

REGIONAL PLAN-2021 NATIONAL CAPITAL REGION



NATIONAL CAPITAL REGION PLANNING BOARD
MINISTRY OF URBAN DEVELOPMENT, GOVERNMENT OF INDIA



INTRODUCTION

1.1 PREAMBLE

The unprecedented growth of metropolitan cities in the country has become a source of serious concern to Government, on the one hand, and metro-city corporators, planners, demographers and social scientists, on the other. The Census 2001 reveals that the number of million-plus cities has almost tripled over the last three decades, jumping from a mere 12 in 1981 to 23 in 1991 and 35 in 2001. Interestingly, the aggregate population of these metro cities accounts for more than a third (37.81%) of the country's total urban population, which is spread over more than 5,000 towns. It, therefore, goes without saying that these 35 metro (or million-plus) cities should be the focus of a sustained, country-wide effort to regulate and contain runaway urban growth by channelising the flow and direction of economic growth (on which the urban phenomenon feeds) along more balanced and spatially-oriented paths. This is essentially what the National Capital Region (NCR) Planning Board is attempting to do with respect to the National Capital City.

The vast hinterland of the NCR, which lies mostly outside the Delhi Metropolitan Area (DMA) [now Central National Capital Region (CNCR)], continues to experience a very slow rate of economic development even while the core Sub-region of NCT-Delhi is witnessing a phenomenal surge of physical and economic growth. A recent survey of the four mega-cities (Mumbai, Kolkata, Chennai and NCT-Delhi) and four other metropolitan cities (Pune, Bangalore, Hyderabad and Ahmedabad) has revealed that Delhi tops in job generation. Delhi accounts for one fourth of the total jobs created in these eight largest cities of India. Not surprisingly, this has led to the runaway growth of the national Capital on the one hand and rapidly deteriorating physical environment on the other. The economic potential of Delhi has hardly flown down to the other regional urban centres specially those located beyond the DMA (now CNCR). These towns continue to remain comparatively undeveloped with poor living environment. Under-development of the areas outside Delhi, or to be more specific outside CNCR, is primarily a problem of relationship rather than a problem of scarcity. To give an example, the total travel time from Delhi to the farthest point in the region is so short that no big centres of transportation and trading activity have developed in the outer area of the NCR. Thus, the entire region outside CNCR is still registering a relatively slow growth rate leading to a lopsided development of the region characterised by the 'Metropolis-Satellite' syndrome, where part of the economic surplus of the periphery is extracted by the core without any plough back and whatever development takes place in the periphery mostly reflects the expansion needs of the core.

1.2 BACKGROUND

1.2.1 Unprecedented Growth of NCT-Delhi

The National Capital Territory of Delhi, which had recorded an extraordinary growth during 1941-1951 practically doubling its population with lakhs of immigrants thronging to Delhi to take refuge in the

aftermath of the partition of the country, continued to experience average decadal growth rate of above 50% since 1951 except in the last decade (1991-2001) when it was 47.02%. This is higher than that experienced by any of the four largest mega cities in India. The continuance of this trend made Delhi to reach the population level of 138 lakhs in 2001.

1.2.2 Interim General Plan for Greater Delhi, 1956

In view of the unprecedented growth of population and haphazard development of urban areas following the Partition and independence, the Government of India felt a need for planned development of Delhi. The first such exercise was done by the Town Planning Organisation (TPO), which prepared an Interim General Plan (IGP) in 1956 for Greater Delhi. The Plan stressed the necessity of planning Delhi in a regional context. The Plan suggested that *'serious consideration should be given for a planned decentralisation to outer areas and even outside the Delhi region'*.

1.2.3 Master Plan for Delhi, 1962

The Master Plan for Delhi (MPD-1962) for the perspective year of 1981 also recognised the need of planning of Delhi in the regional context. It defined Delhi Metropolitan Area of 800 square miles comprising the Union Territory of Delhi and the six Ring Towns viz., Loni & Ghaziabad in U.P., Faridabad, Ballabgarh, Bahadurgarh & Gurgaon in Punjab (now Haryana) and Narela in the Union Territory of Delhi. The underlying idea was *'to achieve a rational growth of Delhi which has been expanding in a most haphazard way, it is necessary to plan this whole area as a composite unit and have an integrated and balanced overall programme of development. The Ring Towns must be developed not only to deflect some of the population that would otherwise come into Delhi and jeopardize the planned growth of Delhi but also to help these towns to grow in a planned way'* to accommodate four lakhs population deflected from Delhi in order to keep the population of urban Delhi to a manageable limit of 46 lakhs and about 50 lakhs for the Union Territory of Delhi. It was proposed to ensure the strengthening of the economic base of these towns by planning industrial development and locating government offices in these towns. The total requirement of land for this purpose was estimated at 4,660 acres for projected industrial employment of 1.14 lakhs and 0.50 lakh employment in government offices.

The Plan also defined the National Capital Region *'comprising the Union Territory of Delhi and the 8 adjoining Tehsils and 3 additional Tehsils of Meerut, Hapur and Bulandshahr'*. The Plan also recommended the setting up of a Statutory National Capital Planning Board and development of the region in accordance with a Regional Plan.

1.2.4 Constitution of High Power Board

Taking cognizance of the recommendation following the publication of the Master Plan for Delhi, the Government of India set up a High Power Board under the chairmanship of the Union Home Minister, with the Chief Ministers of Punjab and Uttar Pradesh, representative of the Planning Commission, the Commissioner and the Mayor of Delhi as its members.

Subsequently, the Board was reconstituted under the chairmanship of the Union Minister of Works and Housing (now Ministry of Urban Development).

This High Power Board was entrusted with the task of coordinating the development of urban and rural areas in the NCR within the framework of a comprehensive Regional Plan to be formulated by the Board in collaboration with the concerned State Governments. But the Board could not meet for a long time. It met for the first time in 1965 and then in 1967, the Board set up a Planning Advisory Committee with representatives of the Planning Commission and the Town Planners of the Central and respective State Governments under the chairmanship of Advisor, Planning Commission. The Committee delineated the

National Capital Region leading to the formulation of an interim report on the planning of NCR and the task of preparing a comprehensive Regional Plan was entrusted to the Town and Country Planning Organisation (TCPO).

1.2.5 Regional Plan-1981 for NCR

The Regional Plan-1981 of NCR prepared by TCPO in 1973 and approved by the High Power Board under the chairmanship of the Union Minister of Works, Housing and Supply, reiterated the need to regulate the growth of Delhi and decentralisation of economic activities including shifting of government offices and public sector undertakings, wholesale trade and industry.

1.2.6 NCRPB Act, 1985

Time and again the need was felt to plan Delhi in the regional context under a suitable legislation which would control and regulate development in the region and finally Parliament enacted the National Capital Region Planning Board Act in 1985 with the concurrence of the constituent States "*to provide for the constitution of a Planning Board for the preparation of a plan for the development of the National Capital Region and for coordinating and monitoring the implementation of such plan and for evolving harmonised policies for the control of land uses and development of infrastructure in the National Capital Region so as to avoid any haphazard development of that Region and for matters connected therewith or incidental thereto*" (refer Annexure 1/I for the composition of the NCR Planning Board).

1.2.7 Important Provisions of the NCRPB Act, 1985

Section 10 of the Chapter IV of the NCRPB Act, 1985 makes the following provisions for the preparation of the Regional Plan:

10 (1) The Regional Plan shall be a written statement and shall be accompanied by such maps, diagrams, illustrations and descriptive matters as the Board may deem appropriate for the purpose of explaining or illustrating the proposals contained in the Regional Plan and every such map, diagram, illustration and descriptive matter shall be deemed to be a part of the Regional Plan.

10 (2) The Regional Plan shall indicate the manner in which the land in the National Capital Region shall be used, whether by carrying out development thereon or by conservation or otherwise, and such other matters as are likely to have any important influence on the development of the National Capital Region and every such Plan shall include the following elements needed to promote growth and balanced development of the National Capital Region, namely:-

- (a) the policy in relation to land use and the allocation of land for different uses;*
- (b) the proposals for major urban settlement pattern;*
- (c) the proposals for providing suitable economic base for future growth;*
- (d) the proposals regarding transport and communications including railways and arterial roads serving the National Capital Region;*
- (e) the proposals for the supply of drinking water and for drainage;*
- (f) indication of the areas which require immediate development as "priority areas"; and*

- (g) *such other matters as may be included by the Board with the concurrence of the participating States and the Union Territory for the proper planning of the growth and balanced development of the National Capital Region.*

Section 15 of the Act, 1985 gives directions regarding the review and how the revision is to be carried out which is as follows:

- 15(1) *After every five years from the date of coming into operation of the finally prepared Regional Plan, the Board shall review such Regional Plan in its entirety and may, after such review, substitute it by a fresh Regional Plan or may make such modifications or alterations therein as may be found by it to be necessary.*
- 15(2) *Where it is proposed to substitute a fresh Regional Plan in place of the Regional Plan which was previously finally prepared or where it is proposed to make any modifications or alterations in the finally prepared Regional Plan, such fresh Plan or, as the case may be, modifications or alterations, shall be published and dealt with in the same manner as if it were the Regional Plan referred to in sections 12 and 13 or as if they were the modifications or alterations in the Regional Plan made under section 14.*

For the preparation of the fresh Regional Plan under Section 15(2) of the Act, 1985 the following procedure has been laid down in Section 12 of the Act, 1985:

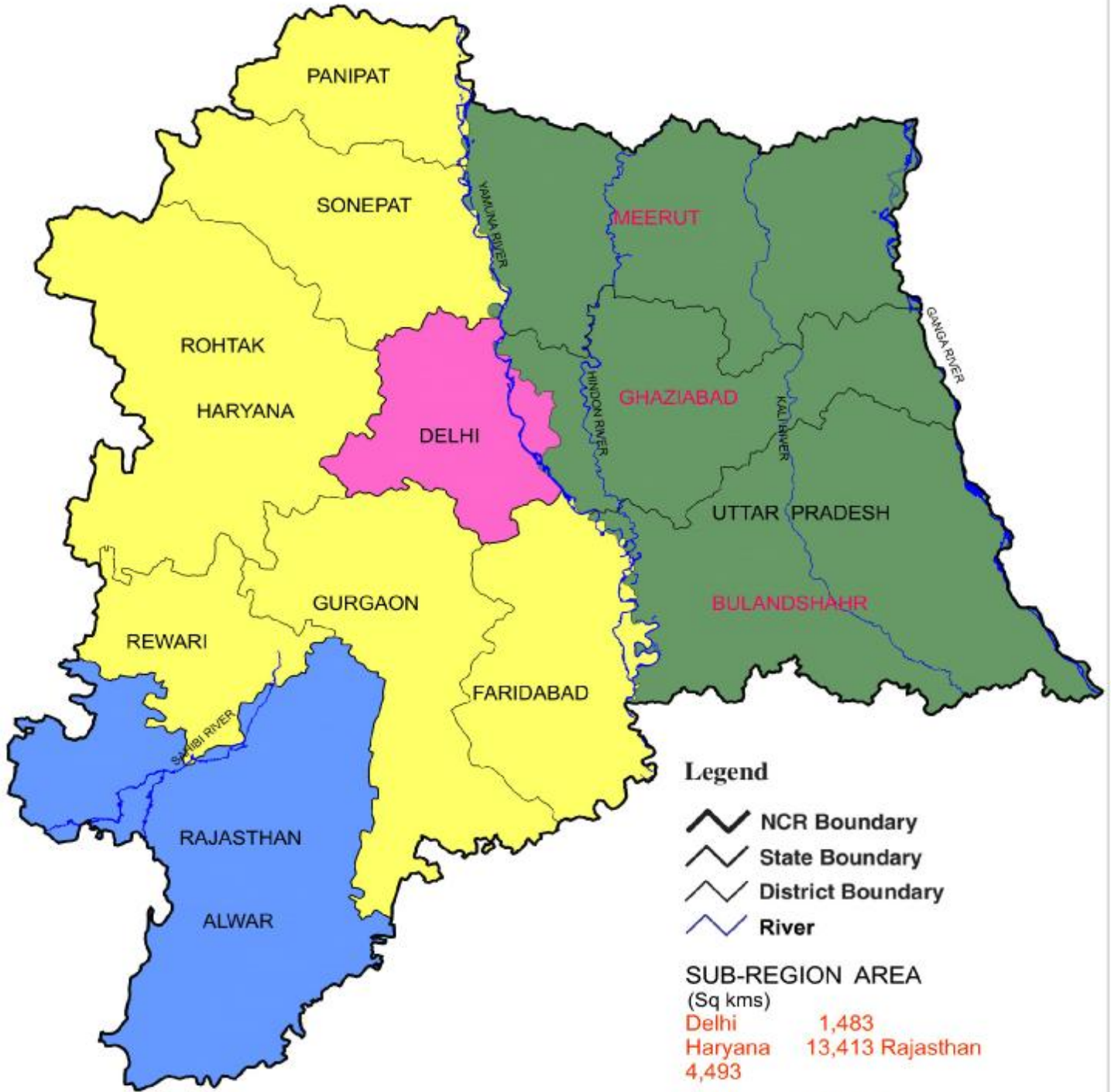
- 12(1) *Before preparing any Regional Plan finally, the Board shall prepare with the assistance of the Committee a Regional Plan in draft and publish it by making a copy thereof available for inspection and publishing a notice in such form and in such manner as may be prescribed inviting objections and suggestions from any person with respect to the draft Regional Plan before such date as may be specified in the notice.*
- 12(2) *The Board shall also give reasonable opportunities to every local authority within whose local limits any land touched by the Regional Plan is situated, to make any representation with respect to the draft Regional Plan.*
- 12(3) *After considering all objections, suggestions and representations that may have been received by the Board, the Board shall finally prepare the Regional Plan.*

1.3 CONSTITUENT AREAS

As defined in Schedule {Section 2 (f)} to the Act, 1985 and the subsequent notification dated 14.03.1986, the National Capital Region covers an area of 30,242 sq kms (Map 1.1 National Capital Region Regional Plan-2001: Constituent Areas). The region includes the Union Territory of Delhi and parts of the States of Haryana, Rajasthan and Uttar Pradesh. The Administrative units are as follows:

- a) Union Territory of Delhi.
- b) Haryana Sub-region comprising Faridabad, Gurgaon, Rohtak and Sonapat districts; Rewari tehsil of Mahendragarh district and Panipat tehsil of Karnal district.
- c) Rajasthan Sub-region comprising six tehsils of Alwar district, namely, Alwar, Ramgarh, Behror, Mandawar, Kishangarh and Tijara.
- d) Uttar Pradesh Sub-region comprising three districts namely, Meerut, Ghaziabad and Bulandshahr.

NATIONAL CAPITAL REGION
REGIONAL PLAN-2001: CONSTITUENT AREAS



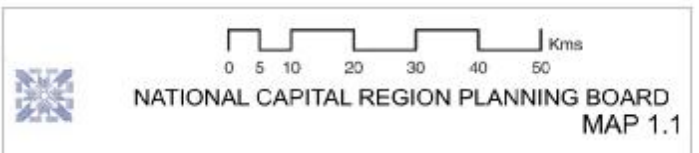
Legend

- NCR Boundary
- State Boundary
- District Boundary
- River

SUB-REGION AREA

(Sq kms)

Delhi	1,483
Haryana	13,413
Rajasthan	4,493
U.P.	10,853
Total	30,242



The Board in its 26th meeting held on 16.01.2004 approved the inclusion of additional areas comprising the remaining tehsils of Alwar district to NCR to the extent that its boundary coincided with the district boundary of Alwar in Rajasthan Sub-region, which was notified on 23.08.2004. Thus, the total area of NCR increased to 33,578 sq kms and the area of Rajasthan Sub-region increased from 4,493 sq kms to 7,829 sq kms.

1.3.1 Regional Plan-2001

The Regional Plan-2001, approved by the Board in November 1988, visualised the important goal of "*a balanced and harmoniously developed region, leading to dispersal of economic activities and immigrants to Delhi, thereby leading to a manageable Delhi*". The Plan proposed "*a policy of strict control on creation of employment opportunities within the Union Territory of Delhi, moderate control in the Delhi Metropolitan Area and, encouragement with incentives, in the areas outside Delhi Metropolitan Area within the NCR*".

Regional Plan-2001 provides a unique model for sustainable urban development within a predominantly rural setting and seeks to achieve its objectives through an inter-related policy framework relating to population (re-distribution), settlement systems, regional land use patterns, environmental factors, economic activities and infrastructural facilities.

1.3.2 Legal Affirmation of the Plan

Since the date of its enforcement, the Regional Plan has been taken up for implementation by the respective participating States namely, NCT-Delhi, Haryana, Rajasthan and Uttar Pradesh. It was during the course of its implementation that the Hon'ble Supreme Court and also the Allahabad High Court, while going through the relevant provisions under the NCRPB Act, 1985, considered the Regional Plan a major instrument of regional development.

The Hon'ble Supreme Court in its judgment dated 31.03.1994 observed:

"...the overriding effect of the Act by virtue of Section 27 and total prohibition of any activity of development in violation of the finally published Regional Plan provided in Section 29 of the Act is sufficient to indicate that any claim inconsistent with the finally published Regional Plan in the area cannot be sustained on any ground."

The Allahabad High Court in its judgment dated 01.10.1996 further elaborated:

"one stipulation is inescapable that unless the National Capital Region Planning Board gives the green signal nothing can go ahead. The necessary implication of this is also that at every stage in reference to the plans, aforesaid, each Constituent State, a part of the National Capital Region plan, has to keep a close consultation with the federal agency which is the Board."

1.3.3 Sub-regional Plans

Under the provisions of Section 17(1) of the Act, 1985 each participating State is required to prepare a Sub-regional Plan for the Sub-region within the State. Section 19 of the Act, 1985 provides the directions for the submission of Sub-regional Plan to the Board for the approval and Section 20 provides for the implementation of Sub-regional Plans by each participating States.

Regional Plan-2001 was prepared by the Board and notified in January 1989. The constituent States were expected to submit their respective Sub-Regional Plans for approval of the Board.

Sub-regional Plans of Uttar Pradesh and Rajasthan Sub-regions were prepared by the respective State Governments and were approved by the Board in June 1992 and April 1994 respectively.

1.3.4 Functional Plans

Section 16 of the National Capital Region Planning Board Act, 1985 provides for the preparation of Functional Plan '*as a plan prepared to elaborate one or more elements of the Regional Plan*', by the Board with the assistance of the Planning Committee (refer Annexure 1/I for the composition of the Planning Committee), for the proper guidance of the participating states and the Union Territory. The Board accordingly prepared and approved Functional Plans of: (i) Transport (in November 1995), (ii) Power (in August 1996), (iii) Telecommunications (in March 1997) and (iv) Industry (in June 1998).

1.3.5 Review of Regional Plan-2001

The NCRPB Act, 1985, stipulates that the Regional Plan shall be reviewed periodically. In compliance to this mandate, NCRPB constituted a Steering Committee to conduct the review exercise and its recommendations were approved by the Board in the year 1999.

Some of the major recommendations of the review report are as follows:

- The practice of piecemeal and ad hoc decisions for development should be stopped.
- Necessary modifications in the plan-enabling legislation should be made to mandate systematic programming and fixation of priorities without which no long-term plan can be implemented in the envisaged time frame.
- Location of new offices, allied institutions and offices of the public sector undertakings (PSUs) within NCT-Delhi should be completely stopped.
- Offices and institutes, which have already been identified, should be shifted out of the National Capital Territory of Delhi in the metropolitan area, preferably in the metro region.
- Programmes need to be prepared and a time-bound schedule made for the relocation of certain identified wholesale trades in a programmed manner in the designated towns and cities of the NCR.
- In the interest of the future and survival of Delhi, it is imperative that no massive investment, specially in short time, should be made in Delhi that is bound to further enhance its magnetism.
- Investments are nonetheless required to fill the increasing gaps in urban infrastructure and services including water supply, electricity, sanitation, flood control and drainage.
- Operationalisation and implementation of the principle of Common Economic Zone (CEZ)
- Amendments and modifications required to be made in the plan-enabling legislation, viz. DDA Act, 1957 and NCRPB Act, 1985 to make it more responsive and in tune with the changing realities.
- Future of Delhi lies in the sequential development of its metropolitan region and a lot remains to be accomplished in the coming decades. The steps have to be taken in right earnest with implicit faith in the future of Delhi, otherwise the nation's Capital cannot survive.

1.3.6 Preparation of Regional Plan-2021

In pursuance of the decision of the 25th meeting of the Board held on 12.07.2000, a High Level Group was constituted vide O.M. No. K-14011/2001-DDIB dated 18.01.2001 under the chairmanship of the Union Minister for Urban Development and Poverty Alleviation for the preparation of the Regional Plan with the perspective year 2021. Subsequently, eight Study Groups were constituted by the High Level Group with experts, non-officials and senior officers from various government agencies as members (refer Annexure 1/II). The Study Groups were related to following aspects:

- a) NCR Policy zones, demographic profile and settlement pattern
- b) Regional land use and rural development
- c) Physical infrastructure including transport and communications
- d) Utility and service infrastructure including power, water, sewerage, solid waste, drainage, irrigation etc.
- e) Social infrastructure including education, health, shelter, recreation, law and order etc.
- f) Environment including tourism, heritage, pollution, disaster management etc.
- g) Institutional Framework.
- h) Economic and Fiscal Policy group including resource mobilization, funding etc.

These Study Groups submitted their reports, which were discussed and deliberated in a two-day seminar held in January 2002 in which members of the Planning Committee, High Level Group, representatives of the development authorities in the region, NGOs etc. attended. The Chairmen of the Study Groups presented their reports.

On the basis of the recommendations of the Study Groups and the discussions held in the seminar, Working Group (refer Annexure 1/III) was constituted to strategise the Regional Plan and to introduce phasing and action plans into the process of the Regional Plan-2021 for better implementation. The Working Group's recommendations were discussed in the Planning Committee meeting held on 29th September 2003. Based on the suggestions and decisions taken in the said meeting, the draft Regional Plan-2021 was prepared.

The draft Regional Plan-2021 was considered in the 26th meeting of the Board held on 16.01.2004 for publishing the same in order to invite objections/suggestions under Section 12 of the NCRPB Act, 1985. The Board directed to seek suggestions/comments of the constituent States. Accordingly, suggestions/comments from them were invited. The suggestions/comments received were examined and placed before the Board in its 27th meeting held on 28.10.2004. The Board approved the draft Regional Plan-2021 for inviting objections/suggestions under Section 12 of the NCRPB Act, 1985. Consequently, the draft Regional Plan-2021 was published on 27.12.2004 inviting objections/suggestions on various aspects of the Plan from the public, Central and State Governments and the local bodies (refer Annexure 1/IV). After thorough scrutiny and consideration of the objections/suggestions, the Planning Committee, in its 53rd meeting held on 05.05.2005, put forward its recommendations to the Board. The Board, in its 28th meeting held on 09.07.2005, discussed the recommendations and approved the incorporation of the recommendations in the Plan. It also approved the Regional Plan-2021 of NCR for publication and notification under Section 13 of the NCRPB Act, 1985 and Rule 27 of the NCRPB Rules, 1985 (refer Annexure 1/V).



