitan Area 2001.

Sl.No.	Name of Town/Urban Complex	Population in 1981 (in lakhs)	Population served by storm water drains in lakhs	Population assigned for 2001	Additional population to be covered (in lakhs)	Cost anticipated @ Rs. 300 per capita
	Priority Towns					
1.	Meerut	5.37	N.A.	13.00	13.00	3900
2.	Hapur	1.03	N.A.	6.00	6.00	1800
3.	Bulandshahr–Khurja Complex	1.70	N.A.	10.00	10.00	3000
4.	Palwal	0.47	–	3.00	3.00	900
5.	Panipat	1.38	–	5.00	5.00	1500
6.	Rohtak	1.67	0.34	5.00	4.66	1398
7.	Rewari Complex	0.52	–	3.00	3.00	900
8.	Alwar	1.46	–	5.00	5.00	1500
	Sub-total	13.60	0.34	50.00	49.66	14898
	Delhi Metropolitan Area Towns					
1.	Ghaziabad including Loni	3.00	N.A.	11.00	11.00	3300
2.	NOIDA	0.75	N.A.	5.50	5.50	1650
3.	Faridabad	3.31	1.60	10.00	8.40	2520
4.	Gurgaon	1.00	–	7.00	7.00	2100
5.	Bahadurgarh	0.37	–	2.00	2.00	600
6.	Kundli	0.25	–	1.50	1.50	450
	Sub-total	8.68	1.60	37.00	35.40	10620
	Grand Total	22.28	1.94	87.00	85.06	25518

Say Rs. 255 crores.

Table 10.6 Estimated Cost for Solid Waste Disposal in Priority Towns and Delhi Metropolitan Area 2001.

S.No.	Name of Town/Urban Complex	Population assigned –2001 in lakhs	Total @ Rs. 100 per capita Rs. in lakhs
	Priority Towns		
.	Meerut	13.00	1300
:.	Hapur	6.00	600
·.	Bulandshahr–Khurja Complex	10.00	1000
l.	Palwal	3.00	300
i.	Panipat	5.00	500
i.	Rohtak	5.00	500
'.	Rewari Complex	3.00	300
3.	Alwar	5.00	500
	Sub-total	50.00	5000
	Delhi Metropolitan Area Towns		
1.	Ghaziabad including Loni	11.00	1100
2.	NOIDA	5.50	550
3.	Faridabad Complex	10.00	1000
4.	Gurgaon	7.00	700
5.	Bahadurgarh	2.00	200
6.	Kundli	1.50	150
	Sub-total	37.00	3700
	Grand Total	Rs. 87 lakhs	Rs. 87 crores

10.7 Summary

The total amount (tentative) required for implementing the proposals except for power schemes works out to about Rs. 3040 crores. The sector-wise break-up is summarised below and in Fig. 28.

Table 10.7 Sector-wise Cost Estimates

Sl. No.	Sector	Tentative cost estimates (Rs. in crores)
1.	Land acquisition and development	1010.70*
2.	Roads	292.12
3.	Railways	242.45
4.	Telecommunications	138.00
5.	Development of Economic Activities	100.00
6.	Physical Infrastructure (excluding Power)	1258.41
	Total	3041.68

* Required as seed capital.

Note: Power Schemes are not included as the cost estimates for thesame could not be obtained by the Board in time.