THE REGION

2.1 CONSTITUENT AREAS OF NCR

The Constituent Areas of the National Capital Region are as under:

- a) National Capital Territory of Delhi (1,483 sq kms). This accounts for 4.41% of the total area of NCR.
- b) Haryana Sub-region comprising of Faridabad, Gurgaon, Rohtak, Sonapat, Rewari, Jhajjar, Mewat and Panipat districts. This accounts for 30.33% (13,413 sq kms) of the area of the State and 39.95% of the area of NCR.
- c) Rajasthan Sub-region comprises of Alwar district. The area is 2.29% (7,829 sq kms) of the total area of the State and 23.32% of the area of NCR.
- d) Uttar Pradesh Sub-region comprising of five districts namely, Meerut, Ghaziabad, Gautam Buddha Nagar, Bulandshahr and Baghpat. This accounts for 4.50% (10,853 sq kms) of the area of the State and 32.32% of the area of NCR.

Thus, the total area of NCR is 33,578 sq kms as indicated in the Map 2.1 National Capital Region Regional Plan-2021: Constituent Areas.

2.2 PHYSICAL SETTING

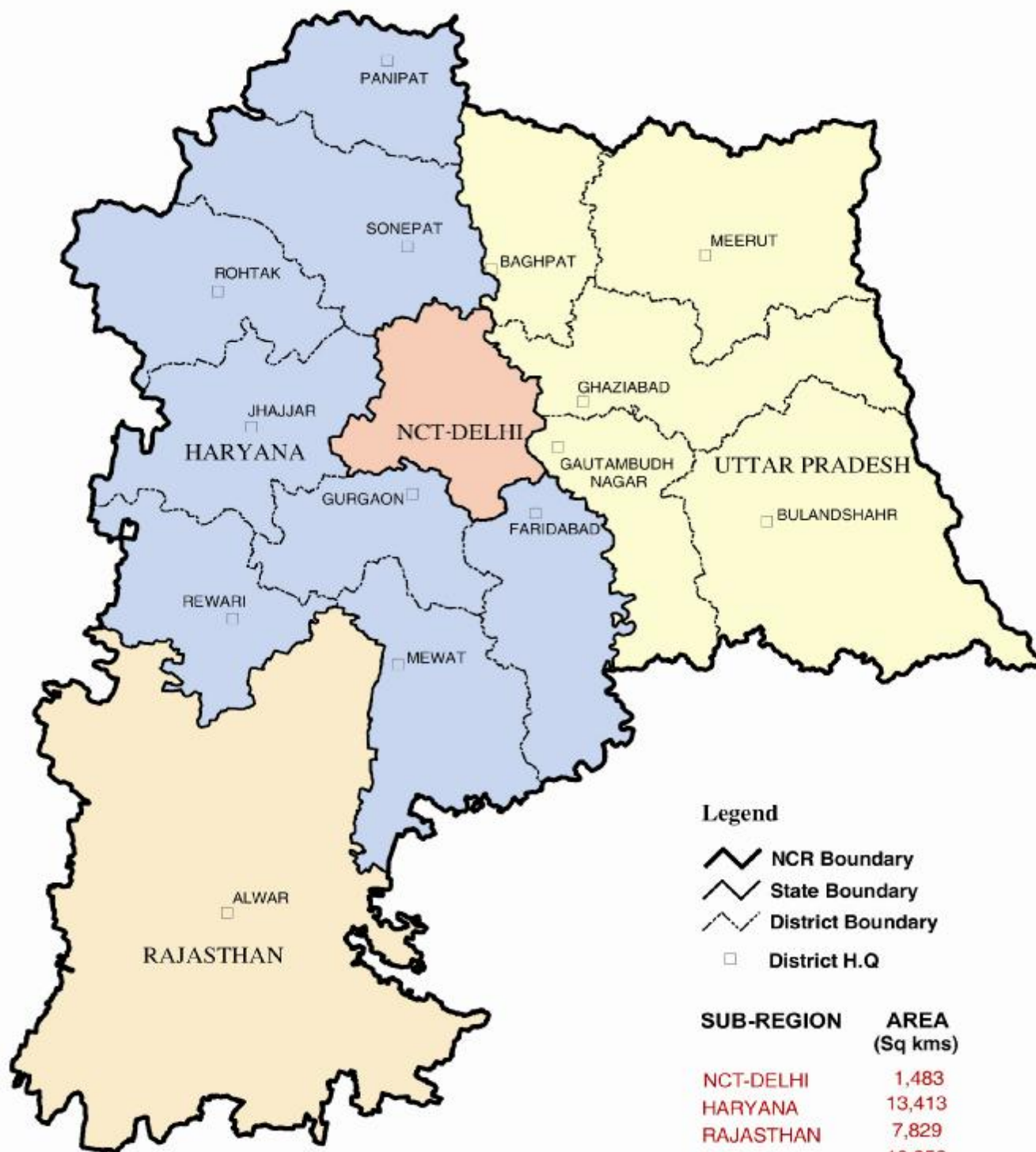
The National Capital Region lies between 27° 03' and 29° 29' North latitude and 76° 07' and 78° 29' East longitude. The region includes the National Capital Territory of Delhi (earlier Union Territory of Delhi) and parts of the States of Haryana, Rajasthan and Uttar Pradesh.

The physiography of the region is characterised by the presence of the Ganga skirting it as its eastern boundary, the Yamuna traversing north-south forming the boundary between Uttar Pradesh and Haryana, and the sand dunes and barren low hills of the Aravalli chain and its outcrops in the west, flat topped prominent and precipitous hills of the Aravalli range enclosing fertile valleys and high table lands in the south-west, and the rolling plains dominated by rain-fed torrents in the south. The rest of the region is plain with a gentle slope of north-east to south and south-west (Map 2.2 National Capital Region: Physiography and Slope).

2.3 GEOLOGY

The rock type exposed in the area belongs to Delhi Super-group of Lower Proterozoic age and consists of Quartzite of the Alwar Group, Phyllite and Slate of the Ajabgarh Group. The Quartzites are massive

NATIONAL CAPITAL REGION REGIONAL PLAN-2021:CONSTITUENT AREAS



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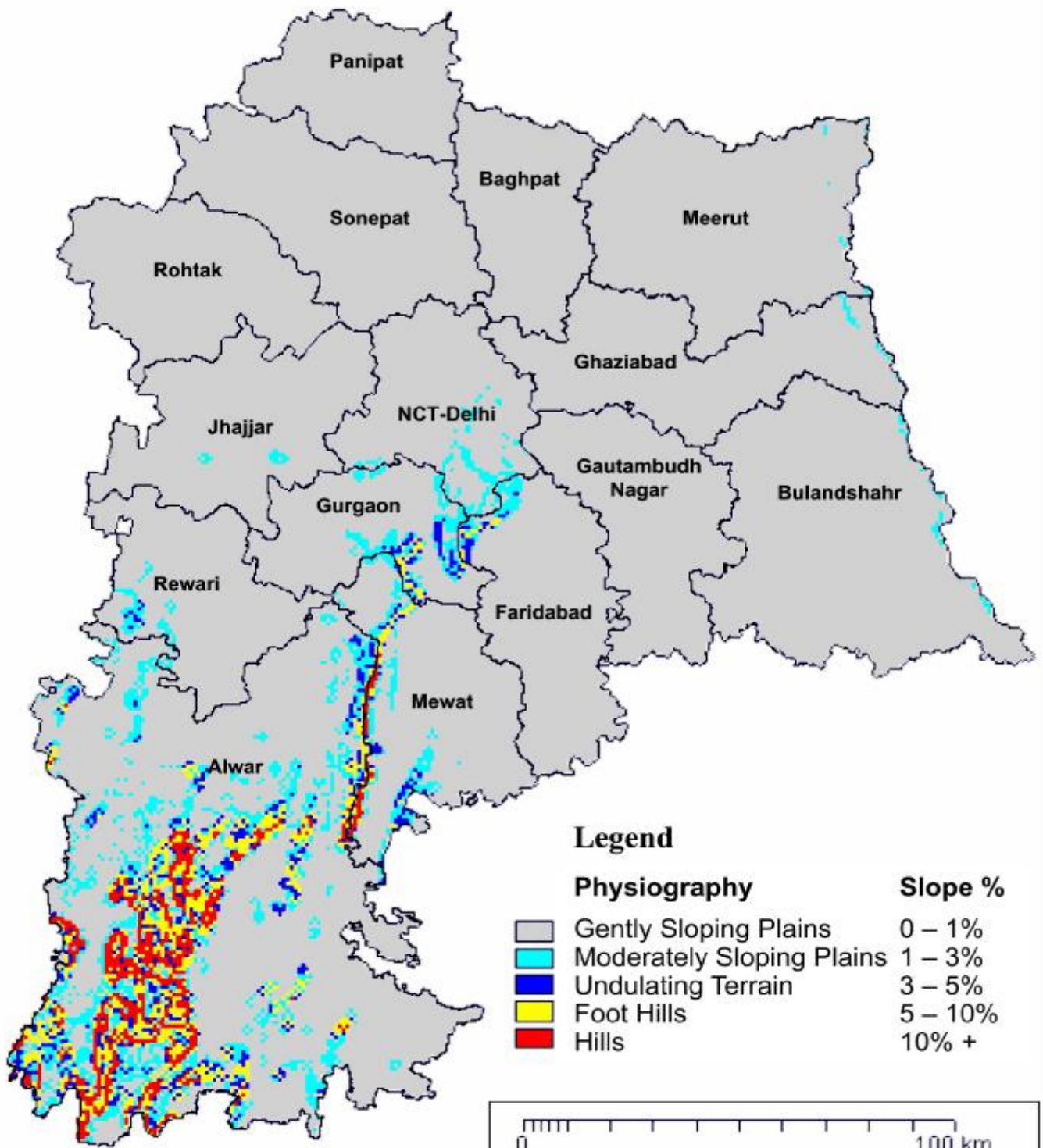
- NCR Boundary
- State Boundary
- District Boundary
- District H.Q.

SUB-REGION	AREA (Sq kms)
NCT-DELHI	1,483
HARYANA	13,413
RAJASTHAN	7,829
U.P	10,853
TOTAL	33,578

NATIONAL CAPITAL REGION PLANNING BOARD

MAP 2.1

NATIONAL CAPITAL REGION PHYSIOGRAPHY AND SLOPE



Source: NRSA Study (Using Global DEM)

thickly bedded, hard, compact and highly jointed and are intercalated with thin beds of Phyllite and Slates.

The strike of the beds is NNE-SSW and dip westerly at moderate angles. These rocks are mostly covered by quaternary sediments and are exposed in isolated residual and structural hills and pediments.

These hills are exposed in south and south-west of Delhi at Delhi, Gurgaon, Rewari and Alwar. The rocks near Delhi consist of narrow strike-ridges and are moderately folded and they are overfolded in the south-east as a series of isoclines (Map 2.3 National Capital Region: Lithology).

2.4 GEOMORPHOLOGY

Topographically the NCR has two major sub-units. The alluvial plains whose monotony is intercepted by isolated hillock or fairly continuous ridges of hard rock and sand dunes not more than 50 metres in elevation from the plain lands surrounding them. NCR terrain around Delhi, Haryana and U.P. constitutes such a plain. Sand dunes are prominent in parts of Haryana and Rajasthan and hard rock ridges bending NE to SW are seen in south and south-west of NCR covering good parts of the Alwar district and Delhi (Map 2.4 National Capital Region: Geomorphic Units).

The Ganga Sub-basin is a major part of the Ganga, Brahmaputra-Meghna basin, the largest river basin in India. The watershed of the Ganga covers almost the entire northern India including Yamuna basin. A clear watershed line divides the area between Ganga basin and Yamuna basin within NCR. The topography of the main Ganga river system varies from rugged hills of the Himalayas to the alluvial plains. The soil generally consists of alluvium deposits in the Gangetic plains.

The Yamuna river system is bounded by the Himalayas on the north and the Vindhya on the south. In the east, it is separated by the ridge from the main Ganga catchment and on the west by the ridge separating it from the Luni and the Ghaggar basins. Most parts of catchment in Haryana and U.P. lies in the Gangetic alluvial plains.

The important tributary of the Yamuna in NCR is the Hindon, which rises from southern slopes of the Shivalik in Saharanpur district of U.P. and ultimately meets the Yamuna from the left downstream of Okhla. The other tributary which is not having a defined course is the Sahibi river, which rises from the hills in Jaipur district of Rajasthan and after flowing through Haryana enters NCT of Delhi through Dhansa Bund into Najafgarh *Jheel* and then joins the Yamuna in NCT of Delhi. The paleo-channels are confined in between the Ganga and the Yamuna courses in the eastern and the central part of the area.

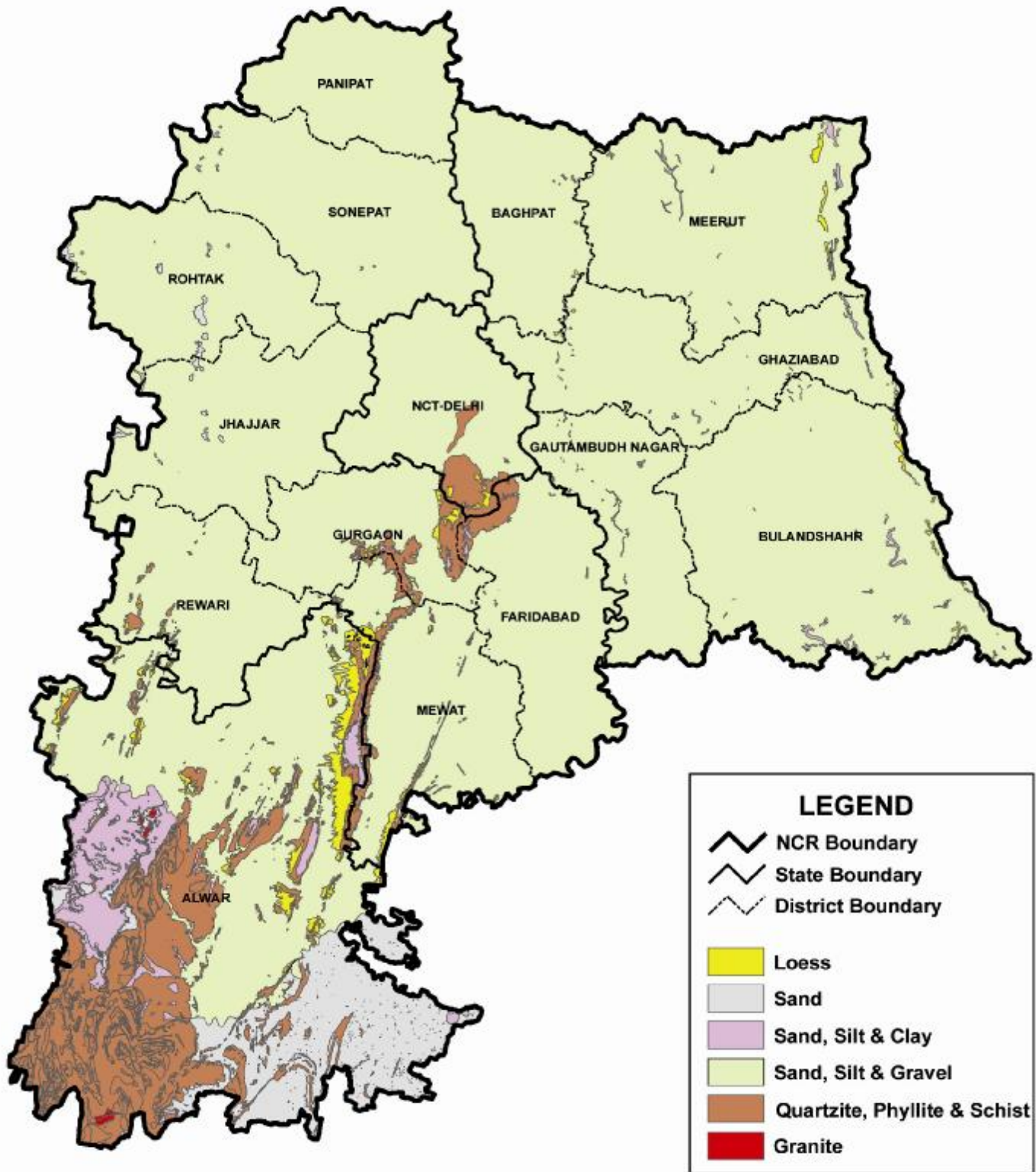
Prominent structural hills in NCR are noticed around Delhi, Rewari, Gurgaon and Alwar. The residual hills are found in and around Rewari, Alwar and Delhi.

The alluvial plain occupies a major portion of NCR and is formed by the Yamuna and the Ganga rivers. The sand dunes are present around Jhajjar and Rohtak in the western part of NCR.

2.5 HYDROLOGY AND AVAILABILITY OF GROUND WATER

The major rivers in NCR are the Ganga, the Yamuna, Hindon and Kali, which flows from north to south and a small part of Sahibi, which flows in the south-western part. Most of the NCR is also predominantly irrigated through well-developed canal network except Alwar and Gurgaon districts, which are irrigated by ground water.


NATIONAL CAPITAL REGION LITHOLOGY



LEGEND

- NCR Boundary
- State Boundary
- District Boundary
- Loess
- Sand
- Sand, Silt & Clay
- Sand, Silt & Gravel
- Quartzite, Phyllite & Schist
- Granite

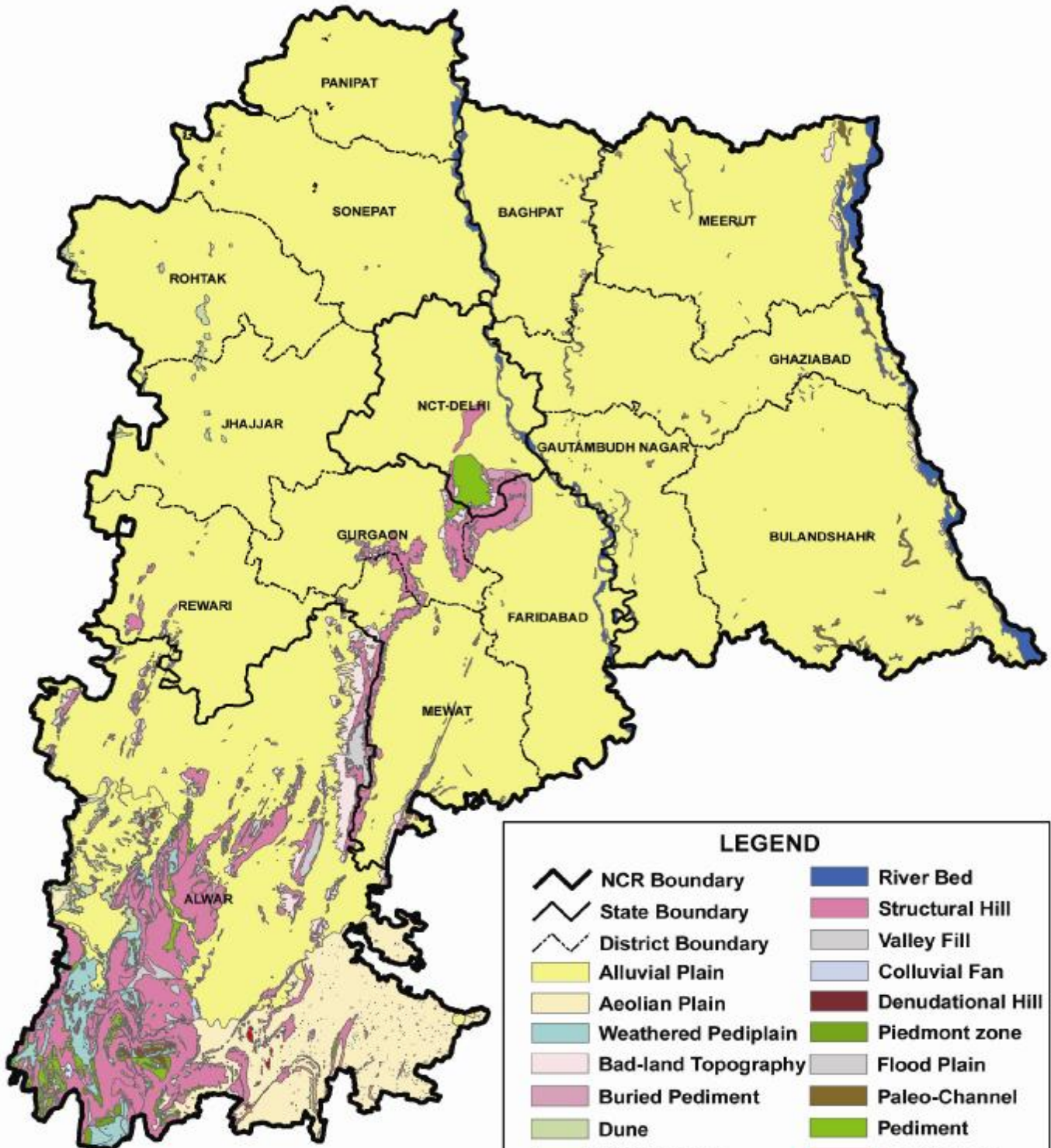
0 5 10 20 30 40 50 Kms

 NATIONAL CAPITAL REGION PLANNING BOARD

MAP 2.3

Source: NRSA Study

NATIONAL CAPITAL REGION GEOMORPHIC UNITS



LEGEND

<ul style="list-style-type: none"> NCR Boundary State Boundary District Boundary Alluvial Plain Aeolian Plain Weathered Pediplain Bad-land Topography Buried Pediment Dune Ox-bow Lake 	<ul style="list-style-type: none"> River Bed Structural Hill Valley Fill Colluvial Fan Denudational Hill Piedmont zone Flood Plain Paleo-Channel Pediment Residual Hill
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NATIONAL CAPITAL REGION PLANNING BOARD
MAP 2.4

Source: NRSA Study

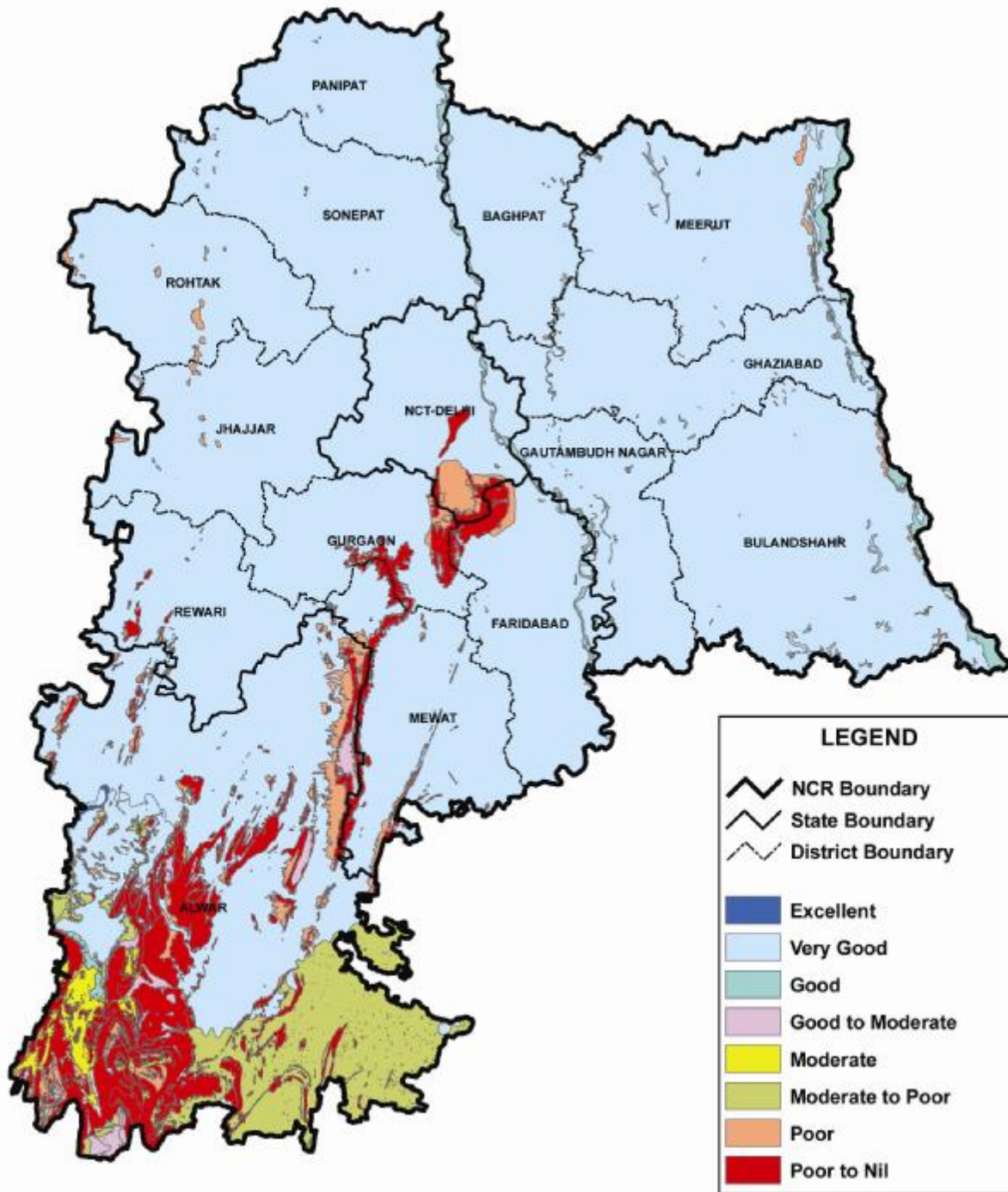
The quartzite and its associated rocks of the Delhi series are traversed by joints and are folded, faulted and fractured. The joints persist deeper down often to about 100 metres depth, which is the maximum depth to which most of the tube wells to date exist. The joints and fractures are open, often filled with debris and mutually interconnected; cavities created by the erosion of mica-schist add to the secondary porosity developed by these joints and fractures. Ground water occurs in the consolidated rocks both in confined and semi-confined conditions. Mostly the top water table zone and the deeper semi-confined aquifer have the same static water level surface because of their interconnections. The depth of water table below ground level varies in general between 5-20 metres. A number of ground water structures by way of open wells and shallow tube wells (60-70 metres deep) exist in this formation in different parts of NCR with varying degrees of discharge rates. On the whole, discharges around 2-3 cubic metres per hour and at times even less (down to one cubic metre) or more (upto 4-5 cubic metres), with an average of about 15-20 metres of the aquifer-zone are available.

The thickness of the alluvium and the proportion of clean granular zones in aggregate within the same are the two main criteria, which determine the availability of ground water in the alluvium. A major portion of NCR is covered by alluvium, which is fairly thick. It is more than 450 metres thick in some parts of Haryana in the upper Yamuna basin (Sonapat, Panipat, etc.). In general, the thickness increases as we proceed towards the northern and eastern areas of NCR away from the hard-rock outcrops, with modifications resulting from tectonics or the bedrock topography sub-surface. Depending upon the thickness of the alluvium, one or more aquifer zones have been identified in the alluvium. The occurrence of ground water sub-area wise, under water table and confined to semi-confined conditions has been described in the following paragraphs (Map 2.5 National Capital Region: Ground Water Prospects).

Phreatic water surface is generally shallow, about 3 to 5 metres below ground level (m.b.g.l.). It could be even as low as one metre or so, in the newer alluvium along the present day flood plains or the low level terraces. Such shallow water levels may be encountered even in the older alluvium. Deeper confined aquifers or medium deep semi-confined aquifers have their piezometric surfaces within about 20-25 m b.g.l. in general.

Open wells, shallow tube wells, gravity wells and deep tube wells are abundant in the areas covered by the alluvium. Their discharges vary anywhere from 18 to 25 cubic metres per hour for about 2 to 3 metres draw downs in the open wells to about 162 per cubic metre per hour for about 8-12 metres draw downs in the deep tube wells tapping granular zones about 70-100 metres in aggregate thickness. As far as ground water quality is concerned, there are few fresh water pockets in the north-east and the south-east corners of NCR area, otherwise in these areas the Total Dissolved Solids (TDS) are more than the desirable limits and the other quality parameters are within the desirable range. The TDS, nitrate and fluorides are more than the desirable limits in the NCT-Delhi area and most parts of the north-west and south-west portions of NCR. However, in the central part of the north-west zone of NCR, fluorides are within the desirable limits.

NATIONAL CAPITAL REGION GROUND WATER PROSPECTS



LEGEND

- NCR Boundary
- State Boundary
- District Boundary
- Excellent
- Very Good
- Good
- Good to Moderate
- Moderate
- Moderate to Poor
- Poor
- Poor to Nil

0 5 10 20 30 40 50 Kms

NATIONAL CAPITAL REGION PLANNING BOARD

MAP 2.5

Source: NRSA Study



AIMS OBJECTIVES AND POLICY ZONES

3.1 AIMS AND OBJECTIVES OF REGIONAL PLAN-2001 & THEIR EFFECTUATION

The Regional Plan-2001, which was notified in January 1989, laid down development policies aimed at:

- (i) relieving the capital city from additional pressures,
- (ii) avoid adding new pressures on the capital and
- (iii) development of settlements in NCR to enable them to play their assigned role.

The objective of the Regional Plan-2001 has been to achieve a balanced and harmonious development of the region, leading to dispersal of economic activities and deflecting future in-migrants to Delhi, thereby leading to a manageable Delhi. In order to achieve these objectives the Regional Plan proposed three policy zones namely NCT-Delhi, DMA and the Rest of NCR.

The broad policy parameters for these zones and the extent to which these have been met during the last two decades are as under:

- NCT-Delhi (1,483 sq kms) to have restricted growth and decentralization of activities concentrated therein to the entire NCR. The Plan accordingly assigned a population of 112 lakhs including two lakhs rural population to this zone as against the estimated population of 132 lakh by 2001, thereby deflecting 20 lakhs people to the Rest of NCR. Against this assignment, Delhi has actually grown to 138 lakhs as per Census 2001 thereby overshooting the estimated population.
- The DMA excluding NCT-Delhi (1,696.85 sq kms) comprising the controlled/development areas of the contiguous towns of Ghaziabad-Loni and NOIDA in Uttar Pradesh, Faridabad-Ballabhgarh complex, Gurgaon, Bahadurgarh, Kundli and the extension of Delhi ridge in Haryana. This zone was proposed to have a population of 38 lakhs (including one lakh rural population) by 2001. However, the Census 2001 has shown that the DMA towns have attained a population of only 28 lakhs, though two of its towns i.e., Faridabad and Ghaziabad-Loni have come up very close to their assigned population, the rest are still far behind, especially Kundli which is still to take off.
- The Rest of NCR comprising an area of 27,063 sq kms for induced development specially of the priority towns/complexes namely Meerut, Hapur, Bulandshahr-Khurja complex, Palwal, Panipat, Rohtak, Dharuhera-Rewari-Bhiwadi complex and Alwar. The Regional Plan-2001 had proposed that out of the additional 20 lakhs population slated to be deflected from Delhi, 19 lakhs would be accommodated in the Priority towns/complexes and one lakh in the rural areas of NCR. Accordingly, a total population of 49 lakhs was assigned to the Priority towns by 2001, against which these towns attained a population of about 28 lakhs as per the Census 2001. They recorded slowest growth rate showing no inducement.

3.2 POLICIES FOR FUTURE DEVELOPMENT: REGIONAL PLAN-2021

It is obvious from the above that the policy to contain the population of Delhi and deflecting 20 lakhs population outside to NCR has met with very little success. Also the induced growth envisaged for the Priority towns in the Rest of NCR has not taken place.

Accordingly, the policy of restricted growth of Delhi has been reviewed and the Regional Plan-2021 proposes "to harness the spread of the developmental impulse and agglomeration economies generated by Delhi for harmonized, balanced and environmentally sustainable spatio-economic development of the NCR with effective cooperation of the participating States".

Therefore, the Regional Plan-2021 aims *"to promote growth and balanced development of the National Capital Region"* as per Section 10, Sub-section (2) of the Act, 1985.

The above aim is sought to be achieved through:

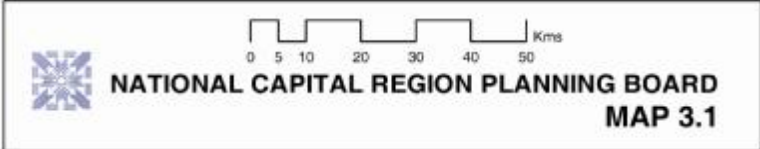
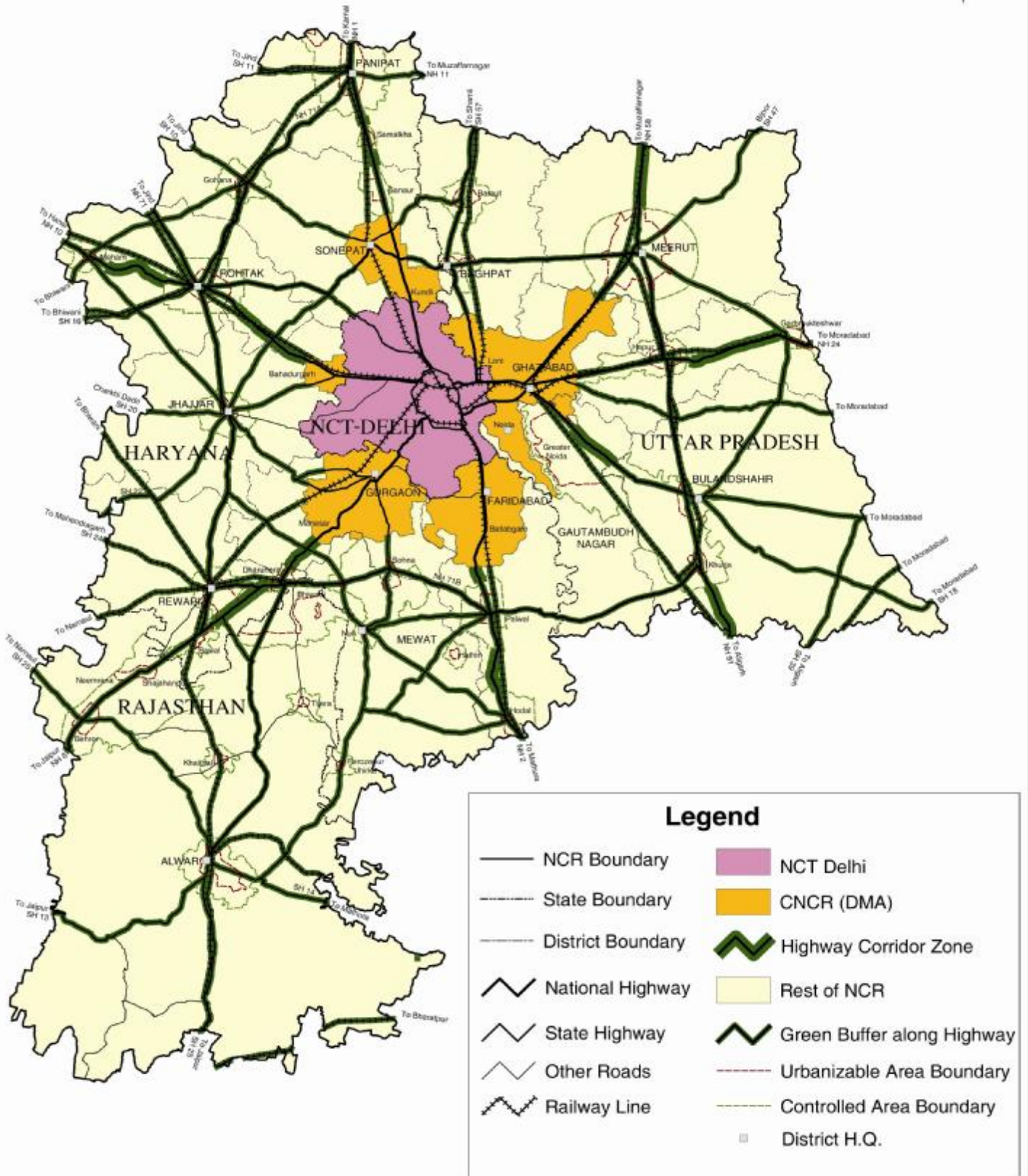
- i) Providing suitable economic base for future growth by identification and development of regional settlements capable of absorbing the economic development impulse of NCT-Delhi.
- ii) To provide efficient and economic rail and road based transportation networks (including mass transport systems) well integrated with the land use patterns, to support balanced regional development in such identified settlements.
- iii) To minimise the adverse environmental impact that may occur in the process of development of the National Capital Region.
- iv) To develop selected urban settlements with urban infrastructural facilities such as transport, power, communication, drinking water, sewerage, drainage etc. comparable with NCT-Delhi.
- v) To provide a rational land use pattern in order to protect and preserve good agricultural land and utilise unproductive land for urban uses.
- vi) To promote sustainable development in the region to improve quality of life.
- vii) To improve the efficiency of existing methods of resource mobilisation and adopt innovative methods of resource mobilisation and facilitate, attract and guide private investment in desired direction.

Keeping the above objectives in view, the Regional Plan-2021 has proposed the development of NCR through four policy zones namely- (i) NCT-Delhi, (ii) Central National Capital Region (CNCR), (iii) Highway Corridor Zone and (iv) Rest of NCR (Map 3.1 National Capital Region: Policy Zones) for which the following development policies have been envisaged.

3.2.1 NCT-Delhi

The basic policy for NCT-Delhi (1,483 sq kms) is to achieve environmentally sustainable development/re-development, taking into account the limitation of developable land and water. No new major economic activities i.e., industries, wholesale trade and commerce, which may result in a large scale job creation, both in formal as well as informal sectors, should be located in this zone. Only activities necessary to sustain the local population of NCT-Delhi should be permitted.

NATIONAL CAPITAL REGION POLICY ZONES



SOURCE: NRSA Study

3.2.2 Central National Capital Region excluding NCT-Delhi

The Central NCR (earlier Delhi Metropolitan Area as defined in Regional Plan-2001) comprised the notified controlled/development/regulated areas of contiguous towns of Ghaziabad-Loni, NOIDA, Gurgaon, Faridabad-Ballabgarh, Bahadurgarh and Sonapat-Kundli and the extension of the Ridge in Haryana. These controlled/development/regulated areas, measuring 1,696 sq kms, have undergone changes. In many cases, new areas have been added.

In view of this, the present notified controlled areas of the above towns of Ghaziabad-Loni, Noida, Gurgaon-Manesar, Faridabad-Ballabgarh, Bahadurgarh and Sonapat-Kundli are designated as Central National Capital Region (CNCR) for Regional Plan-2021. The total area of CNCR (excluding NCT-Delhi) would be 2,000 sq kms approximately.

The opportunities presented by CNCR need to be maximized to enable it to compete effectively with NCT-Delhi offering jobs, economic activities, comprehensive transport system, housing, social infrastructure and quality of environment, if not better at least at par with NCT-Delhi. All new major economic and non-polluting activities wanting to get located in NCT-Delhi should be located in the urbanisable areas planned in this zone.

Keeping in view the physical growth and excessive pressure of development in the CNCR, the participating states will prepare a Plan for their respective areas falling in CNCR and a CNCR Planning Group would be assigned the power to coordinate and harmonize the Plan for CNCR under Section 32 of the NCRPB Act,1985. Emphasis should be given to transportation, civic infrastructure, land use and conservation.

3.2.3 Highway Corridor Zone

A Highway Corridor Zone is proposed with a minimum width of 500 metres inclusive of green buffer on either side of the right-of-way (ROW) along the National Highway (NH) 1, 2, 8, 10, 24, 58 and 91 converging at Delhi to enable the planned and regulated development along these highways outside the existing controlled/development/regulated areas. Area of the Highway Corridor Zone is 300 sq kms approximately.

Activities permitted in the green buffer on both the sides of the highways have been listed in the zoning regulations in Chapter 17. However, in the Highway Corridor Zone excluding green buffer, the land use will be decided by the respective State Governments depending upon economic pressure, local situation and development potential of the area.

The Highway Corridor Zone will be delineated and notified by the respective State Governments. However, utmost care will have to be taken while planning these zones to ensure that the activities being permitted in this zone are segregated from highway traffic through proper green belts, service roads and controlled access to the highways.

3.2.4 Rest of NCR

In the Rest of NCR (approximately 29,795 sq kms), the basic policy of Regional Plan-2001 for accelerated development of both urban and rural areas will continue. Infrastructure has to be substantially upgraded at local and regional level (both by State and Central Governments) in order to induce the growth in these areas, specifically in the identified settlements i.e., Metro Centres and Regional Centres. This will make them more attractive for locating economic and allied activities and for attracting private sector investment.

4

DEMOGRAPHIC PROFILE AND SETTLEMENT PATTERN

4.1 BACKGROUND

According to the Census 2001, India has a population of 102.86 crores, of which the share of urban population is 28.61 crores. The urban share increased from 23.33% in 1981 to 25.72% in 1991 and 27.81% in 2001. Of the total urban population, 38% is accounted for by 35 metropolitan centres (over 10 lakhs) enumerated by the Census 2001. The four mega-cities: Mumbai, Kolkata, Delhi and Chennai together account for more than 17% and about 4.5 % reside in NCT-Delhi (refer Table 4.1).

Table 4.1: Comparative Growth for NCT-Delhi and three Mega-cities in India (1951-2001)

City/ Year	Greater Mumbai UA		Kolkata UA		Chennai UA		NCT-Delhi	
	Population (Person)	Decadal Growth Rate (%)	Population (Person)	Decadal Growth Rate (%)	Population (Person)	Decadal Growth Rate (%)	Population (Person)	Decadal Growth Rate (%)
1	2	3	4	5	6	7	8	9
1951	29,66,902	--	46,69,559	--	15,42,333	--	17,44,072	--
1961	41,52,056	39.95	59,83,669	28.14	19,44,502	26.08	26,58,612	52.44
1971	59,70,575	43.80	74,20,300	24.01	31,69,930	63.02	40,65,698	52.93
1981	82,43,405	38.07	91,94,018	23.90	42,89,347	35.31	62,20,406	53.00
1991	1,25,96,243	52.80	1,10,21,918	19.88	54,21,985	26.41	94,20,644	51.45
2001	1,63,68,084	29.94	1,32,16,546	19.91	64,24,624	18.49	1,38,50,507	47.02
Average		40.91		23.17		33.86		51.37

Source: Census 1951, 1961, 1971, 1981, 1991 and 2001, Census of India

The growth of population in NCT-Delhi, as indicated in the above table, has been much higher than that of the other mega-cities in every decade since 1951. If this growth rate is allowed to continue, the population of NCT-Delhi will overtake even Greater Mumbai by 2021.

4.2 DEMOGRAPHIC PROFILE

4.2.1 Population Distribution and Density

The NCR comprises the entire NCT of Delhi, eight districts of Haryana, one district of Rajasthan and five districts of Uttar Pradesh with a population of over 371 lakhs in 2001. The Sub-regions of NCT-Delhi, Haryana, Rajasthan and Uttar Pradesh accommodated 37.33%, 23.42%, 8.07% and 31.19% of NCR's population respectively. The relative share of NCT-Delhi in the population of NCR has been steadily increasing during the last two decades, as seen in Table 4.2.

Table 4.3 reveals that during the past two decades, the urban share in NCR has registered a higher growth rate as compared to its rural counterpart. The urban share increased from 45.87% in 1981 to 50.23% in 1991 and 56.39% in 2001. However, in NCR excluding NCT-Delhi, the share of urban population in 1991 was only 29% and there has been practically very little increase during 1991-2001. Sub-region wise

urban population growth during 1981-2001 was about 146%, 122%, 137% and 124% in Haryana, Rajasthan, Uttar Pradesh and NCT-Delhi respectively.

Table 4.2: Sub-region wise Distribution of Population in NCR

Sub-region/ Year	Population (Person)			Decadal Growth Rate (%)		Share of Population (%)		
	1981	1991	2001	1981-1991	1991-2001	1981	1991	2001
1	2	3	4	5	6	7	8	9
NCT-Delhi	62,20,406	94,20,644	1,38,50,507	51.45	47.02	31.28	34.43	37.33
Haryana	49,38,541	66,43,604	86,87,050	34.53	30.76	24.84	24.28	23.42
Rajasthan	17,55,575	22,96,580	29,92,592	30.82	30.31	8.83	8.39	8.06
Uttar Pradesh	69,68,646	0,01,704	1,15,70,117	29.17	28.53	35.05	32.90	31.19
NCR	1,98,83,168	2,73,62,532	3,71,00,266	37.62	35.59	100.00	100.00	100.00

Source: Census 1981, 1991 and 2001, Census of India

Table 4.3: Urban-Rural Components of Population in NCR (1981-2001)

Urban-Rural Component/ Year	Population (Person)			Percent share (%)		
	1981	1991	2001	1981	1991	2001
1	2	3	4	5	6	7
Total NCR	1,98,83,168	2,73,62,532	3,71,00,266	100.00	100.00	100.00
Urban NCR	91,20,172	1,37,44,784	2,09,20,074	45.87	50.23	56.39
Rural NCR	1,07,62,996	1,36,17,748	1,61,80,192	54.13	49.77	43.61
Urban NCR excluding NCT-Delhi	33,51,972	52,73,159	80,14,294	24.53	29.39	34.47

Source: Census 1981, 1991 and 2001, Census of India

The density of population in NCR including NCT-Delhi is 1,105 persons per sq km against the all India average of 324 persons per sq km in 2001, while excluding NCT-Delhi it is 724 persons per sq km. The Sub-region wise population density is shown in Table 4.4.