Fig-28. Financial Implications of the Interim Development Plan-2001

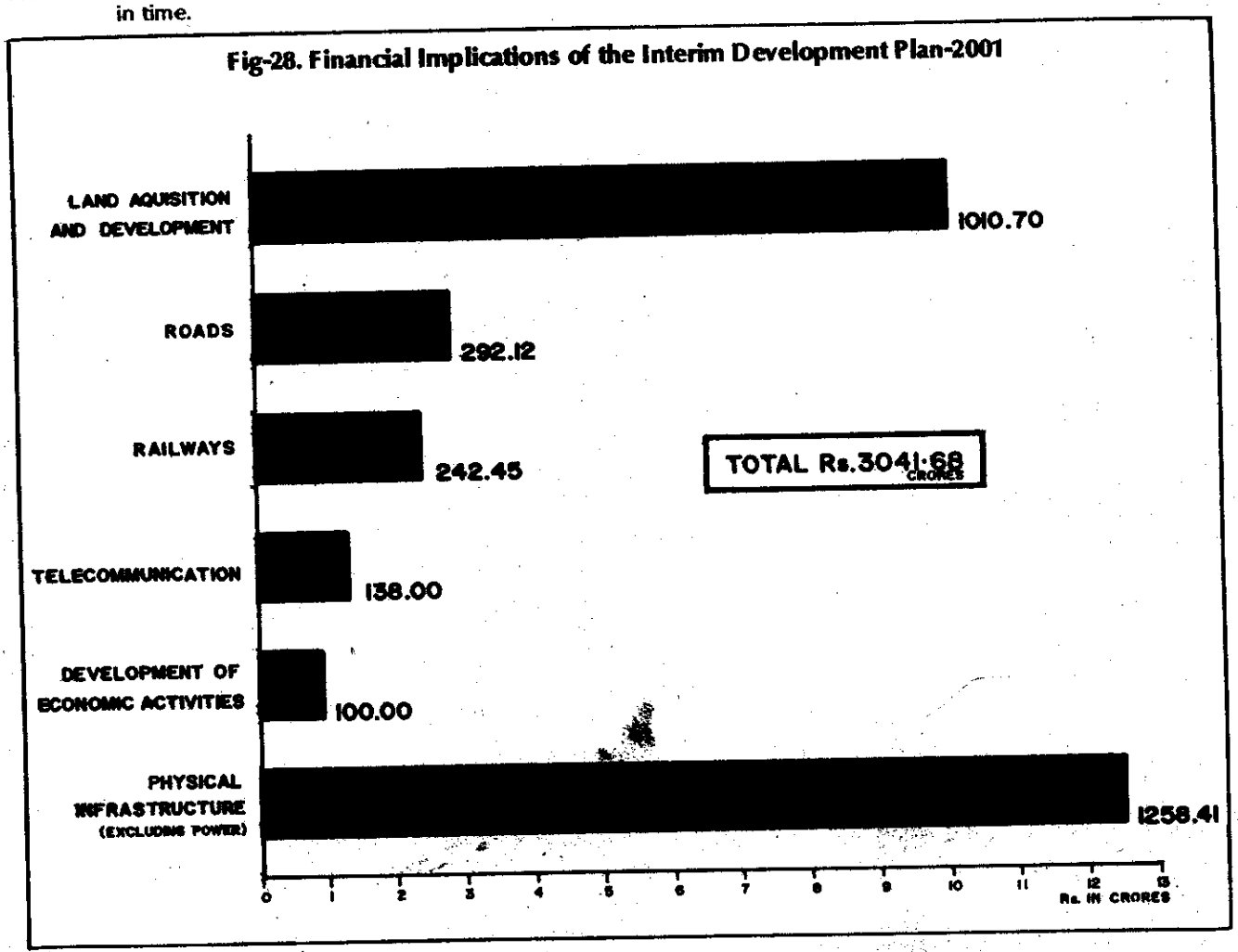
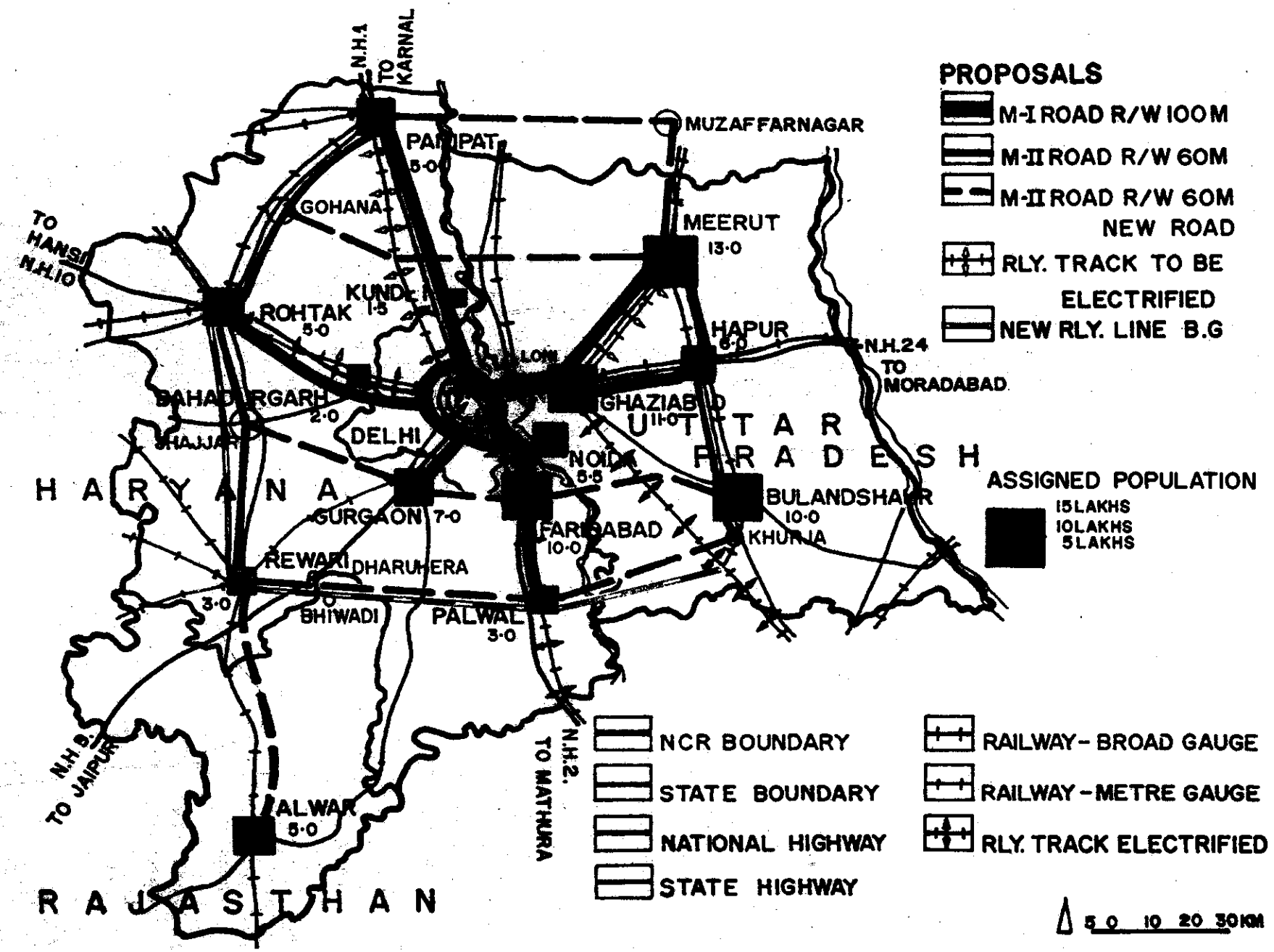