Table 4.4: Sub-region wise Population Density in NCR (2001)

Sub-region/ Year	Density (Person/sq km)	
	1981	2001
1	2	3
NCT-Delhi	4,192	9,340
Uttar Pradesh	642	1,066
Haryana	368	648
Rajasthan*	238	382
NCR	634	1,105

Note: * Corresponds to Rajasthan Sub-region comprising part of Alwar district in 1981 and the entire district in 2001

Source: Census 1981 and 2001, Census of India

The above table reveals that while the overall population density has nearly doubled in NCR as well as NCT-Delhi, in all other Sub-regions it has increased by 50% to 75%.

4.2.2 Sub-region wise Growth of Population

i) NCT-Delhi

The decadal growth of population in the National Capital Territory of Delhi during the period 1951-1991 has been consistently above 50%. However, during the 1991-2001, the population growth declined from 51.45% to 47.02%. Table 4.5 depicts the growth of population from 1901 to 2001.

a) Rural Population

As per the Census 2001, the rural population of NCT-Delhi was 9,63,215. The rural population showed sharp increase during the decade 1981-1991 (109.86%), after which it declined by 0.45% during 1991-

2001. The number of villages also declined from 209 in 1991 to 158 in 2001, mainly due to their inclusion in the urban agglomeration and re-classification/enumeration as urban.

Table 4.5: Growth of Population of NCT-Delhi (1901-2001)

Year	Total		Rural		Urban	
	Population (Person)	Decadal Growth (%)	Population (Person)	Decadal Growth (%)	Population (Person)	Decadal Growth (%)
1	2	3	4	5	6	7
1901	4,05,819	--	1,91,704	--	2,14,115	--
1911	4,13,851	01.98	1,75,907	-08.24	2,37,944	11.13
1921	4,88,452	18.03	1,84,032	04.62	3,04,420	27.94
1931	6,36,246	30.26	1,88,804	02.59	4,47,442	46.98
1941	9,17,939	44.27	2,22,253	17.72	6,95,686	55.48
1951	17,44,072	90.00	3,06,938	38.10	14,37,134	106.58
1961	26,58,612	52.44	2,99,204	-02.52	23,59,408	64.17
1971	40,65,698	52.93	4,18,675	39.93	36,47,023	54.57
1981	62,20,406	53.00	4,52,206	08.01	57,68,200	58.16
1991	94,20,644	51.45	9,49,019	109.86	84,71,625	46.87
2001	1,38,50,507	47.02	9,44,727	-0.45	1,29,05,780	52.34

Source: Census 1901, 1911, 1921, 1931, 1941, 1951, 1961, 1971, 1981, 1991 and 2001, Census of India

b) Urban Population

NCT-Delhi is highly urbanized with 93.18% of its population living in urban areas as against the national average of 27.81%. Table 4.6 depicts the percentage growth of urban population in Delhi during 1951-2001. While only 57.68 lakhs persons lived in Delhi's urban areas in 1981, it more than doubled to 129 lakhs in 2001. During the period 1981-2001, urban population of NCT-Delhi increased by 124%.

Table 4.6: Trends of Urbanization in NCT-Delhi (in Lakhs)

Census Year	1951	1961	1971	1981	1991	2001
1	2	3	4	5	6	7
Percent Urban	82.4	88.75	89.68	92.73	89.93	93.18

Source: Census 1951, 1961, 1971, 1981, 1991 and 2001, Census of India

c) Components of Growth in NCT-Delhi

The main components of the population growth of NCT-Delhi are natural growth and in-migration. The share of natural growth during the period 1961-1971, 1971-1981 and 1981-1991 have been recorded as 54.94%, 55.80% and 59.21% respectively, showing increasing trend while the share of net migration showed a marginal decline from 45.06% during 1961-1971 to 44.20% during 1971-1981 and further declined to 40.78% during the period 1981-1991.

d) Migration

Migration plays an important role in the growth of population of NCT-Delhi. During 1971-1981, there was a net addition of 21.54 lakhs to the population of NCT-Delhi, of which 12.30 lakhs were in-migrants. Between 1981-1991, of the total 32.00 lakhs addition in the population, net-migrant population accounted for 13.05 lakhs. The share of out-migration from Delhi had also been increasing from 2.42 lakhs in 1961-1971 to 2.82 lakhs in 1981-1991. Thus net-migration contributed 44.20% and 40.78% during the decade 1971-1981 and 1981-1991 respectively. However, in absolute terms, the number of migrants was continuously increasing. Table 4.7 presents migration data for Delhi for the period 1961-1991.

As shown in Table 4.8, about 68% of migrants to Delhi belong to the States of Uttar Pradesh, Haryana and Rajasthan. Uttar Pradesh alone accounts for nearly half of the total migrants.

The main reasons for migration into NCT-Delhi as enumerated in the Census 1991 are family movement, employment, marriage and business, which account for 41.45%, 31.29%, 15.62% and 4.07% of migrants respectively during 1981-1991.

Table 4.7: Growth of Population and Migrants into Delhi (1961-1991)

Year	1961	1971	1981	1991
1	2	3	4	5
Population (lakhs)	26.59	40.66	62.20	94.20
Growth Rate (%)	52.44	52.91	53.00	51.45
Growth of Population (lakhs)	-	14.07	21.54	32.00
Component of Migrants (lakhs)				
a) In-migrants	-	8.76	12.30	15.87
b) Out-migrants	-	2.42	2.78	2.82
c) Net-migrants	-	6.34	9.52	13.05
		(45.06%)	(44.20%)	(40.78%)
Component of natural increase (lakhs)	-	7.73	12.02	18.95
		(54.94%)	(55.80%)	(59.21%)

Source: Census 1961, 1971, 1981 and 1991, Census of India

Table 4.8: Migrants classified by place of last residence

Place of last residence	1971-1981 (%)	1981-1991 (%)
1	2	3
Uttar Pradesh	50.09	48.25
Haryana	12.93	11.51
Bihar	5.77	10.69
Rajasthan	7.63	6.00
Punjab	6.40	5.28
West Bengal	2.70	2.72
Madhya Pradesh	3.07	2.64
Kerala	1.47	1.57
Tamil Nadu	1.66	1.52
Maharashtra	2.01	1.44
Himachal Pradesh	1.91	1.41
Others (include outside India)	4.37	6.98
Total	100.00	100.00

Source: Census 1971, 1981 and 1991, Census of India

ii) Haryana Sub-region

The Haryana Sub-region comprises eight districts namely Panipat, Sonapat, Rohtak, Gurgaon, Faridabad, Rewari and the newly created Jhajjar and Mewat districts. Jhajjar district has been carved out from Rohtak district while Mewat district is carved out from Gurgaon and Faridabad districts.

Table 4.9: Growth of Population in Haryana Sub-region (1961-2001)

Year	Total		Rural		Urban	
	Population (Person)	Decadal Growth (%)	Population (Person)	Decadal Growth (%)	Population (Person)	Decadal Growth (%)
1	2	3	4	5	6	7
1961	28,93,365	--	24,32,155	--	4,61,210	--
1971	37,98,228	31.27	31,20,856	28.32	6,77,372	46.87
1981	49,38,541	30.02	37,31,837	19.58	12,06,704	78.14
1991	66,43,604	34.53	48,08,344	28.85	18,35,260	52.09
2001	86,87,050	30.76	57,22,372	19.01	29,64,678	61.54

Source: Census 1961, 1971, 1981, 1991 and 2001, Census of India

Table 4.9 shows that decadal growth rate in the Haryana Sub-region increased from 30% during 1971-81 to 34% during 1981-1991, after which it declined to 30.76% during 1991-2001. The growth of urban population was 78% during 1971-1981 and declined to 61% during the decade 1991-2001. Between 1981 and 2001, the urban population of Haryana Sub-region increased by 146%.

iii) Rajasthan Sub-region

The Rajasthan Sub-region for the Regional Plan-2021 constitutes Alwar district and includes all the 12 tehsils namely Behror, Mandawar, Kotkasim, Tijara, Kishangarh Bas, Ramgarh, Alwar, Bansur, Thanagazi, Rajgarh, Lachhmangarh, and Kathumar.

Table 4.10 shows that population growth in the Rajasthan Sub-region has been relatively constant, ranging between 25-30% since 1971. The growth of rural population in Alwar district during the period 1981-2001 increased from 23% to 29%. The growth of urban population however, depicts a different trend. It was 44.36% in 1961-1971, increased to 63.24% during 1981-1991 and again dipped to 35.80% in 1991-2001. Between 1981 and 2001, the urban population of Rajasthan Sub-region increased by 122%.

Table 4.10: Growth of Population in Rajasthan Sub-region i.e., entire Alwar District (1961-2001)

Year	Total		Rural		Urban	
	Population (Person)	Decadal Growth (%)	Population (Person)	Decadal Growth (%)	Population (Person)	Decadal Growth (%)
1	2	3	4	5	6	7
1961	11,00,372	--	10,12,480	--	87,892	--
1971	14,03,787	27.57	12,76,905	26.12	1,26,882	44.36
1981	17,71,173	26.17	15,74,972	23.34	1,96,201	54.63
1991	22,96,580	29.66	9,76,293	25.48	3,20,287	63.24
2001	29,92,592	30.31	25,57,653	29.42	4,34,939	35.80

Source: Census 1951, 1961, 1971, 1981, 1991 and 2001, Census of India

iv) Uttar Pradesh Sub-region

The districts of Meerut, Ghaziabad, Bulandshahr, Gautam Budh Nagar and Baghpat constitute the U.P. Sub-region. The newly created district of Gautam Budh Nagar has been carved out of Ghaziabad and Bulandshahr districts, and Baghpat district has been carved out of Meerut district.

Table 4.11 shows that as compared to NCT-Delhi, the UP Sub-region has been growing at a much lower rate, around 28-29% since 1981. The urban population, however, has grown at a much faster rate between 1971 and 1991, after which the growth rate declined to 48%. During the period 1981-2001, urban population of UP Sub-region increased by 137%.

Table 4.11: Growth of Population in Uttar Pradesh Sub-region (1961-2001)

Year	Total		Rural		Urban	
	Population (Person)	Decadal Growth (%)	Population (Person)	Decadal Growth (%)	Population (Person)	Decadal Growth (%)
1	2	3	4	5	6	7
1961	44,50,172	--	36,71,496	--	7,78,676	--
1971	54,40,296	22.25	43,51,826	18.53	10,88,470	39.78
1981	69,68,646	28.09	50,19,579	15.34	19,49,067	79.06
1991	90,01,704	29.17	58,84,092	17.22	31,17,612	59.95
2001	1,15,70,117	28.53	69,55,440	18.21	46,14,677	48.02

Source: Census 1961, 1971, 1981, 1991 and 2001, Census of India

4.2.3 Population Projection for 2021

The population projection for NCR for the year 2011 and 2021 is given in Table 4.12. The population of NCR is projected to be 641.38 lakhs by 2021. The share of NCT-Delhi is projected to be 234.87 lakhs

while that of Haryana Sub-region: 160.16 lakhs, Rajasthan Sub-region: 48.06 lakhs and UP Sub-region: 198.29 lakhs by 2021.

The percentage share of NCT-Delhi is expected to decrease from 37.33% in 2001 to 37% in 2011 and thereafter to 36.62% in 2021. In the case of Haryana Sub-region, the percentage share is projected to consistently increase from 23.42% in 2001 to 24.18% in 2011 and 24.97% in 2021, whereas in case of U.P., it may decline marginally from 31.19% in 2001 to 30.92% in 2021.

Table 4.12: Population projections of NCR and Sub-regions (in lakhs)

Year	NCR Total	NCT-Delhi		Haryana		Rajasthan		Uttar Pradesh	
		Population	% to total	Population	% to total	Population	% to total	Population	% to total
1	2	3	4	5	6	7	8	9	10
2001	371.00	138.50	37.33	86.87	23.42	29.92	8.07	115.70	31.19
2011	486.19	179.90	37.00	117.55	24.18	37.91	7.80	150.83	31.02
2021	641.38	234.87	36.62	160.16	24.97	48.06	7.49	198.29	30.92

Source: Census 2001, Census of India and Study Group Report on Policy zones, demography and settlement pattern

4.3 SETTLEMENT PATTERN

4.3.1 Urban Settlements

The number of urban settlements in the region increased from 94 in 1981 to 108 in 2001. Of these, there are 17 Class-I cities (including Delhi Metropolis), 9 Class-II towns, 26 Class-III, 39 Class-IV, 15 Class-V and 2 Class-VI towns in 2001 (refer Table 4.13). The Class-I cities accommodated more than 90% of the total urban population of the region. The rest 10% was distributed among 91 towns of Class-II to Class-VI. Delhi Urban Agglomeration alone accounted for about 62% of the total urban population of the region. The number of metropolitan cities (more than 10 lakhs) in the region increased from one (Delhi) in 1991 to three (Delhi, Meerut and Faridabad) in 2001. The population of Ghaziabad, taken together with the population of Loni town also reached the one million mark.

There are 35 urban settlements in Haryana Sub-region, 9 in Rajasthan Sub-region and 63 in Uttar Pradesh Sub-region. Outside NCT-Delhi in NCR, there are 8 Class-I urban centres in Haryana Sub-region, one Class-I urban centre in Rajasthan Sub-region and 7 Class-I urban centres in Uttar Pradesh Sub-region (refer Map 4.1 National Capital Region: Existing Settlement Pattern 2001).

Table 4.13: Urban Settlements in NCR (2001)

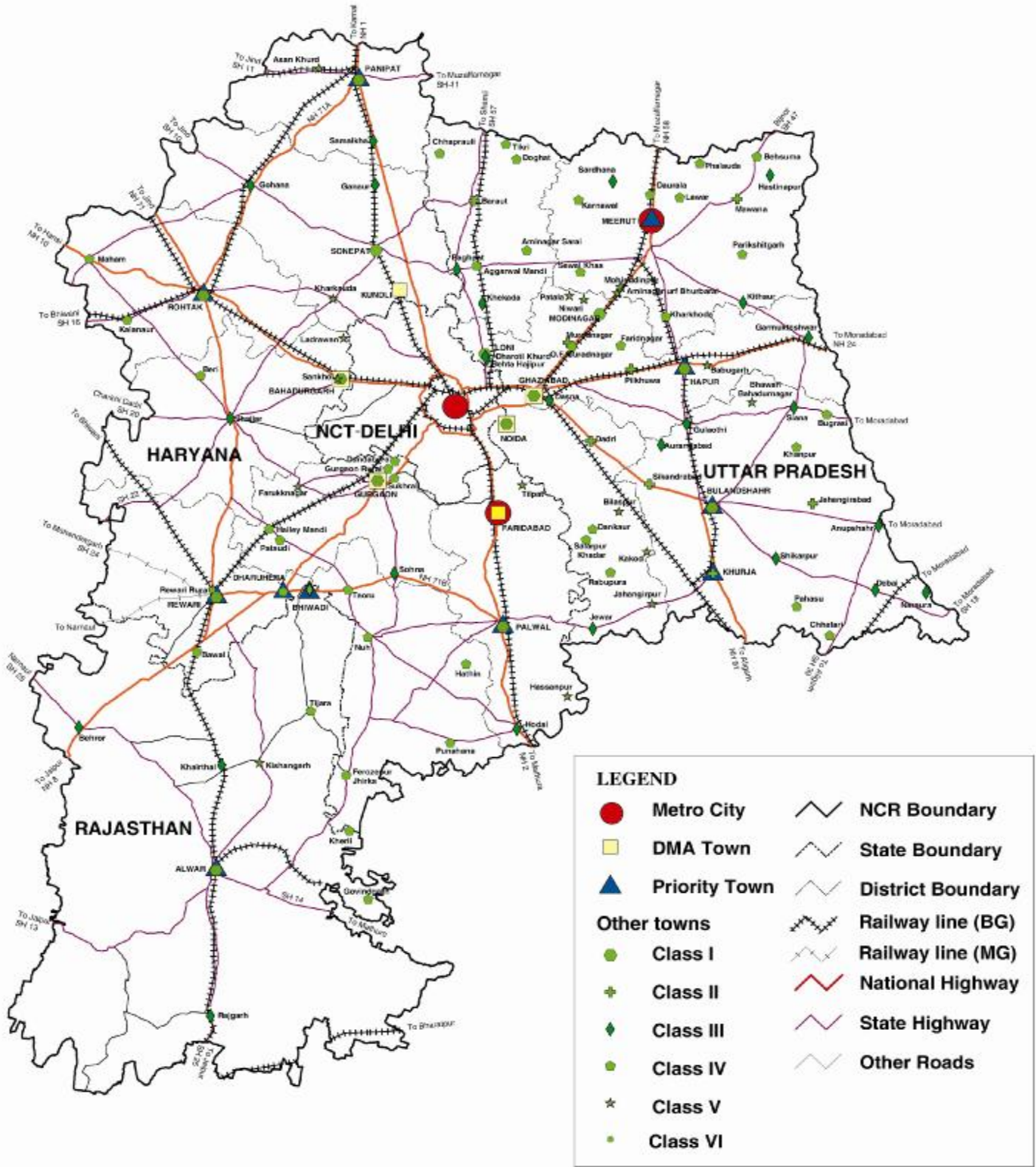
Urban Settlement /Sub-region	Class-I	Class-II	Class-III	Class-IV	Class-V	Class-VI	Total
	100,000 +	50,000-99,999	20,000- 49,999	10,000- 19,999	5,000- 9,999	Below 5,000	
1	2	3	4	5	6	7	8
Haryana	8	0	7	13	6	1	35
Rajasthan	1	0	4	3	1	0	9
Uttar Pradesh	7	9	16	22	8	1	63
NCT-Delhi	1	0	0	0	0	0	1
NCR	17	9	27	38	15	2	108

Source: Census 2001, Census of India

4.3.2 Rural Settlements

According to the Census 2001, there are 7,528 rural settlements of various sizes in the National Capital Region. Of these, 158 were in NCT of Delhi, 2,471 in Haryana, 1,954 in Rajasthan and 3,185 in Uttar Pradesh Sub-regions. More than 162 lakhs persons lived in rural areas in NCR in 2001, accounting for about 44% of its population.

NATIONAL CAPITAL REGION EXISTING SETTLEMENT PATTERN 2001



Source: NRSA Study

4.3.3 Central NCR (earlier DMA) and Priority Towns

The highest order settlements identified in the Regional Plan-2001 were six CNCR towns and eleven Priority Towns/Regional Centres outside NCT-Delhi in NCR. The CNCR towns were envisaged to grow to 37 lakhs against which they actually grew to 28.11 lakhs as per the Census 2001. Of these six towns, the towns of Ghaziabad and Faridabad reached their targeted population, the rest of the CNCR towns could not achieve their target. In fact, Kundli, which was proposed to be developed into a town of 1.5 lakhs, has hardly taken off. In the case of Priority Towns, which were assigned to accommodate 20 lakhs deflected population from Delhi and achieve a total population of 49 lakhs, actually attained a population of hardly 28.17 lakhs, their trend based projected figure.

Table 4.14 indicates that the Priority towns of Meerut, Panipat and Rewari achieved 70% or more of their targeted population while the rest remained much below the assignments. In fact, the overall situation indicates insignificant induced population growth as proposed in Regional Plan-2001.

4.3.4 Policy Issues

The review of the Regional Plan-2001 as well as the results of the Census 2001 has shown that there had not been any perceptible change in the earlier trends. Delhi continued to grow in spite of curbs prescribed in the Master Plan for Delhi (MPD)-1962 and subsequent Plans, the actual population overshooting the assigned or targeted population every time. The National Capital Region has developed, though with a spatial distortion in the sense that only some of the DMA towns adjoining Delhi (Ghaziabad, Noida, Faridabad and Gurgaon) and some of the Priority towns (Meerut and Rewari) have developed.

Table 4.14: Analysis of the Assigned Population Regional Plan-2001 and Actual Population 2001 of NCT-Delhi, CNCR and Priority Towns

Name of Town	Population (Person)			Decadal Growth (%)		Assigned Population in Regional Plan-2001 (Person)	Actual Population as % of Assigned Population (Lakhs)
	1981	1991	2001	1981-1991	1991-2001		
1	2	3	4	5	6	7	8
NCR	1,90,18,909	2,64,46,180	3,71,00,266	39.05	40.29	3,25,00,000	114.15
NCT-Delhi	62,20,406	94,20,644	1,38,50,507	51.45	47.02	1,12,00,000	123.67
NCR excluding NCT-Delhi	1,27,98,503	1,70,25,536	2,32,49,759	33.03	36.56	2,13,00,000	109.15
CNCR (DMA) Towns							
1. Bahadurgarh	37,488	57,235	1,31,925	52.68	130.50	2,00,000	65.96
2. Faridabad	3,30,864	6,17,717	10,55,938	86.70	70.94	10,00,000	105.59
3. Gurgaon	1,00,877	1,35,884	2,28,820	34.70	68.39	7,00,000	32.69
4. Ghaziabad incl. Loni	2,97,429	5,48,320	10,89,201	84.35	98.64	11,00,000	99.02
5. NOIDA	37,000	1,46,514	3,05,058	295.98	108.21	5,50,000	55.47
6. Kundli	-	-	-	-	-	1,50,000	-
7. Total	8,03,658	15,05,670	28,10,942	87.35	86.69	37,00,000	75.97
Regional Centres/Priority Towns							
1. Panipat	1,37,927	1,91,212	3,54,148	38.63	85.21	5,00,000	70.83
2. Rohtak	1,66,767	2,16,096	2,94,577	29.58	36.32	5,00,000	58.92
3. Palwal	47,328	59,168	1,00,722	25.02	70.23	3,00,000	33.57
4. Rewari	51,562	75,342	1,00,684	46.12	33.64	1,10,000	91.53
5. Dharuhera	5,266	10,848	18,892	106.00	74.15	75,000	25.19
6. Meerut	5,36,615	8,49,799	11,61,716	58.36	36.70	15,50,000	74.95
7. Hapur	1,02,837	1,46,262	2,11,983	42.23	44.93	4,50,000	47.11
8. Bulandshahr	1,03,436	1,27,201	1,76,425	22.98	38.70	5,00,000	35.29
9. Khurja	67,119	80,305	98,610	19.65	22.79	3,00,000	32.87
10. Alwar	1,45,795	2,10,146	2,66,203	44.14	26.68	5,00,000	53.24
11. Bhiwadi	1,729	15,285	33,877	784.04	121.64	1,15,000	29.46
Total	13,66,381	19,81,664	28,17,837	45.03	42.20	49,00,000	57.51

Source: Source: Census 1981, 1991 and 2001, Census of India and Regional Plan-2001 of NCR

4.3.5 Strategies for Development of Settlement System

Strategies for the development of settlement system would be to harness the growth impulse of Delhi and to integrate the urban and rural functions in the region. These would be attained by means of a more balanced and mutually reinforcing system of central places and bringing a series of necessary functions to the actual reach of the rural population. Following steps are proposed to achieve these objectives:

- I. Development of a well-knit regional settlement system where Delhi and other towns in the region would be allowed to grow within their carrying capacity and development potential as may be determined by their development/planning agencies and to formulate an overall policy for all types of settlements. In order to make a significant impact and work as a catalyst for development in the National Capital Region, it is proposed to identify four or five Metro Centres or Regional Centres or any other suitable township for development by attracting investment and generation of employment, creation of high-quality infrastructure, robust transport and communication linkages, high-quality residential areas, industrial and commercial complexes. The proposed new townships would be nodes along the key transport corridors, proposed expressways, orbital rail corridors and other suitable locations on virgin land.
- II. Development of small and medium towns in the region as they are Sub-regional centres or service centres. These towns would play an important role in supporting the socio-economic development in their rural hinterland by providing access to education and health facilities, agricultural extension services and agro- industries based on local products.
- III. Rural development would be encouraged by providing facilities and services in appropriate hierarchy which stimulates production and increases income of the rural population, diversify the economy, make villages attractive to live and work and check migration to urban centres.