Fig-29. Development Proposals-2001



APPENDIX

A. PLANNING COMMITTEE

1. Shri M. Shankar
   Member Secretary
   NCR Planning Board — Chairman

2. Shri R.L. Pardeep
   Joint Secretary in the Ministry of Urban Development dealing with the work relating to NCR — Member

3. Shri M.C. Gupta
   Shri J.K. Duggar
   Shri R.S. Mann (Current)
   Secretary-in-charge of NCR work in the State of Haryana — Member

4. Shri R. Ramakrishna
   Shri P.B. Mathur (Current)
   Secretary-in-charge of NCR work in the State of Rajasthan — Member

5. Shri Kamal Pande
   Shri A.P. Singh (Current)
   Secretary-in-charge of NCR work in the State of Uttar Pradesh — Member

6. Shri S.V. Vajpai
   Shri P.S. Bhatnagar
   Shri Ganga Dass (Current)
   Secretary-in-charge of NCR work in the Delhi Union Territory — Member

7. Shri Prem Kumar
   Vice Chairman
   Delhi Development Authority — Member

8. Shri E.F.N. Ribeiro
   Chief Planner
   Town & Country Planning Organisation — Member

9. Shri G. Madhavan
   Director, Town Planning
   Department Government of Haryana — Member

10. Shri H.S. Mathur,
    Chief Town Planner
    Government of Rajasthan — Member

11. Shri N.S. Johri,
    Chief Town Planner
    Government of Uttar Pradesh — Member

12. Shri V.A. Valiaparampil
    Joint Adviser Representative
    Planning Commission
    Government of India — Member

13. Shri L.R. Kadiyali
    Shri D.P. Gupta (Current)
    Chief Engineer (Planning)
    Representative, Ministry of Shipping and Transport
    Government of India — Member

14. Shri Y.P. Gambhir
    Director (Power)
    Representative, Ministry of Energy, Government of India — Member

15. Shri R.M. Raina,
    Director (Planning)
    Representative, Ministry of Railways, Government of India — Member

16. Shri B.M. Khanna
    Shri A.S. Wakhle (Current)
    Deputy Director General (T.P.)
    Representative, Ministry of Communications,
    Government of India — Member