4.3.6 Proposed Hierarchy of Settlements

Regional Plan-2001 had proposed a four-tier settlement system i.e., Regional Centres, Sub-regional Centres, Service Centres and Basic Villages. Keeping in view the changing demographic scenario of the region, additional categories of settlements have been added and some changes in the nomenclature and functional classification of other settlements are proposed. Henceforth, the following six-tier hierarchy of settlements is proposed in the Regional Plan-2021:

Table 4.15: Proposed Six-Tier Hierarchy of Settlements

S. No.	Hierarchical Level	Population Range
1	2	3
1.	Metro Centre	10 lakhs and above
2.	Regional Centre	3 to 10 lakhs
3.	Sub-regional Centre	0.5 to 3 lakhs
4.	Service Centre	10,000 to 50,000
5.	Central Village	5,000 to 10,000
6.	Basic Village	Below 5,000

a) Metro Centre

As per the Census 2001, in NCR outside Delhi already three towns/complexes namely Ghaziabad-Loni complex, Faridabad-Ballabgarh complex and Meerut have crossed the one million population mark. In addition, the participating States have planned quite a few other Urban Centres for more than a million population in their respective Sub-regions. The towns envisaged/planned to have more than one million population by 2021 are as under.

Table 4.16: Proposed Metro Centres (2021)

S. No.	City/Complex	Proposed Population (in Lakhs)	
		2011	2021
1	2	3	4
1.	Faridabad-Ballabgarh	16.00	25.00
2.	Gurgaon-Manesar	4.50	16.50
3.	Ghaziabad-Loni	19.00	30.19
4.	NOIDA	6.00	12.00
5.	Sonepat-Kundli	3.50	10.00
6.	Greater NOIDA	7.00	12.00
7.	Meerut	15.00	22.00
	Total	71.00	127.69

These settlements can act as powerful growth nodes to attract capital functions and activities and help in population dispersal from the national Capital. Because of their special functional status and size, a very high level of physical, social and economic infrastructure better than that in the Capital is required to be developed within these towns/complexes. This would include efficient intra-urban mass transportation system as well as strong transport and communication linkages with Delhi, other Metro Centres and NCR towns. The respective participating States and their agencies would not only be required to create the necessary infrastructure themselves in these Metro Centres but also facilitate the private sector investment therein.

b) Regional Centre

It is the well-established urban centre in the region, marked by highly specialized secondary and tertiary sector activities and providing job opportunities, which normally cannot be performed by other lower order centres. These centres will be developed for advanced industrial and other economic activities and will have concentration of administrative and higher order service functions, which are expected to exert an increasingly dynamic influence on attraction of investment and creation of conducive living and working environment. The Regional Centres proposed in the Plan are as under:

Table 4.17: Proposed Regional Centres (2021)

S. No.	Regional Centre/Complex	Proposed Population (in Lakhs)	
		2011	2021
1	2	3	4
1.	Bahadurgarh	2.00	3.00
2.	Panipat	5.00	7.00
3.	Rohtak	4.20	6.00
4.	Palwal	1.70	4.00
5.	Rewari-Dharuhera-Bawal	2.00	4.00
6.	Hapur-Pilkhua	3.00	4.50
7.	Bulandshahr-Khurja	3.70	4.77
8.	Baghpat-Baraut	1.60	3.00
9.	Alwar	3.40	4.50
10.	Greater Bhiwadi	1.00	3.00
11.	Shahjahanpur-Neemrana-Behrur	1.00	3.00
	Total	28.60	46.77

Some of the Metro and Regional Centres are in CNCR while others are in the rest of the NCR. Metro/Regional Centres in CNCR and NCR outside CNCR are as follows:

Metro and Regional Centres in Central NCR

1. Ghaziabad-Loni complex

2. NOIDA
3. Faridabad-Ballabgarh complex
4. Gurgaon-Manesar complex
5. Sonapat-Kundli complex
6. Bahadurgarh

Metro and Regional Centres outside Central NCR within NCR

1. Meerut
2. Hapur-Pilkhua complex
3. Greater NOIDA
4. Bulandshahr-Khurja complex
5. Baghpat-Baraut complex
6. Panipat
7. Rohtak
8. Palwal
9. Rewari-Dharuhera-Bawal complex
10. Alwar
11. Greater Bhiwadi
12. Shahjahanpur-Neemrana-Behror complex

The functional composition of the remaining hierarchical centres is being dealt with very briefly in this Plan, since their identification and role would be spelt out in the Sub-regional Plans.

c) Sub-regional Centre

The Sub-regional Centre shall generally be a medium sized town or intermediate city performing a variety of roles, particularly in promoting and supporting rural development, in achieving a more balanced distribution of urban population and in providing functional linkages between the smaller towns and Regional/Metro Centres. The Sub-regional Centres are proposed to undertake the urban economic and service functions and provide for infrastructure like transport, power, water, credit banking, marketing, managerial services etc.

d) Service Centre

The Service Centre shall be a small town or a large village having linkages with immediate rural hinterlands. These centres would cater to the rural hinterland as agro-service centre in the collection and distribution of agricultural goods and services with processing, marketing, warehousing and storage facilities.

e) Central Village

The Central Village is the higher order village having central location and potential for development within its catchment area, with relatively better services and facilities in terms of education, health, communication, accessibility and has the capacity to serve a group of Basic Villages. This centre is proposed to provide basic social facilities for population engaged in agriculture and other primary activities.

f) Basic Village

All other Census villages with a population of less than 5,000 have been classified as Basic Villages and would be provided with basic facilities like link roads, water supply and electricity, paved streets and low-cost common sanitary facilities as well as the minimum required social infrastructure as per planning norms.

4.4 POPULATION ASSIGNMENT

4.4.1 Population Assignment for NCR

Total population of NCR is projected to be 641.38 lakhs by 2021, which is proposed to be accommodated within the region.

4.4.2 NCT-Delhi Sub-region

The population for NCT-Delhi has been projected for 2011 and 2021 as per three different methods as indicated in the following Table 4.18. The projected figure for the year 2021 varies between 224.39 lakhs to 324.96 lakhs.

Table 4.18: Population Projections for NCT-Delhi by Different Methods

Method	Projection (Person)	
	2011	2021
1	2	3
Exponential Growth Rate	1,79,90,327	2,34,86,698
Water's II Formula	2,05,78,059	3,24,96,135
Ratio Method	1,67,24,398	2,24,39,532

However, the most optimal projections place the population figure for 2021 at 234.87 lakhs. Keeping in view the policy parameters laid down for this plan, availability of developable land and water have been considered as limiting factors and accordingly in Annexure 4/I and 4/II the holding capacity of NCT-Delhi has been worked out. Based on these factors, the maximum population, which can be accommodated within NCT-Delhi, comes to 220 lakhs. This works out to a growth rate of 73% for NCT-Delhi between 2001 and 2021. The decadal growth rate works out to be 31.29% during the period 2001-2011 and 31.92% during 2011-2021. In order to synergize the planning of NCT-Delhi and Rest of the NCR, Regional Plan-2021 has proposed a population of 220-230 lakhs for NCT-Delhi by 2021.

4.4.3 Haryana, Rajasthan and Uttar Pradesh Sub-regions

Keeping in view the population assignment for NCT-Delhi additional expected population has been distributed proportionately amongst Haryana, Rajasthan and Uttar Pradesh Sub-regions. The assigned population for NCR is given in Table 4.19.

Table 4.19: Assigned Population of NCR and Sub-regions (in lakhs)

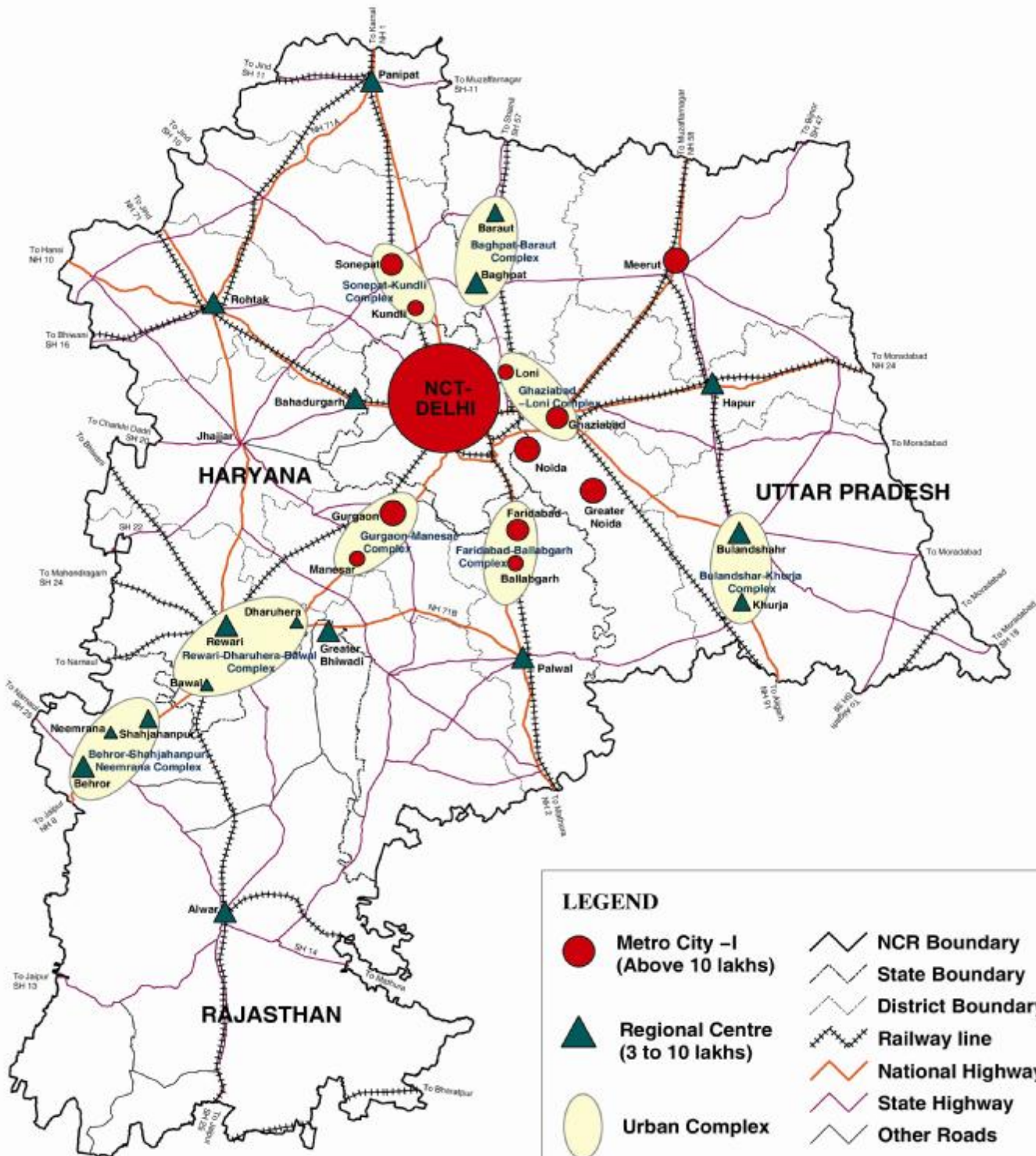
Year	NCR Total	NCT-Delhi		Haryana		Rajasthan		Uttar Pradesh	
		Population	% to total	Population	% to total	Population	% to total	Population	% to total
1	2	3	4	5	6	7	8	9	10
2001	371.00	138.50	37.33	86.87	23.42	29.92	8.06	115.70	31.19
2021	641.38	225.00	35.08	163.50	25.49	49.38	7.70	203.50	31.73

Source: Census 2001, Census of India

4.4.4 Population Assignment for Metro Centres and Regional Centres

Depending upon the potential for development of the towns, the State Governments have assigned population for Metro and Regional Centres (refer Map 4.2 National Capital Region: Proposed Settlement Pattern 2021) for the perspective year 2021. These population assignments were discussed in the 49th Planning Committee meeting and following population assignments for 2011 and 2021 were agreed by the respective State Governments. It was further recommended that firm figures for 2021 be specified after the Census 2011 data is available.

NATIONAL CAPITAL REGION PROPOSED SETTLEMENT PATTERN 2021



LEGEND

● Metro City -I (Above 10 lakhs)	NCR Boundary
▲ Regional Centre (3 to 10 lakhs)	State Boundary
 Urban Complex	District Boundary
	Railway line
	National Highway
	State Highway
	Other Roads

0 10 20 30 40 50 Kms

NATIONAL CAPITAL REGION PLANNING BOARD
MAP 4.2

Source: NRSA Study

Table 4.20: Population for Delhi, Metro and Regional Centres (2011 and 2021)

Name of Town	Population (in lakhs)		
	Census 2001	As finalized by Planning Committee	
		2011	2021
1	2	3	4
NCT-Delhi	138.50	193.00	220.00-230.00
Metro and Regional Centres within CNCR			
Bahadurgarh	1.32	2.00	3.00
Faridabad-Ballabgarh complex	10.56	16.00	25.00
Gurgaon-Manesar complex	2.29	4.50	16.50
Ghaziabad-Loni complex	10.89	19.00	30.19
NOIDA	3.05	6.00	12.00
Sonepat-Kundli complex	2.34	3.50	10.00
Sub-total (excluding NCT-Delhi)	30.45	51.00	96.69
Metro and Regional Centres outside CNCR			
Panipat	3.54	5.00	7.00
Rohtak	2.94	4.20	6.00
Palwal	1.00	1.70	4.00
Rewari-Dharuhera-Bawal complex	1.31	2.00	4.00
Meerut	11.62	15.00	22.00
Hapur-Pilkhua complex	2.12	3.00	4.50
Greater NOIDA	0.30	7.00	12.00
Bulandshahr-Khurja complex	2.74	3.70	4.77
Baghpat-Baraut complex	1.22	1.60	3.00
Alwar	2.66	3.40	4.50
Greater Bhiwadi	0.34	1.00	3.00
Shahjahanpur-Neemrana-Behror complex	0.36	1.00	3.00
Sub-total	30.15	48.60	77.77

4.4.5 Population Assignment for Sub-regional Centres and Other Lower Hierarchy Settlements

The assignment of population to the Sub-regional Centres, Service Centres and Central Villages will be taken up by the participating States at the time of the preparation of Sub-regional Plans. However, the population projections for all the urban centres, given at Annexure 4/III, have been worked out on the basis of past trends and other demographic principles.

5

ECONOMIC ACTIVITY AND FISCAL POLICY

5.1 BACKGROUND

5.1.1 Economic Base

The National Capital Region is characterised by a surge of physical and economic growth of Delhi and underdevelopment of the area outside it. This is primarily a problem of relationship rather than a problem of scarcity, leading to a lop-sided development of the region, where part of the economic surplus of the periphery, which is primarily rural and agriculture based, is extracted by the core and whatever development takes place in the periphery mostly reflects the expanding need of the core. On the other hand the economic strength of the core, rather than being shared with the periphery, remains confined to the core itself and keeps on adding to the gravitation of the core. This 'Centre Periphery' relationship has helped to raise the income levels in Delhi with per capita income of Rs.36,515 (at 1999-2000 prices), as compared to the all India (Rs.15,562) and the surrounding States of Haryana (Rs.21,551), Rajasthan (Rs.12,533) and Uttar Pradesh (Rs.9,765).

Delhi, the Capital city of the nation is the focal point of its socio-economic and political life. There are functions-political, cultural and administrative-peculiar to a capital city. These functions have expanded very fast due to a change in status of this metropolis from an almost Government colonial 'law and order' city to that of the capital of a welfare state. The Government functions have expanded rapidly to cope with added essential functions: foreign embassies, research and cultural organisations and foreign missions. In the rest of NCR, the employment in government and semi-government services is mainly centralised in the district towns viz., Meerut, Baghpat, Bulandshahr, Ghaziabad and Gautam Budh Nagar in U.P. Sub-region; Panipat, Rohtak, Sonapat, Jhajjar, Rewari, Gurgaon, Mewat and Faridabad in Haryana Sub-region and Alwar in Rajasthan Sub-region. The level of these services is much lower being limited to district administration or at best to some divisional functions, which have no comparison with the national/international functions being performed by the Capital.

Industrial activities in NCR have been developing over a span of more than three decades during which substantial structural changes have taken place. Industrial development in NCR, to a large extent, is characterised by the 'Scale Factor' i.e., developments could be easily characterised in terms of large and medium units, small scale industries and development in tiny unorganised units. Within NCT-Delhi, while regulatory mechanisms to a considerable extent did not allow expansion/growth of large/medium scale industries but the lack of regulation and powerful market forces created a laissez-faire situation resulting in mushrooming of small and tiny industries anywhere and everywhere in the unorganized sector, on the other hand in large parts of NCR excluding Delhi, the growth of large and medium industries and small scale industries could be ascribed partly to regulatory mechanisms and partly to historical and causal factors.

The organized industrial sector consisting of the large and medium units and SSI in NCR has developed both in terms of number of units as well as in terms of growth of different industries. In terms of number

of units, electrical machinery, textile products, metal and metal products, food products, repair services and paper and printing units show highest percentage distribution in Delhi. In Haryana Sub-region, units manufacturing engineering goods, consisting of metal products and parts, machine tools and electric machinery show highest percentage distribution. Electric machinery, metal products and parts, chemicals and food products constitute the major sectors in the U.P. Sub-region. In Rajasthan Sub-region, metal products and parts, textile products and transport equipment's along with chemicals, non-metallic mineral products and basic metal products constitute the major sectors.

Trade and commerce form another important component of the economic base of the region. Distributive trade is one of the basic activities in Delhi and this factor has been instrumental in large scale employment generation in both formal and informal sectors. This activity has grown manifold in the post-independence era when Lahore, the erstwhile centre for the distributive trade in North India, became a part of West Pakistan and the entire North India started depending exclusively on Delhi. Besides this, the functional specialization of Delhi, being the centre of political and administrative power, has also resulted in the concentration of banking activities, godowns, transport and communication facilities etc. In the rest of NCR, commercial activities are fairly developed in bigger towns like Meerut, Ghaziabad, Hapur, Khurja and Bulandshahr in U.P. Sub-region, Faridabad, Panipat, Rewari, Gurgaon, Sonapat and Rohtak in Haryana Sub-region and Alwar in Rajasthan Sub-region. However, again in terms of scale of operation, they are nowhere close to Delhi, since the former is limited to local needs within the district or a slightly larger area, while the later operate at national or even international levels.

5.1.2 Changing Scenario

In the intervening period, between the preparation of the Regional Plan-2001 and this Plan, the economic reforms undertaken by the Government of India affecting industrial, trade, fiscal and financial policy changes have brought about a considerable change in the economic scenario in the Country (refer Box 5.1). These changes have posed for the Indian economy both challenge and opportunities. The challenges consist in the fact that, for the first time since the 1950s, Indian economy has been deregulated both in respect of allowing domestic competition, and permitting liberal imports. The opportunities consist in the fact that entrepreneurial decision making, which for about four decades was a close preserve of the Government, dependent on licenses and quotas, now by and large being deregulated, rests with the entrepreneurs and market forces.

Box 5.1

MAJOR CHANGES IN THE ECONOMIC POLICY

- i) Reduction of the number of industries or activities reserved for the public sector.
- ii) The abolition of industrial licensing except for selected industries.
- iii) The new policy on small-scale industry allowing SSI units access to overseas technology and also permitting foreign equity investment.
- iv) Automatic approval to foreign direct investment in selected high priority industries.
- v) Announcement that foreign equity proposals need not necessarily be accompanied in future by foreign technology agreement.
- vi) The formation of a specially empowered Foreign Investment Promotions Board (FIPB) for negotiating with large international firms and approving direct foreign investment proposals.
- vii) Simpler and easier procedure for foreign technology agreement.
- viii) Introduction of convertibility.
- ix) Changes in the Foreign Exchange Regulation Act removing restrictions imposed earlier on companies.
- x) Lowering of customs duties, central excise duties and removal of blanket ban on imports.

The process of globalisation relies primarily on private sector initiative, aided by the evolution of the global information network. Central Government has a very important supportive or facilitating role in this connection. It is also necessary to inspire and motivate the State Governments and their agencies to help them transform themselves into a new role of facilitators rather than controllers.

Reversal of the Government of India's approach towards foreign direct and indirect investments has been the most marked reforms introduced in the new economic policy. Recently the Government decided to allow Foreign Direct Investment (FDI) and also issued certain guidelines for developing integrated townships, subject to planning regulations, with all facilities including urban infrastructure, universities, colleges, institutions and commercial centres etc. Foreign investment can be better achieved if the Central and State Governments play a pro-active role in project identification and development (refer Box 5.2). The participating State Governments of NCR could also consider such integrated development with the help of FDI.

The Indians, who are settled in foreign countries have already established their presence and reputation there. They own and control a substantial chunk of the wealth. It would therefore be possible to attract high technology and foreign investments into India by welcoming these Non-resident Indians, and place NRI-sponsored foreign investments on a higher pedestal than other foreign investments.

Besides general performance of the economy at the national level, the other broad considerations which would go towards facilitating foreign investment and deciding their locations would be the availability of physical, economic and social infrastructure in the form of good transport and communication system, power, social infrastructure, banking and financial services etc. In this context, various procedural complexities related to development of such townships/complexes viz., getting land, the procedural complexities in obtaining the permission of Pollution Control Boards, Electricity Boards and other bodies may have to be simplified and Single Window concept may have to be introduced.

In the industrial sector, the process of economic reforms is slowly percolating to the States. Every State Government is entering the race for attracting more investments from within and outside the country. Earlier too, the State Governments were providing fiscal incentives for new investment but now high pressure and active marketing are also being resorted to. The States are also reviewing their procedures for setting up new industrial units and are opening up infrastructure like power and roads to private sector.

<p>Box 5.2</p> <p style="text-align: center;">FDI GUIDELINES</p> <p>Salient Features</p> <p>Government vide Press Note No. 4 (2001 series) permitted FDI up to 100% for development of integrated townships, including housing, commercial premises, hotels, resorts, city and regional level urban infrastructure facilities such as roads and bridges, mass rapid transit systems and manufacture of building materials. Development of land and providing allied infrastructure will form an integrated part of township's development.</p> <p>2. FDI in the development of integrated townships will be subject to the following guidelines:</p> <p>i) The Foreign Company intending to invest, shall be registered as an Indian Company under Companies Act 1956 and will henceforth be allowed to take up land assembly and its development as a part of Integrated Township Development. All such cases would be processed by FIPB on the recommendation of Ministry of Urban Development and Poverty Alleviation and other concerned Ministries/Departments. Ministry of Urban Development and Poverty Alleviation will develop an exclusive cell to deal with such cases.</p> <p>ii) The core business of the Company seeking to make investment, should be integrated township development with a record of successful execution of such projects elsewhere.</p>

- iii) The minimum area to be developed by such a Company should be 100 acres for which norms and standards are to be followed as per local bye-laws/rules. In the absence of such bye-laws/rules, a minimum of two thousand dwelling units for about ten thousand population will need to be developed by the investor.
- iv) The investing Foreign Company should achieve clear milestones once its proposal has been approved.
 - a) The minimum capitalization norm shall be US\$ 10 million for a wholly owned subsidiary and US\$5 million for joint ventures with Indian partner/s. The funds would have to be brought in upfront.
 - b) A minimum lock-in period of three years from completion of minimum capitalization shall apply before repatriation of original investment is permitted.
 - c) A minimum of 50% of the integrated project development must be completed within a period of five years from the date of possession of the first piece of land.

However, if the investor intends to exit earlier due to reasons beyond his control, it shall be decided by FIPB on a case-to-case basis.
- v) Conditions regarding the use of land for commercial purposes, development charges, external development charges and other charges as laid down in Master Plan/Bye-laws, preparation of layout and building plan, development of internal and peripheral development, development of other infrastructure facilities including the trunk services etc., will be the responsibility of the investor as per planning norms and standards on similar lines as those applicable to local investors. In the absence of such standards and norms, every State Government may decide their own conditions for which the Urban Development Plan Formulation and Implementation guidelines circulated by the Ministry of Urban Development and Poverty Alleviation may serve as a guiding principle.
- vi) Land with assembled area for peripheral services such as police stations, milk booths will be handed over free of cost to the Government/local authority/agency as the case may be.
- vii) The Developer will retain the lands for community services such as (i) schools, (ii) shopping complex, (iii) community centres, (iv) ration shop and (v) hospital/dispensary. These services will be developed by developer himself and shall be made operational before the houses are occupied.
- viii) The developer, after properly developing playgrounds, park, will make it available to the local authorities free of cost.
- ix) The Developer will ensure the norms and standards as applicable under local laws/rules.
- x) For companies investing in Special Economic Zones, Foreign Investment Promotion Board may accord exemption to any of the above mentioned conditions on a case-to-case basis. This will, however, be an interim measure till guidelines are evolved in due course in a need based manner.

The changes in economic policy, the process of privatization of PSUs and downsizing of government, elimination of subsidies and tax incentives for industry are going to change the economic structure of the NCR in a significant manner. With the thrust of the government on more open/market driven economy and the consequent changes in the industrial policy, it is likely that there would be a considerable re-shuffling of industries. Small-scale industries will be exposed to intense competition from larger imports and many may even be wiped out.

The downsizing of government offices and privatization of PSUs is likely to change the locational preferences, which have so far been concentrated in the national Capital. Many industries may relocate themselves due to market driven forces. Service sector will expand very fast, particularly in NCT-Delhi and surrounding areas.

5.2 ECONOMIC STRUCTURE

5.2.1 The Region

The region is characterised by fairly well developed rural as well as urban economy. The economic structure in the region has shown diversification from primary to secondary and tertiary activities in the last three decades wherein the participation in the primary sector declined from about 44% in 1971 to

35% in 1991 in favour of the secondary and tertiary sectors (refer Table 5.1). It is expected that with more than about 70% of the population in the NCR living in urban areas by 2021, the share of primary activities would reduce to about 20%.

Table 5.1: Distribution of Workforce in NCR (1971 and 1991)

Year/ Category of workers	1971		1991	
	Workers	%age	Workers	%age
1	2	3	4	5
Cultivators	12,70,942	32.66	17,90,347	23.16
Agricultural Labourers	4,01,725	10.32	8,21,188	10.62
Livestock, Forestry etc.	44,485	1.14	58,378	0.76
Mining and Quarrying	6,457	0.17	13,884	0.18
Sub-total Primary Sector	17,23,609	44.30	26,83,797	34.71
Manufacturing, Processing				
a) Household Industries	1,66,572	4.28	1,28,661	1.66
b) Other than household Industries	4,64,125	11.93	12,81,140	16.57
Construction	1,07,937	2.77	3,54,049	4.58
Sub-total Secondary Sector	7,38,634	18.98	17,63,850	22.81
Trade and Commerce	4,14,000	10.64	11,37,207	14.71
Transport, Storage and Communications	1,84,839	4.75	4,11,842	5.33
Other Services	8,29,850	21.33	17,34,993	22.44
Sub-total Tertiary Sector	14,28,689	36.72	32,84,042	42.48
Total Main Workers	38,90,932	100.00	77,31,689	100.00
Participation Ratio	27.40		29.00	

Source: Census 1971 and 1991, Census of India

Table 5.2: Workforce Participation in NCR

Sub-region	Participation Ratio		
	1971	1981	1991
1	2	3	4
NCT-Delhi	30.20	31.80	31.51
Haryana	25.02	27.70	28.35
Rajasthan	26.40	25.60	28.00
Uttar Pradesh	27.20	27.00	27.20
Total NCR	27.40	28.70	29.00

Source: Census 1971, 1981 and 1991, Census of India

According to the Census 1991, total main workers in NCR were 77,31,689 representing workforce participation rate in the region at 29%, in contrast to 27.40% in 1971 (refer Table 5.2).

5.2.2 NCT-Delhi

The Census 1991 shows that NCT-Delhi remains the largest growth centre in the region in terms of manufacturing, trading/commercial activities and hence there is higher concentration of employment. The number of workers in manufacturing (both household and other than household) in 1991 was 7.31 lakhs constituting about 52% of the manufacturing in the region. Similarly, the workforce engaged in trade and commerce worked out to 7.10 lakhs accounting for as high as 62% of the overall trade and commerce in the region. Delhi's construction activity was considerably high (2.32 lakhs) constituting nearly 65% of the overall construction force in the region (Table 5.3).

In projecting the industrial composition of the labour force it has been assumed that the shares of the primary sector and household industry would continue to fall while the shares of trade and commerce would continue to rise. The shares of the other sectors have been suggested proportionately. The resulting composition of labour force is shown in the Table 5.4.

Table 5.3: Distribution of Workforce in NCR (1991)

Sub-region	Cultivators		Agriculture labourers		Livestock, Forestry etc.		Mining and Quarrying	
	Workers	%	Workers	%	Workers	%	Workers	%
1	2	3	4	5	6	7	8	9
NCT-Delhi	33,296	1.86	25,195	3.07	19,024	32.59	7,042	50.72
Haryana	6,77,117	37.82	2,86,950	34.94	13,605	23.31	4,462	32.14
Rajasthan	2,22,065	12.40	35,158	4.28	4,087	7.00	2,004	14.43
Uttar Pradesh	8,57,869	47.92	4,73,885	57.71	21,662	37.11	376	2.71
NCR Total	17,90,347	100.00	8,21,188	100.00	58,378	100.00	13,884	100.00

Sub-region	Household Industries		Other than household Industries		Construction		Trade and Commerce	
	Workers	%	Workers	%	Workers	%	Workers	%
1	10	11	12	13	14	15	16	17
NCT-Delhi	41,788	32.48	6,89,163	53.79	2,31,571	65.41	7,09,614	62.40
Haryana	26,371	20.50	2,48,635	19.41	52,744	14.90	1,64,767	14.49
Rajasthan	6,524	5.07	34,083	2.66	8,611	2.43	29,796	2.62
Uttar Pradesh	53,978	41.95	3,09,259	24.14	61,123	17.26	2,33,030	20.49
NCR Total	1,28,661	100.00	12,81,140	100.00	3,54,049	100.00	11,37,207	100.00

Sub-region	Transport, Storage and Communications		Other Services		Total Main Workers	
	Workers	%	Workers	%	Workers	%
1	18	19	20	21	22	23
NCT-Delhi	2,46,490	59.85	9,65,194	55.63	29,68,377	38.39
Haryana	71,813	17.44	3,36,704	19.41	18,83,168	24.36
Rajasthan	11,370	2.76	53,142	3.06	4,06,840	5.26
Uttar Pradesh	82,169	19.95	3,79,953	21.90	24,73,304	31.99
NCR Total	4,11,842	100.00	17,34,993	100.00	77,31,689	100.00

Source: Census 1991, Census of India

Table 5.4: Distribution of Workforce in NCT-Delhi (1991-2021)

Categories	Proportion of Workers (%)	
	1991	2021
1	2	3
Primary Sector	2.85	0.75
Industry	24.68	21.00
Construction	7.80	7.25
Trade and Commerce	23.91	30.00
Transport, Storage and Communications	8.30	8.00
Other Services	32.52	33.00
Participation rate	31.51	38.00

Source: Census 1991, Census of India

5.2.3 Sub-regions

i) Haryana

The work force participation ratio in the Haryana Sub-region increased from 25% in 1971 to 27.7% in 1981 and to 28.35% in 1991 (refer Table 5.2). Workers engaged in agricultural activities were 60% of the total workers as per the Census 1971. It declined to 54% in 1981 and to 51% in 1991 showing thereby diversification of occupations from agricultural activities to non-agricultural activities. The sectors, which registered the maximum increase in per cent share of workers were industries other than household from 8.85 in 1971 to 13.20 in 1991, and other services from 14.24 in 1971 to 17.88 in 1991 (refer Table 5.5).

Table 5.5: Distribution of Workforce in Haryana Sub-region (1971-1991)

Category of workers 1	1971		1991	
	Workers 2	% 3	Workers 4	% 5
Cultivators	4,49,747	46.63	6,77,117	35.96
Agriculture labourers	1,32,687	13.76	2,86,950	15.24
Livestock, Forestry etc.	9,447	0.98	13,605	0.72
Mining and Quarrying	2,501	0.26	4,462	0.24
Household Industries	38,723	4.01	26,371	1.40
Other than Household Industries	85,321	8.85	2,48,635	13.20
Construction	19,355	2.01	52,744	2.80
Trade and Commerce	64,931	6.73	1,64,767	8.75
Transport, Storage and Communications	24,512	2.54	71,813	3.81
Other Services	1,37,363	14.24	3,36,704	17.88
Total Main Workers	9,64,587	100.00	18,83,168	100.00
Population	38,55,568		66,43,604	
Participation Ratio	25.02		28.35	

Note: 1971 figures for workers in livestock etc. include workers in mining and quarrying category

Source: Census 1971 and 1991, Census of India

ii) Rajasthan

The total number of workers in the Rajasthan Sub-region stood at 4.07 lakhs in 1991. The workforce participation ratio increased from 26.40% in 1971 to 25.60% in 1981 and 28.33% in 1991 (refer Table 5.2), mainly because of significant development of industrial and economic activities in the Sub-region. The share of the industrial sector other than household industry increased from 2.46% to 8.38% in the period 1971-91 (refer Table 5.6).

Table 5.6: Distribution of Workforce in Rajasthan Sub-region (1971-1991)

Category of workers 1	1971		1991	
	Workers 2	% 3	Workers 4	% 5
Cultivators	1,35,956	63.08	2,22,065	54.58
Agriculture labourers	19,511	9.05	35,158	8.64
Livestock, Forestry etc.	2,347	1.09	4,087	1.00
Mining and Quarrying	432	0.20	2,004	0.49
Household Industries	8,921	4.14	6,524	1.60
Other than Household Industries	5,299	2.46	34,083	8.38
Construction	2,558	1.19	8,611	2.12
Trades and Commerce	10,717	4.97	29,796	7.32
Transport, Storage and Communications	3,156	1.46	11,370	2.79
Other Services	26,624	12.35	53,142	13.06
Total Main Workers	2,15,521	100.00	4,06,840	100.00
Participation Ratio	26.40		28.33	

Note: 1971 figures for workers in livestock etc. include workers in mining and quarrying category

Source: Census 1971 and 1991, Census of India

iii) Uttar Pradesh

In the U.P. Sub-region, the work force participation ratio remained unchanged at 27% during successive Censuses of 1971, 1981 and 1991 (refer Table 5.2). The sectors which showed a significant growth in per cent share of workers between 1971 and 1991 were industries (other than household) and trade and commerce. The share of workers in the agricultural sector showed a decline from 59.85% to 53.85%. The share of household industries also declined from 6.14% to 2.18% (refer Table 5.7).

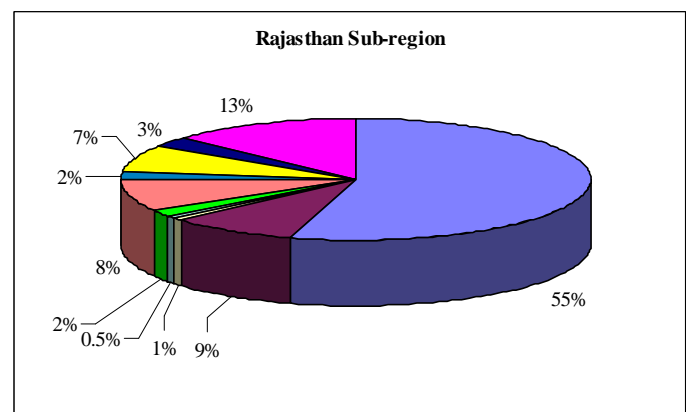
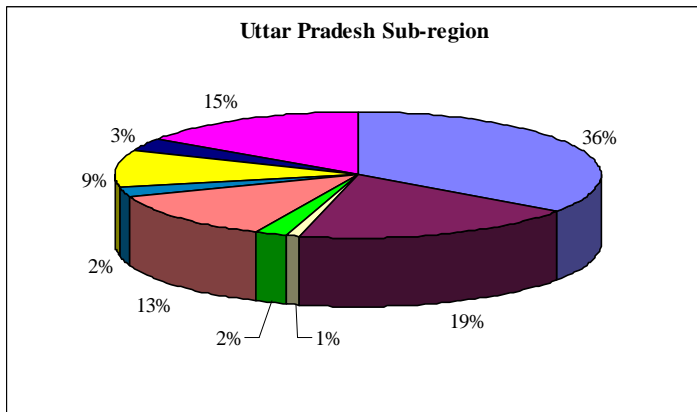
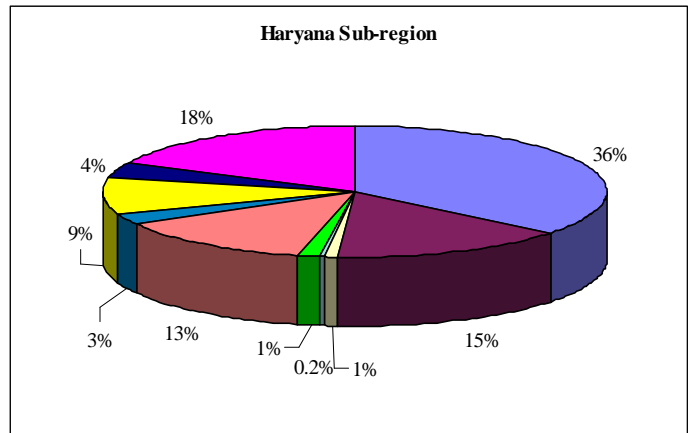
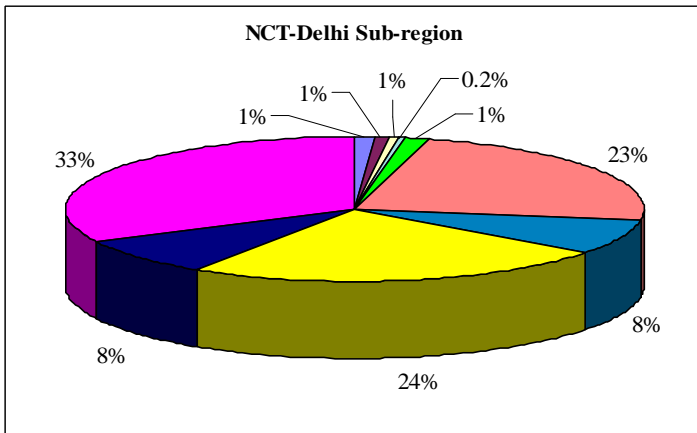
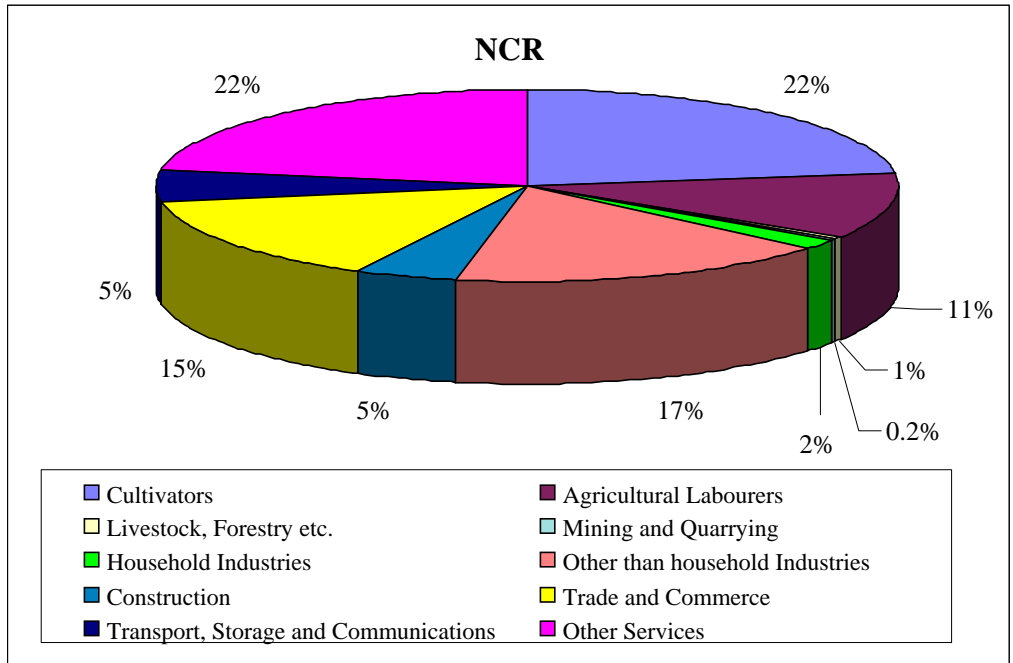


Figure 5.1: Distribution of workforce in the NCR (1991)
 Source: Census 1991, Census of India

Table 5.7: Distribution of Workforce in Uttar Pradesh Sub-region (1971-1991)

Category of workers	1971		1991	
	Workers	%	Workers	%
1	2	3	4	5
Cultivators	6,53,043	44.05	8,57,869	34.69
Agriculture labourers	2,34,258	15.80	4,73,885	19.16
Livestock, Forestry etc.	22,364	1.51	21,662	0.88
Mining and Quarrying	460	0.03	376	0.02
Household Industries	90,998	6.14	53,978	2.18
Other than Household Industries	1,09,850	7.41	3,09,259	12.50
Construction	20,886	1.41	61,123	2.47
Trade and Commerce	93,755	6.32	2,33,030	9.42
Transport, Storage and Communications	42,195	2.85	82,169	3.32
Other Services	214,618	14.48	3,79,953	15.36
Total Main Workers	14,82,427	100.00	24,73,304	100.00
Population	54,40,296		90,01,704	
Participation Ratio	27.25		27.48	

Note: 1971 figures for workers in livestock etc. include workers in mining and quarrying category

Source: Census 1971 and 1991, Census of India

5.2.4 Central NCR Towns

The Central NCR towns, namely, Bahadurgarh, Faridabad, Gurgaon, Ghaziabad, NOIDA, with a workforce participation rate of 29.50% in 1991 had a very low proportion of primary workers (5.16%) a moderately high proportion of secondary workers (37.29%) and a high proportion of tertiary workers (57.55%). Owing to the location of the Central NCR towns close to Delhi, it is expected that they would attract economic activities at a much greater scale and would thus achieve a much higher participation rate. These towns, since they have shown tendency to attract industrial activities, would continue to generate more employment opportunities in this sector. The continued growth in this sector would have to be supplemented and generate more employment in the tertiary sector like trade and commerce and transport, storage, communication and other services. The resulting composition of labour force is shown in the Table 5.8.

Table 5.8: Workers Participation Ratio in Selected Towns of NCR (1981-1991)

Cities /Towns	1981	1991
1	2	3
NCT-Delhi	29.0	31.8
Central NCR (DMA) Towns		
Bahadurgarh	29.7	28.1
Faridabad	33.8	30.4
Ghaziabad	29.0	28.0
Gurgaon	28.0	28.7
NOIDA	--	32.7
Central NCR (DMA) Towns Total	28.2	29.5
Priority Towns		
Alwar	26.7	27.6
Khurja	25.4	25.9
Meerut	28.3	26.9
Rohtak	19.6	27.3
Bulandshahr	26.2	25.2
Palwal	27.4	27.1
Panipat	30.4	30.4
Hapur	26.2	25.3
Rewari	26.9	26.3
Priority Towns Total	26.6	27.1

Source: Census 1981 and 1991, Census of India

Table 5.9: Proposed Occupational Structure in Metro and Regional Centres within Central NCR (2021)

Town/Complex	Participation Ratio	Proportion of Workers (%)					
		Primary Sector	Industry	Construction	Trade and Commerce	Transport Storage and Communications	Services
1	2	3	4	5	6	7	8
Bahadurgarh	35	6.0	30.0	4.0	25.0	10.0	25.0
Faridabad-Ballabgarh	35	2.0	45.0	6.0	16.0	7.0	24.0
Gurgaon-Manesar	35	2.0	40.0	10.0	16.0	10.0	22.0
Ghaziabad-Loni	30	0.5	38.0	6.0	15.0	10.0	30.0
Noida	35	2.0	40.0	6.0	20.0	12.0	20.0
Sonepat-Kundli	35	2.0	40.0	10.0	16.0	10.0	22.0

5.2.5 Regional Centres

The Regional Centres as identified in the Regional Plan-2001 in totality represented a workforce participation rate of 27.10% in 1991 as compared to 26.6% in 1981. The workers participation ratio for CNCR towns and priority towns is shown in Table 5.8. In the context of the policy of deflecting urban population from NCT-Delhi to the Regional Centres beyond the CNCR it may have to be ensured that their participation rate increases. Also, in view of the fact that the manufacturing activities have greater multiplier effect in the expansion of employment opportunities than employment in other sectors, in order to make them more attractive to realise the projected population, these centres may have to have strong industrial content in the workforce. Further these towns would have to have sufficient employment opportunities in the other secondary and tertiary sectors. The resulting composition of labour force in the Metro and Regional Centres as identified in the Regional Plan-2021 is shown in the Table 5.10.