17. Shri S.K. Sharma
    Chairman and Managing Director
    Housing & Urban Development Corporation — Member

18. Shri B.N. Singh
    Chief Regional Planner
    NCR Planning Board — Member (Convenor)

B. STUDY GROUPS

I. Study Group on Demographic Features of the Region and the Settlement Pattern

1. Shri K.S. Natarajan
   Assistant Registrar General of Census
   Government of India
   New Delhi

2. Shri J.C. Chopra
   Chief Town Planner
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3. Shri H.S. Mathur
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4. Shri N.S. Johri
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   Lucknow

5. Shri J.C. Gambhir
   Director (PPW)
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   New Delhi

6. Shri P. Jayapal
   Assistant Town Planner
   NCR Planning Board

7. Shri J.N. Burman
   Assistant Planner
   NCR Planning Board

8. Shri T.K. Chatterjee
   Regional Planner
   NCR Planning Board — Convenor

II. Study Group on Regional Transport and Communication

1. Shri K.R. Punia
   Transport Commissioner
   Government of Haryana
   Chandigarh

2. Shri G.J. Misra
   Transport Comm
   Government of
   Jaipur

3. Shri Pankaj Kum
   Transport Comm
   Government of
   Lucknow

4. Shri P.V. Venkata
   Managing Direct
   Delhi Transport C
   New Delhi

5. Shri R.M. Raina
   Director, Railway B
   New Delhi

6. Shri B.M. Khanna
   Deputy Director Gen
   Ministry of Telecommu
   Government of India
   New Delhi

7. Shri K.M. Sharan
   Chief Engineer (Constru
   Northern Railway
   New Delhi

8. Prof. N. Ranganathan
   School of Planning and A
   New Delhi

9. Lala Durga Dass
   PHD Chamber of Commerce
   New Delhi

10. Shri L.R. Kadiyali
    Chief Engineer (Planning)
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11. Shri S.P. Grover
    Chief Engineer (Roads)
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    Chandigarh

12. Shri M.C. Sharma
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Government of Rajasthan
Rajasthan

13. Shri Man Mohan Seth
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3. Shri M.B. Jain
Chief Engineer (PH)
Public Health Department
Government of Rajasthan
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4. Shri D.L. Mathur
Additional Chief Engineer (Jaipur Region)
Public Health Engineering Department
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5. Shri S.N. Mathur
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Public Health Department
Government of Uttar Pradesh
Lucknow

6. Shri S. Prakash
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Water Supply and Sewerage
Delhi Administration
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7. Shri Man Mohan Singh
Research Assistant
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IV. Study Group of Power

1. Shri S.K. Aggarwal
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Central Electricity Authority)
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2. Shri P.N. Vishwanathan
Chief Engineer (Planning II)
Central Electricity Authority
New Delhi

3. Shri J.C. Juneja
Superintending Engineer (Planning)
Haryana State Electricity Board
Panchkula

4. Shri H.J. Raisinghani
Chief Engineer
(Project Planning & Monitoring)
Rajasthan Electricity Board
Jaipur

5. Shri P.D. Sharma
Chief Engineer (Planning)
Delhi Electricity
Supply Undertaking
New Delhi

6. Shri Bhopla Singh
Member (Distribution)
Uttar Pradesh State
Electricity Board
Lucknow

7. Shri J.C. Jain
Chief Zonal Engineer
Uttar Pradesh State
Electricity Board
Meerut

8. Shri J.P. Kapoor
PHD CCI
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9. Shri J. Nagarajan
Research Officer
NCR Planning Board
New Delhi — Convenor

V. Study Group on Industries

1. Shri Pradeep Kumar
Director of Industries
Government of Haryana
Chandigarh

2. Shri M.L. Goel
Director of Industries
Government of Rajasthan
Jaipur

3. Shri Ravinder Gupta
Director of Industries
Government of Uttar Pradesh
Kanpur

4. Shri P.K.S. Iyer
Director (Industrial Policy)
Ministry of Industrial Development
New Delhi

5. Shri S. Neelakantan
Director (Admn.)
Office of Development Commissioner
Small Scale Industries
Ministry of Industry
New Delhi

6. Shri K.P. Singh
Vice President
PHD CCI
New Delhi

7. Shri Sushil Ansal
Shairman
NCR Committee of PHD CCI
New Delhi

8. Shri B.P. Mishra
Director of Industries
Delhi Administration
Delhi

9. Shri V.K. Thakore
Senior Research Officer
NCR Planning Board
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