Table 5.10: Proposed Occupational Structure in Metro and Regional Centres outside CNCR (2021)

Town/Complex	Participation Ratio	Proportion of Workers (%)					
		Primary Sector	Industry	Construction	Trade and Commerce	Transport Storage and Communications	Services
1	2	3	4	5	6	7	8
Panipat	32	4.0	40.0	4.0	20.0	12.0	20.0
Rohtak	30	7.0	28.0	4.0	20.0	13.0	28.0
Palwal	30	9.0	15.0	4.0	17.0	21.0	34.0
Rewari	30	9.0	15.0	4.0	21.0	15.0	36.0
Dharuhera	30	5.0	50.0	4.0	16.0	7.0	18.0
Bawal	30	9.0	35.0	4.0	15.0	15.0	22.0
Meerut	32	2.0	29.0	4.0	20.0	9.0	36.0
Hapur-Pilkhua	30	6.0	28.0	4.0	22.0	13.0	27.0
Bulandshahr	30	4.0	40.0	4.0	20.0	12.0	20.0
Khurja	30	4.0	40.0	4.0	20.0	12.0	20.0
Greater NOIDA	35	2.0	40.0	6.0	20.0	12.0	20.0
Baghpat-Baraut	30	4.0	40.0	4.0	20.0	12.0	20.0
Alwar	30	5.0	30.0	4.0	20.0	11.0	30.0
Greater Bhiwadi	30	5.0	50.0	4.0	16.0	7.0	18.0
Shahjahanpur-Neemrana-Behror	30	5.0	50.0	4.0	16.0	7.0	18.0

5.3 ISSUES

5.3.1 Regional Level Issues

The major issue to be resolved for promotion and growth of economic activities in NCR is related to regulation of their location and operation in a manner that will minimise its adverse effects/hypertrophy

of the core on environment both in terms of loss of natural amenities as well as degradation of the natural environment.

Deficiencies in basic infrastructure like power, water, transport linkages, telecommunication etc., which are the pre-requisite for faster economic growth, are evident in most of the towns in NCR. To make these towns self-sustainable and attractive enough for future economic development, concomitant infrastructure needs will have to be met.

NCR being an inter-state region, wide variations exist in the statutory tax rates, as well as tax concessions given to manufacturers on purchase of raw materials and machinery, levy of tariff on various services like power, water and transport etc. This causes diversion of manufacturing activities from one State to another.

Since financial institutions and commercial banks operate within the jurisdiction assigned to them, certain facilities like transfer of loans, commercial transactions etc. are normally not possible or cause delays, which act as hindrance in the relocation and dispersal of the economic activities in the region.

Land being the vital factor for the economic development, the present procedure of acquisition of land through the Land Acquisition Act and the process of transferring it to the development agencies is quite cumbersome. This causes wide gap between demand and supply resulting in location of economic activities in the non-conforming areas and encroachments on private and public land.

5.3.2 Activity Specific Issues

A) Industry

i) NCT-Delhi

In the last four decades preceding 1991, urban Delhi has experienced a significant functional shift in its economic structure in favour of manufacturing and processing activities. In 1951, only about 17% of the workforce was employed in the manufacturing and processing activities, which increased to about 25% in 1991. This happened mainly at the expense of service sector, which declined from 43.66% in 1951 to 33.06% in 1991. There had also been a phenomenal growth of industries in Delhi in the last 2-3 decades, where a sharp increase in the number of units from 26,000 in 1971 to 1,37,000 in 1999 has been recorded and that too largely in unorganized sector, as the planned industrial areas of Delhi have hardly 25,000 plots/industrial sites.

The 1st Master Plan of Delhi recognised the need to put a curb on the industrial activities of Delhi and prohibited certain types of industries, mainly large scale and obnoxious industries from being set up in Delhi. The revised MPD-2001 while recognising the need of restricting the industrial growth of Delhi recommended the growth of only small scale industries. The increase in the industrial employment in the intervening period shows that the curbs prescribed by the Master Plans were not sufficient, nor was there any implementation effort to limit their proliferation.

The phenomenal growth in small scale industries which took place as a result of the prohibition of the large and medium industries is characterised by their continued growth and tendency to concentrate in non-conforming use zones. This had a direct bearing on environmental dimensions of the city. It is mainly because of their limited resources that the SSIs tend to waste material resulting in more pollution per unit of output than other large units. The growing sickness and decline in competitiveness of these units further lend credence to the premise of their low productivity and, therefore, greater pollution potential. In this context the industrial growth needs a major structural correction.

There are more than one lakh unorganised or informal sector units, which are operating in the non-conforming areas. The present factory space in the existing structures in these areas is badly maintained and over utilised. The chemical, plastic, PVC, electroplating units are functioning in excessively insanitary and un-safe conditions. The inadequate availability of the industrial land and in-efficient enforcement of operational and factory regulations are the major causes of the prevailing situation in the informal sector.

Recommendations of shifting of certain heavy and large, hazardous and noxious non-conforming units from Delhi have been made both in the MPD-1962 and MPD-2001. Shifting of industries from Delhi requires decisions on several related issues among various interest groups involved in the process. It is feared that unless all these issues are tied-up it will be difficult to implement these recommendations.

ii) Central NCR (outside NCT-Delhi)

In pursuance to the policies in the MPD-1962 to disperse economic activities in the adjoining towns falling in the Central NCR, the concerned State Governments developed large-scale industrial areas in these towns. This resulted in the concentration of industrial activities in these towns as compared to other parts of the respective sub-regions. This massive built-up of industrial infrastructure in the close proximity of Delhi may pose serious threat to environment in Central NCR including NCT-Delhi, which has now come up as a contiguous mass.

While undertaking industrial development in these towns, matching level of residential, commercial, telecommunications and other facilities have not been developed resulting in sizeable number of workers employed in the industries living in Delhi.

In the above scenario, where on the one hand there is need to upgrade the level of physical and social infrastructure in these towns, on the other, similar controls as proposed for Delhi may have to be made applicable.

iii) Rest of NCR

While taking stringent measures in NCT-Delhi and Central NCR, the search for new industrial areas outside Central NCR may have to be intensified. The NCR hinterland has enough potential to satisfy this urge provided some serious efforts are made to remove bottlenecks, particularly, power, water, telecommunications and transportation.

Specific areas may have to be earmarked for the relocation of polluting and hazardous industries proposed to be shifted outside Delhi, which may be adequately equipped with pollution control and management measures to keep the overall regional environment free from pollution.

B) Wholesale Trade and Commerce

In 1951, urban Delhi had 22.8% of its working force in trade and commerce, which was second to the services sector. Though, by 1981, it maintained more or less the same proportion of workforce (22.26%), it occupied the 3rd position next to services and manufacturing other than household goods. In absolute numbers, however, the workforce increased from 1.17 lakhs to 4.13 lakhs during 1951 to 1981. During 1971-1981 alone, it nearly doubled from 2.4 to 4.13 lakhs. In 1991 the share of trade and commerce rose to 24.97%, again regaining second place after the service sector. The absolute number of workers in this sector rose to 6.73 lakhs.

Most of the wholesale trades in Delhi were established in 19th and 20th centuries and are located in Old Delhi area, in close proximity to one another, and nearer to the railway station. The wholesale activity in

the central city has concentrated in an unplanned manner resulting in congestion, encroachment on public land, traffic bottlenecks and parking problems, besides causing excessive noise in the area.

The major parts of the commodities, which are brought to Delhi, are distributed outside Delhi. The percentage of export items from Delhi were: vegetables and fruits-78%, fuel oil-49%, food grains-47% and iron and steel-44%. Due to the concentration of trade and commerce activities in Delhi, a regional imbalance has been created. The other towns of the region are lacking in economic activities with weak base.

The conventional approach to solve these problems has been the shifting and relocation of wholesale trade activities from the central area, mainly to the peripheral areas of Delhi and, in some cases, even to some regional towns within the NCR. Master Plan for Delhi-2001 has recommended decentralisation on the wholesale trade especially for space extensive materials to be located in the Central NCR towns of Ghaziabad, Faridabad, Gurgaon, Kundli and Loni. In the Master Plan, simultaneous provisions have also been made for markets with the warehouses at Patparganj, Loni Road, Madanpur Khadar, Urban Extension, Najafgarh and northern part of the Urban Extension. In addition, Regional-cum-local district markets have also been suggested in Sub-CBD (Shahdara), Okhla, Rohtak Road District Centre, Shivaji Place District Centre, Wazirpur District Centre, Rohini District Centre and other small markets in the Urban Extension.

Keeping in view the fact that relocation of these activities in Delhi Union Territory would generate more employment opportunities and create congestion in the peripheral areas thereby creating a contiguous expansion, it would be appropriate that alternative additional wholesale markets are developed in the Central NCR towns and the Priority towns in the region and no more such activities are allowed within NCT-Delhi.

C) Government, Public Sector and Commercial/Corporate Offices

In Delhi, the employment in the government offices and PSUs has been increasing rapidly. The setting up of a large number of foreign embassies, foreign missions, research and cultural organisations has also had its distinct impact on the growth of the city. The employment in the various types of the government and quasi-government offices has been constantly increasing ever since 1921.

The employment in Central government offices, which was only 8,000 in 1921, grew to 2.25 lakhs in 1985. During 1941 to 1981, about two lakhs new jobs were added in this sector. The planned attempts to shift certain offices outside Delhi, have not made any dent in the situation. However, there had been a marginal decline in the employment in Central Government offices and it was almost stagnating in the last decade at 2.14 lakhs (1998).

The employment in Government undertakings was only 6,000 in 1961, which leaped to 1.41 lakhs in 1981, adding nearly 1.35 lakhs persons in just two decades. In the decade 1971-1981, about 85 thousand people were provided jobs in these undertakings, which means a total addition of roughly 4.25 lakhs population during the decade 1971-1981 through employment in PSUs alone. During 1981-1991 there has been an addition of 84 thousand jobs in this sector. The employment in this sector, however, declined to 2.05 lakhs in 1998.

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 3,000 employment, which grew to 1.67 lakhs in 1981 and to 2.06 lakhs in 1998.

Over a period of time there had been a phenomenal growth of the private sector offices, banks, multinational companies (MNCs) etc. in Delhi. With the opening up of the Indian market because of the thrust of the Government on liberalisation and economic reforms the tendency of these private sector institutions to locate in Delhi will also further increase.

The continuous addition of office space in NCT-Delhi through planned commercial/office spaces in community, district, sub-city and city centres, and more institutional areas like CGO Complex/Scope Complex on the one hand and allowing unauthorized conversion of non-commercial buildings for this purpose followed by their regularization by permitting change in land/building use, can in no way stop this invasion.

5.4 POLICIES

5.4.1 Regional Level Policies

For the development of economic activities in the National Capital Region, a balance may have to be achieved by adopting appropriate policy measures in the four identified policy zones taking into account the availability of resources, constraints arising out of the environmental factors, land and physical infrastructure like power, water etc.

The policy of development of economic activities in the region should take into account the impact of various proposals made in the Regional Plan-2021, Sub-regional Plans and the Functional Plans. 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.

There should be definite attempt to change the basic character of the regional economy from the agricultural and pre-industrial to more diversified one, in order to raise the earning capacity of the people. By 2021, nearly 70% of the population would be living in urban areas. This would entail the creation of more jobs in non-agricultural occupations, mainly in industry, which has a strong multiplier effect. For this purpose there should not only be an injection of additional activities in existing and new centres outside NCT-Delhi but also development of agro-based industries in rural areas in order to support urbanization on the one hand and to stabilize the rural economy on the other.

In the region, land is generally good for agriculture and hence selection of sites for the development of industrial/urban activities should be done judiciously in strict compliance to development plans of the area and local environment laws.

There is a need for streamlining not only the fiscal and other incentives given by the concerned State Governments but also tax and tariff structure in the region. It should also be possible to rationalise the taxes in Delhi and in the various towns for mutual benefits and in the overall interest of the region. This will also enable free flow of goods and encourage economic development.

5.4.2 Activity Specific Policies

Opening of cities like Delhi to the world economy has necessitated planning for their regions in the global context. With the thrust of the Government on more open/market driven economy and the economic reforms undertaken to this effect, a considerable reshuffling in the economic structure of NCR is expected. The process of privatization of PSUs and downsizing of government, elimination of subsidies and tax incentives for industry etc. are some of the related developments which will contribute to a change in the economic structure of NCR in a significant manner.

Delhi, the Capital city of the nation, is the focal point of its socio-economic and political life. There are functions political, cultural and administrative peculiar to a Capital which accord it comparative advantage in terms of availability of skilled manpower, good supporting physical, social and other infrastructures.

Delhi, being a city state and opening up as a global city in the world economy, more stress may have to be laid on market access in services which is largely driving global growth today. While seeing it in the perspective of an emerging global city, the economic structure in Delhi is likely to undergo a considerable change in the coming decades with an emphasis on the service sector, which already contributes 80% to its GDP. Since the trade in services is expected to have an eminent place in its economy, it is expedient to adopt strategies in order to restrict the concentration and proliferation of less desirable economic activities by banning new industrial areas, wholesale markets and office spaces in Delhi.

The following package outlines an important part of what is broadly involved in the management of NCR, in the forms of planning required in the above context.

- i) Emphasis on investment for the growth of modern infrastructure and services to make the city eventually an e-governed, e-citizen and e-services city so that Delhi becomes the model e-city of India and a destination for foreign investment.
- ii) The city is to be seen as essentially a junction in flows of goods, people, finance, information, etc. The efficient functioning of the modes of transport (road, rail, air) and of inter-modal transfers has become increasingly important in the generation of income of the citizens, and as such should be accorded due importance.
- iii) The information revolution is simultaneously transforming several city activities in many ways: changing in some cases non-tradable services into tradable, for example, health, cultural, higher educational services. This necessitates investments in the appropriate sectors.
- iv) Since retail shopping becomes a key sector relating to the junction and distributional role of cities, to finance, to hotels and restaurants and to tourism, strategies for the expansion of these facilities, as done in Singapore and Hong Kong should be evolved to make it an important export industry.
- v) Development/delivery of cultural services like museums, historic sites, antiques, theatres, film making, cinemas etc., as part of the activities underpinning tourism and other international travel.
- vi) Related to Delhi's emergence as a leading global city is its role in hosting international conferences and sports events, amongst others, which will necessitate an infrastructure of global standards.
- vii) Although Delhi may lose manufacturing activity, but will attract services like accountancy, law, advertising, finance, research and development, consultancy etc. for the factories located/relocated in the green field sites in the neighbouring areas. Adequate provisions for these activities need to be provided in the planning process.
- viii) The Central NCR towns, which have emerged as attractive investment destination because of their proximity, may act as complementary to Delhi in performing these functions. These towns and the rest of NCR may go for inducement of the all types of economic activities and green field projects depending on their comparative advantage.

A) Industry

i) NCT-Delhi

A city like Delhi should opt for an industrial policy, which is highly technology intensive, non-polluting, sophisticated, and high value addition generating. In this context, the primary consideration for location of industry in Delhi should not be the fixed investment limit but should be the limited availability of space, industry related large scale immigration, pollution and strain on already deficient civic services. In order to maintain quality of life and to provide its citizens a better living in terms of clean environment and adequate level of civic services, it becomes imperative that all those manufacturing activities which demand consumption of services viz., power, water, etc. higher than what is permissible in the residential areas should not be allowed.

With these considerations, Delhi should follow a policy which has the following elements:

- Only those industries, which are required, either for marketing and market related activities and/or for providing consumer needs of Delhi's population may be allowed to continue in Delhi.
- The requirements on civic services viz., power, water etc. should not exceed the standards and norms permissible for the residential areas.
- The industries should meet the standards laid down by the local pollution control authorities.
- Only hi-tech industries should be allowed in Delhi
- In the existing industrial areas low-tech industries should be transformed into hi-tech and those which are unable to do so within a reasonable time should be phased out.
- No new industrial area to be created in NCT-Delhi.

ii) Central NCR

- Owing to the location of Central NCR towns adjacent to Delhi, no hazardous, polluting industry should be allowed in Central NCR.
- Hi-tech industries should be allowed to flourish in Central NCR.
- The industries existing before 1986 should be made to conform to Environment Protection Act, 1986.

iii) Rest of NCR outside Central NCR

- The towns selected for priority development should have a strong industrial content, and incentives should be given to all types of industries for creation of infrastructure such as power, water, sewage, drainage, CEPT etc.
- Modern industrial townships/estates should be developed in the area outside Central NCR.
- Specific areas should be earmarked in the region outside the Central NCR for relocation of polluting, hazardous, heavy and large and non-conforming industries proposed for shifting out of NCT-Delhi.

B) Wholesale Trade and Commerce

i) NCT-Delhi

There should not be any special advantage in terms of preferential treatment or lower taxes by way of incentives to wholesale trades in Delhi vis-à-vis the adjoining States. Wholesale trading in plastic and PVC goods, chemicals, timber, food grains, iron and steel and building materials which caters to the whole of NCR and beyond and requiring extensive space may be decentralised by developing suitable additional locations outside Delhi for the purpose. No new wholesale market for any of the following purposes should be established in NCT-Delhi.

- Expansion of activities in wholesale markets of NCT-Delhi e.g. fruit and vegetable markets, iron and steel market etc.
- Resettling the oustees from markets required to be shifted from central/congested areas of NCT-Delhi e.g. grain market in old Delhi etc.

All new markets should be located at suitable locations outside NCT-Delhi in NCR and for making them operational proper legislation like the specified commodities marketing act for the entire NCR needs to be enacted with the concurrence of the participating States.

ii) Central NCR

There are certain wholesale trades and storages in Delhi which involve bulk handling of commodities such as PVC goods, chemical, timber, food grains, iron and steel and building material and are hazardous in nature by virtue of their location in congested localities. Facilities for the functioning of these wholesale trades (as well as others) and related activities should be developed in Central NCR.

iii) Rest of NCR

Incentives for provision of infrastructure facilities should be made available in the various regional towns in order to encourage and accelerate the growth of trade centres on a wider scale within NCR.

C) Government, Public Sector and Commercial/Corporate Offices

i) NCT-Delhi

The main criterion for location of offices in the Capital should be that they perform 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 identified and shifted from NCT-Delhi. Similarly, the public sector offices should be allowed to retain only very small establishments to cater for ministerial and liaison functions. The rest of the establishments should be shifted out of NCT-Delhi. No new office spaces should be created in newly developed community, district or sub-city and city centres. Their role should be limited to providing all levels of shopping facilities. Strict building control should be exercised over unauthorized change of land/building use. No regularization thereof should be allowed. The Central Government and any other organization, body or authority requiring additional space should be allowed to do so only outside NCT-Delhi in NCR and beyond in Counter Magnet Areas (CMAs).

ii) Central NCR

Relocation or expansion of government offices/PSUs which need to perform such ministerial, protocol or liaison functions which make it incumbent upon them to be located in Delhi, alone should be allowed to be located in the Central NCR towns. The opening of new government offices/PSUs or expanding the existing ones should be encouraged in the rest of NCR/CMAs outside NCR.

iii) Rest of NCR

The Central government offices which are considered for being shifted from NCT-Delhi and the Central NCR towns should be located in other towns of NCR and incentives in the form of CCA, HRA etc., as given to employees working in Delhi, should be given to employees who may be affected by this shifting for a limited period. Other incentives like providing government accommodation, allowances for study of their children etc., should also be given.

5.5 STRATEGIES

5.5.1 Regional Level Strategies

i) NCR as Single Economic Zone

Since NCR is an inter-state region it has been felt time and again that the freedom that the States have exercised in fashioning different structures of tariffs and taxes and levying various rates within their local tax/tariff laws can lead to, and in fact in large number of cases have led to, significant differences in economic opportunities which in turn influences choice of people and causes diversion of trade and manufacturing activities. This situation, therefore, is not in consonance with the objectives of the NCR Plan, which proposes dispersal of economic activities over self-contained regional towns, restructuring of the regional transport network, integrated development of the infrastructure etc.

When one attempts to bring about balanced and dispersed development of the region it is imperative to look at NCR as a unified area in economic terms and to smoothen out/eliminate such differences so as to look at NCR as a unified area in economic terms. In spite of constituent parts belonging to different States, for the proper development of the region, there is a need for achieving uniformity in the fiscal policies to be adopted by the constituent States. What needs to be done is to remove all fiscal/physical barriers in NCR to make it One Economic Zone-One Common Market-One Opportunity Zone with a uniform tax and tariff structure.

Uniformity in fiscal policy alone would not be enough to attain the objectives of achieving the concept of 'Common Economic Zone'. The fundamental principle is to make uniformity in the availability of physical infrastructure in all the constituent parts of NCR. The concept of a single 'Common Economic Zone' shall, therefore, also cover those issues where the disparities in the availability of physical infrastructure within the constituent States of NCR are prominent and are not conducive in pursuing the objective of achieving balanced and harmonised development in NCR (refer Box 5.3).

Box 5.3

SCOPE OF COMMON ECONOMIC ZONE

- § Rationalisation of Tax Structure
- § Extending Uniform Financial/Banking services throughout NCR
- § Integrated Rail and Road Transport Network
- § Removing the restrictions on Inter-State movement of taxis and auto-rickshaws between the NCR States
- § Providing Uniform Telecom Facilities throughout the NCR
- § Uniform Power Supply
- § Developing an Integrated Water Supply and Drainage System for NCR
- § Integrated Education Policy
- § Integrated Health Policy
- § Integrated approach for Pollution Control
- § Integrated Law and Order Machinery
- § Provision of adequate financial Resources in Sub-component Plans of participating States and concerned Central Ministries.

ii) Development of Modern Industrial Estates/Townships

Modern Industrial Estates/Townships with all the necessary infrastructures for industry should be developed in NCR outside Central NCR. Simple streamlined procedure should be adopted for the expeditious allotment of land to entrepreneurs in these Estates/Townships so that there is no delay in commissioning of the projects. Simultaneous efforts to provide necessary housing and other social infrastructure should also be made for the industrial workers in the very beginning so that they are not forced to take shelter in unauthorised colonies which may later grow into slums.

iii) Single Window Facility

Single window system of registration, financing and industrial regulatory measures should be set up.

iv) Liberal Incentives

In order to encourage the industries to be located in NCR, liberal incentives in terms of creating infrastructure should be given to the new units as provided in the industrial policy framework of the States.

v) Rural Industrialisation

The rapid growth of population of Delhi is mainly due to immigration of people in search of employment from the rural areas where the capacity to generate employment is either exhausted or under-utilised. Thus, there is a need to develop agro-based industries in the rural areas in order to support urbanisation in NCR as a whole on the one hand and to stabilise the rural economy on the other. In the long run this will prevent exodus of people from rural areas to Delhi. Studies have shown that the lower order settlements in NCR (service centres and basic villages) have enough localised traditional skills like potteries, handloom weaving, leather work, murtikari, carpet weaving etc., which if properly nurtured can play the role of a vibrant component of the rural economy and provide gainful employment to potential migrants to Delhi.

vi) Training and Skill up-gradation

In view of the demand for diversification and expansion of industrial activities in NCR, there is an immediate need of strengthening and upgrading the training facilities in the region. Introduction of new courses, specially in hi-tech areas, regulatory controls, supervision and maintenance of uniform standards and curricula, particularly in privately run institutions are some of the areas which need consideration.

5.5.2 Area Specific Strategies

A) NCT-Delhi

Thrust Areas

(a) Service Sector

In the process of Delhi emerging as a global/international city, the thrust on the service sector, as highlighted in the foregoing paragraphs, has become a crucial element in determining the income of the city. It could further be justified given the fact that the contribution of the service sector in Delhi's GDP has already touched about 80%, which with the value addition and effective taxation of services, is likely to multiply enormously. The transition of the economic structure of Delhi in favour of the service sector would have an added advantage of utilizing its skilled employment thereby also restricting the entry of unskilled migrant labour. It need not be stressed further that in the changed environment, Delhi would be a hub of a large number of service related activities and accordingly this factor needs to be taken care of by emphasizing a particular endowment of infrastructure which facilitates growth of this sector. The service sector could be suitably allowed to operate in residential areas provided it functions within the norms permissible for the consumption of power, water etc. in these areas.

(b) Hi-tech Industries

Delhi has the following resources and facilities readily available for promotion of hi-tech industries (refer Box 5.4).

- i) Highly qualified manpower because of location of IIT, DCE and other technical institutions.

- ii) A large number of centres of excellence in the field of science & technology like NPL, NIC, C-DOT, CSIR, etc. are located in Delhi and can provide for quick and easy interaction between the industry and the R&D centres.
- iii) Delhi is one of the important hub centres of National Telecom Network.
- iv) Location of all embassies in Delhi will give an edge to the exports/imports of technology.

<p>Box 5.4</p> <p style="text-align: center;">POTENTIAL GROWTH AREAS IN HI-TECH</p> <ul style="list-style-type: none"> i) Computer hardware & software industry and industries doing system integration using computer hardware and software. ii) Packaging iii) Industries integrating & manipulating the interfaces of the computers and telecom facilities. iv) Industries catering to the information needs of users by providing databases or access to databases spread throughout the globe. v) Industries providing the facilities for sophisticated testing of different or all components of the information technology. vi) Electronic goods. vii) Service & repair of TV and other electronic items. viii) Photo composing and Desk Top Publication. ix) TV and Video programme production. x) Textile designing and Fabric Testing etc. xi) Bio-technology xii) Telecommunications and IT enabling services xiii) Gems and Jewellery
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(c) Household Industry

Household industries, since they are required either for providing or servicing the day-to-day needs of Delhi's population, should be allowed to operate in the residential areas provided they are non-polluting and fulfil the prescribed norms.

Setting up of Front Offices to provide linkages

Delhi being the major marketing outlet, the financial capital of north India and the seat of the Central Government, every industry wants to have a front office here, from where all national and international transactions and liaison work can be handled. As such, it is desirable to have split units of industries where the main industry can be located in NCR towns while their front offices can be located within Delhi.

Joint Venture Projects

Delhi, with its experience and expertise, should participate in the industrial development in NCR. The Delhi Administration should take up projects on 'joint venture' basis with the counterpart agencies (UPSIDC, HSIDC and RIICO) of the participating States. For this purpose, the jurisdiction of the Delhi State Industrial Development Corporation (DSIDC) and Delhi Finance Corporation (DFC) should be enlarged to cover their area of operation in these States.

Transforming from low-tech to hi-tech

In the existing industrial areas the low-tech industries should be transformed to hi-tech in a phased manner.

Multi-storeyed flatted factories

Multi-storeyed flatted factory complexes should be constructed to save space and to have better management of services.

Common advertisement for relocating non-conforming units

Common advertisements indicating the sites available in Delhi, along with sites available in NCR towns, should be published for relocating non-conforming units ordered to be shifted by the Supreme Court so as to give entrepreneurs varied options for relocation. Similar concessions as being given for their relocation in Delhi should be given for other towns also.

B) Rest of NCR excluding NCT-Delhi

Suggested locations

Industry

The Central NCR towns and the Regional Centres, selected in the Regional Plan for induced development, have been envisaged to play a significant role and would have a strong industrial content. Besides this, the Sub-regional Centres, which would be identified in the Sub-regional Plans, prepared by the respective State Governments, will also serve as the first stage industrial centres.

The strategy to develop may entail following elements:

- These locations to be developed as model industrial areas/Special Economic Zones (SEZs) [refer Box 5.5] equipped with facilities such as uninterrupted power supply, efficient telecommunications network, transportation and warehousing facilities, common effluent treatment plants and industrial and potable water supply.

It is suggested that the State Governments may consider identifying locations, at least one SEZ in each State.

- The decision of the Government to allow Foreign Direct Investment in the development of integrated townships would go a long way in attracting private sector participation in the development of townships and key industrial infrastructure facilities like power, water supply, telecommunications etc.
- Establishment of a single window system of registration, financing and industrial regulatory measures.
- In order to encourage industries to be located in NCR, liberal incentives for creation of infrastructure facilities be given to new units as provided in the industrial policy framework of the States.

Box 5.5

SPECIAL ECONOMIC ZONES

Salient Features

Special Economic Zone (SEZ) is a specifically delineated duty free enclave and shall be deemed to be foreign territory for the purposes of trade operations and duties and tariffs.

Goods going into the SEZ area from Domestic Tariff Area (DTA) shall be treated as deemed exports and goods coming from the SEZ area into DTA shall be treated as if the goods are being imported.

SEZ units may be set up for manufacture of goods and rendering of services, production, processing, assembling, trading, repair, remaking, reconditioning, reengineering including making of gold/silver/platinum jewellery and articles thereof or in connection therewith.

SEZ units may export goods and services including agro-products, partly processed jewellery, sub-assemblies and component. It may also export by-products, rejects and waste scrap arising out of the production process.

SEZ unit may import without payment of duty all types of goods, including capital goods, as defined in the Policy, whether new or second hand, required by it for its activities or in connection therewith, provided they are not prohibited items of imports in the ITC (HS). The units shall also be permitted to import goods required for the approved activity, including capital goods, free of cost or on loan from clients.

SEZ units may procure goods required by it without payment of duty, from bonded warehouses in the DTA set up under the Policy.

SEZ units may import, without payment of duty, all types of goods for creating a central facility for software development can also be accessed by units in the DTA for export of software.

Gems & Jewellery and Jewellery units may also source gold/silver/platinum through the nominated agencies.

SEZ units may also import/procure from DTA specified goods without payment of duty and subject to such conditions, as may be notified by the Government, for setting up of units in the Zone.

Wholesale Trade

In a study commissioned by the NCR Planning Board, based on various factors affecting location of wholesale trade such as volume of commodity flow, direction of flow, trade linkages, mode of transport, preferences of traders etc., locations have been suggested for seven major commodity groups being handled in NCT-Delhi (refer Box 5.6).

Box 5.6

WHOLESALE TRADE-SUGGESTED LOCATIONS

Food grains	Panipat, Hapur and Kundli (Sub-regional level)
Fruit and Vegetables	Panipat (for apples and vegetables); Hapur (for potato and onion); Kundli (mango and vegetables)
Textiles and Readymade Garments	Meerut and Rohtak
Iron and Steel	Ghaziabad, Faridabad/Gurgaon
Auto Parts	Faridabad
Fuel Oils	Rewari
Hardware and Building materials	For hardware-Ghaziabad; For building material-Alwar, Dharuhera or Bhiwadi

Alternative wholesale markets for the above commodities could be developed by the concerned agencies of the State Governments as 'joint venture' projects and also declaring these commodities under the 'Specified Commodities Act' as explained under the head 'Institutional Machinery' at various Regional Freight Complexes.

5.6 INFORMAL SECTOR

There is a sizeable presence of informal sector activities and enterprises in various towns in the National Capital Region, which produce comparatively inexpensive wage goods and services while providing abundant opportunities for self-employment to a large section of population. This unorganized sector has come to be recognized as an important segment of urban human activity which is making positive contributions to the growth and economic development of these towns and, through them, to the entire region.

Some of these activities are being carried out since long and are also well recognised from the point of view of specialisation and export potentials (refer Box 5.7).

Box 5.7**INFORMAL SECTOR ACTIVITIES**

Alwar	: Engineering and metal work, leather work, murtikari, carpet weaving and pottery
Meerut	: Handloom, sports goods and scissors and blades industry
Khurja	: Pottery and ceramics
Panipat	: Handloom industry
Rewari	: Brassware
Mewat	: Potteries

It is, therefore, necessary to address the informal sector in all its ramifications and evolve appropriate strategies to cater to the basic needs of its constituents population by way of shelter, workplace, social amenities and financial support so as to facilitate their growth and, at the same time, mobilize their skills and entrepreneurship for the benefit of the society at large.

The traditional type of retail shopping in the form of 'Weekly Market' is quite popular in the towns of NCR and NCT-Delhi. The functioning of these markets need to be improved by providing parking and other open spaces. There is also a need to provide organized informal sector places, to be located strategically near work centres, commercial areas, near schools, colleges, hospitals, transport nodes etc. The role played by the street vendors in the economy as also in the society needs to be given due credit. The policy should be to provide and promote a supportive environment for earning livelihoods, as well as ensure absence of congestion and maintenance of hygiene in public places and streets.

Under the strategy for accelerated development of NCR, the informal sector would be poised to claim a large share of the induced population growth and income generation. An attempt, therefore, is to be made to absorb the informal sector, as far as possible, particularly within the fabric of planned urban development and economic growth of the integrated townships which are at the core of the envisaged development strategy for NCR.

5.7 INSTITUTIONAL MECHANISM

As regards the setting up of institutional mechanism to ensure joint action for timely implementation in each and every case, it is felt that such a mechanism could only be worked out when detailed time-bound functional plans for different sectors of the core economic activities are prepared. This mechanism will, however, differ from case to case.

In general, it was felt that a mechanism consisting of a mix of the following may help to achieve the required objectives:

- i. Guidelines, which establish 'give and take' relationship between the 'exporting authority' (i.e., Delhi Administration) and the receiving authority (i.e., concerned State Government). This will include package of incentives and concessions offered by these authorities and who is to do what. This can be in the form of resolution of the Board in lieu of statutory provisions as done in United Kingdom in the form of the Town Development Act, 1952.
- ii. To ensure optimal linkages with NCT-Delhi in the development of the core economic activities such as industrial estates, wholesale markets, commercial complexes etc., joint venture projects could be set up on partnership basis between the development agencies of NCT-Delhi and their counterpart in the participating States.

- iii. Evolving a common “Specified Commodities Marketing Act” to enable the dispersal of wholesale distributive trades to the NCR towns.

With the fast growth of population and commercial activities, the congestion and consequent traffic and other problems particularly in old Delhi along the outer and inner Ring Roads and the main arteries leading to Delhi, the necessity of relocating wholesale markets is increasingly felt, specially of those that involve bulk handling of commodities such as PVC goods, chemicals, timber, food grains, iron and steel, building material and hazardous in nature, to CNCR and Priority Towns in NCR.

Since NCR is an inter-state region, there is no provision of law available to enable the Government of NCT of Delhi (GNCTD) to take appropriate steps for relocating such markets in NCR towns. It is, therefore, necessary to enact a law to regulate the location of market areas and wholesale markets in respect of commodities specified from time to time under such law and to establish market committees to manage and control different markets established for different commodities in different areas.

The Specified Commodities Market Act would be on the lines of Agricultural Produce Marketing Act, enacted to shift wholesale markets for some of the agricultural produce. This Act will be operative in entire NCR.

- iv. Aggressive marketing by the various development agencies of the State Governments (in the light of benefits accruing out of ‘give and take’ relationship).

5.8 SUPREME COURT ORDERS

A major thrust in this direction came from the Honourable Supreme Court, which has issued orders for the closure of certain industrial units and asked them to move out of the Capital as they are not permitted under the law. In this context, the Supreme Court took note of the provisions of the Delhi Master Plan which asked all such units to give their relocation plan within one year of the notification of the Master Plan in 1991 and shift thereafter in the next two years to NCR. It also took note of the provisions of the NCR Planning Board Act, 1985 and the Regional Plan-2001 (refer Box 5.8).

Box 5.8			
SUPREME COURT ORDERS			
S. No.	Order Dates	Industries to be Shifted/ Closed Down	Closing Date
1.	08.07.96	168 Industries	30.11.96
2.	06.09.96	513 Industries	31.01.97
3.	10.10.96	43 Hotmix Plants	28.02.97
4.	26.11.96	246 Brick Kilns	30.06.97
5.	26.11.96	21 Arc/Induction Furnaces	31.03.97
6.	19.12.96	337 Industries	30.06.97
Directives			
i) The allotment of plots, construction of factory buildings, etc. and issuance of any licenses/permissions etc. shall be expedited and granted on priority basis.			
ii) In order to facilitate shifting of industries from Delhi, all the four States constituting the NCR shall set up a Unified Single Agency consisting of all the participating states to act as a Nodal Agency to sort out all the problems of such industries.			
iii) The single window facility shall be set up by the four states.			

iv) The use of the land which would become available on account of shifting/relocation of the industries shall be permitted in the following manner:

S. No.	Extent	Percentage to be surrendered and dedicated to the DDA for development of greenbelts and other spaces	Percentage to be developed by the owner for his own benefit in accordance with the use permitted under the Master Plan
1.	Upto 2000 square metres. (including the first 2000 square metres of the larger plot)	--	100% to be developed by the owner in accordance with the zoning regulations of the Master Plan.
2.	02. to 5 ha.	57	43
3.	5 ha. to 10 ha.	65	35
4.	Over 10 ha.	68	32

On the percentage of land as shown in Column 4 the owners at S. No. 2, 3 and 4 shall be entitled to one and half time of the permissible FAR under the Master Plan.

v) The shifting industries on their relocation in the new industrial estates shall be given incentives in terms of the provisions of the Master Plan and also the incentives which are normally extended to new industries in new industrial estates.

Besides this the Court also issued directives for the entitlement of the rights and benefits (payment of compensation, gratuity etc.) for the workmen employed in these industries.

As regards non-conforming industries on 12.09.2000, the Court appointed the Ministry of Urban Development to act as a Nodal Agency and directed the Ministry to create a Cell to see to the implementation of various orders passed by this court as well as the implementation of the Master Plan. The Ministry of Urban Development and Poverty Alleviation, as per directions of the Court, created a Cell on 19.09.2000. The Nodal Agency in the process had issued various directions from time to time.

In its judgement dated 07.05.2004, the Hon'ble Supreme Court issued following directions:

1. All the Industrial Units that have come up in Residential/non-confirming areas in Delhi on or after 1st August 1990 shall close down and stop operating as per following schedule:
 - a) Industrial Units pertaining to extensive industries ('F' category) within a period of four months.
 - b) Industrial Units pertaining to light and service industries (category 'B' to 'F') within five months.
 - c) Impermissible household industries (category 'A') within six months.
 - d) 6,000 industrial units on waiting list for allotment of industrial plots within 18 months.
2. The Central Government to finalize the list of permissible household industries falling in category 'A' within a period of three months.
3. 6,000 industrial units on waiting list shall be allotted industrial plots within one year.
4. The Delhi Government may announce a policy within six weeks giving such incentives as it may deem fit and proper to those industrial units which came to be established after 1st August 1990 and may close down on their own before the expiry of the time fixed in this order. The non-announcement of incentives by the Government shall not, however, delay the closure process.
5. The water and electricity connection of the industrial units found operating after due date of closure shall be disconnected forthwith and in any case not later than a month of the date fixed for closure in Direction No. 1 above. If the industrial activity still continues, the premises shall be sealed within a period of not later than another one month.
6. The Central Government to finalise within six months appropriate steps to be taken for making NCR a success for industrial activity by removing the hurdles pointed out by the industry. The Governments of the adjoining States Haryana, Rajasthan and Uttar Pradesh to extend full cooperation.
7. The Municipal Corporation of Delhi shall consider within three months the aspect of withdrawal of exemption notification as suggested in the affidavit of its Town Planner filed on 28th October 2002.
8. The Honourable Court appointed a Monitoring Committee comprising (i) Chief Secretary of Delhi, (ii) Commissioner of Police (Delhi) (iii) Commissioner (Municipal Corporation of Delhi) and (iv) Vice-Chairman (Delhi Development Authority). This Committee would be responsible for stoppage of illegal industrial activity. It would, however, be open to the aforesaid members of the Monitoring Committee to appoint responsible officers subordinate to them to oversee and ensure compliance of the directions contained in the judgement.
9. The first Progress Report by the Committee shall be filed by 31st August 2004 and thereafter it shall be filed at least once in a period of every two months.

5.9 FISCAL POLICY

5.9.1 Issues

One of the main problems confronting the development of NCR is the existing tax structure. The lack of uniformity in tax rates for various commodities and services and incentives like tax holidays etc. in the constituent States has been causing diversion of trade and manufacturing activity from one state to another. It has been strongly argued at various forums that whereas there is a reasonable amount of uniformity in tax among the States, the effective rates of tax is substantially lower in Delhi than in the neighbouring States. It is being argued that these differentials in tax rates, with the added advantage of availability of better social and physical infrastructure and with lower tariff in Delhi, have helped the process of concentration of industry, trade and services etc. in Delhi in the past.

5.9.2 Tax Reforms

A major thrust in this direction has come from the recommendations of the Conference of the Chief Ministers and Finance Ministers held on 16th November 1999 wherein a decision for adoption of minimum floor level of taxes at the national level, for all the States, was taken. Regarding floor rates, there was a broad category of absolute necessities, which were tax exempt; essential commodities with a floor rate of four per cent and luxury items with a floor rate of 12%. Commodities falling in general category were put under a floor rate of eight per cent. There were two special floor rates of one per cent for gold and silver bullion and 20% for liquor and tobacco etc. The rates recommended relate to minimum floor rates-the States have the freedom to adopt higher rates on any of the commodities from the list but they cannot go below these rates. Most States, including the participating States of NCR viz., NCT-Delhi, Haryana, Rajasthan and Uttar Pradesh, have implemented the decision to adopt minimum floor rates. The Conference also unanimously resolved that the offer of grant of any new incentive based on sales tax for industries shall be discontinued.

The introduction of State level VAT by Government of India in the budget 2005-2006 is likely to go a long way in achieving uniformity in NCR.



TRANSPORT

6.1 BACKGROUND

The Regional Plan-2001 for NCR notified in January 1989 formulated a set of policies for the control of land uses and development of infrastructure in the region. The Functional Plan on Transport prepared and approved by the NCR Planning Board in 1995 envisaged an organized transport network to improve accessibility and the movement of goods and passengers within the region. The Functional Plan on Transport suggested construction of road and rail linkages along the high-density routes, in and around the Capital and also in the National Capital Region.

6.2 EXISTING CHARACTERISTICS

6.2.1 Transport Network

The transport system of NCR as of today consists of well-knit road network and radial rail corridors catering to inter-city and intra-city commuters and long-distance traffic. The freight traffic is also substantial in the region and this is mostly carried by road. Delhi acts as collection and distribution centre for the northern region.

i) Road Network

Existing road network in the region shows convergence of five national highways i.e., NH-1, 2, 8,10 and 24 on Delhi and two National Highways namely NH58 and NH91 meet NH24 at Ghaziabad [Map 6.1 National Capital Region: Existing Transport Network (Roads) 2002]. These national highways have four lane divided carriageway on most of the stretches of NCR. The Delhi-Rohtak (NH10), from Delhi to Delhi-Haryana border is four to six lane divided carriageway, Ghaziabad-Meerut (NH58) is four lane divided carriageway up to Meerut excluding Meerut bypass, which is two lane, and Ghaziabad-Bulandshahar (NH91) which is two lane highway. In addition to this, NH71, NH71A and NH71B also pass through the region.

Ten state highways also serve in strengthening the regional road network. Most of the state highways are of single lane or intermediate lane.

ii) Rail Network

The NCR rail network covers three zonal railways (northern, western and central) zones and five divisions. The rail network in the region consists of both broad and metre gauges. Five broad gauge railway lines converge at Delhi [Map 6.2 National Capital Region: Existing Transport Network (Rail) 2002].

The rail network has two specially identified lines known as the Goods Avoiding lines (GAL) and Delhi Avoiding Lines (DAL). The GAL provides a direct entry from Ghaziabad to New Delhi bypassing the

NATIONAL CAPITAL REGION EXISTING TRANSPORT NETWORK (ROADS) 2002



Legend

- NCR Boundary
- State Boundary
- District Boundary
- Settlement
- National Highway
- State Highway
- Other Roads

10 5 0 10 20 30 40 50 Km



**NATIONAL CAPITAL REGION PLANNING BOARD
MAP 6.1**

congested Delhi Railway Station Complex. The DAL provides a direct passage from the major yards-Tughlakabad and Ghaziabad directly into the Delhi-Ambala-Kalka section and through Lajpat Nagar, Patel Nagar, Daya Basti and Azadpur link.

iii) Airport

At present two airports are located at Delhi-Indira Gandhi Airport is for international flights and Palam Airport for domestic flights.

6.2.2 Traffic Volume (2001)

i) Traffic Counts

On the boundary of NCT-Delhi, the highest traffic volume is at NH24 (Delhi-Ghaziabad) followed by NH8 (Delhi-Gurgaon) (refer Annexure 6/Ia). The lowest traffic volume is at SH57 (Delhi-Loni). The maximum traffic volume crossing-over on river Yamuna is at ITO bridge followed by Nizamuddin bridge while the lowest is at Okhla barrage bridge (The figures are for February 1999 when improvements at the ITO and Nizamuddin bridges had been completed but the Delhi-Noida Toll bridge had not been opened).

ii) Directional Flow

The directional split of passenger trips by purpose as given in Annexure 6/Ib clearly demonstrates that people are commuting to Delhi for work in the morning and returning in evening. The commuter behaviour is extremely pronounced at the Nizamuddin bridge where nearly 80% of the traffic in the morning is towards NCT-Delhi. In the evening peak hour, ITO bridge shows the highest directional split in favour of movement from NCT-Delhi (approximately 75%).

6.2.3 Pattern of Movement

The destination of the vehicles surveyed at the outer cordon of NCT-Delhi is given in the following table:

Table 6.1: Vehicle Destination at Outer Cordon of NCT-Delhi

Location	NCT-Delhi	Haryana	Uttar Pradesh	Others
1	2	3	4	5
% of vehicles	16	71	08	05

Source: JICA Study Team

The figures also take care of the double counting factor i.e., to account for a vehicle passing through more than one Origin Destination (OD) interview site.

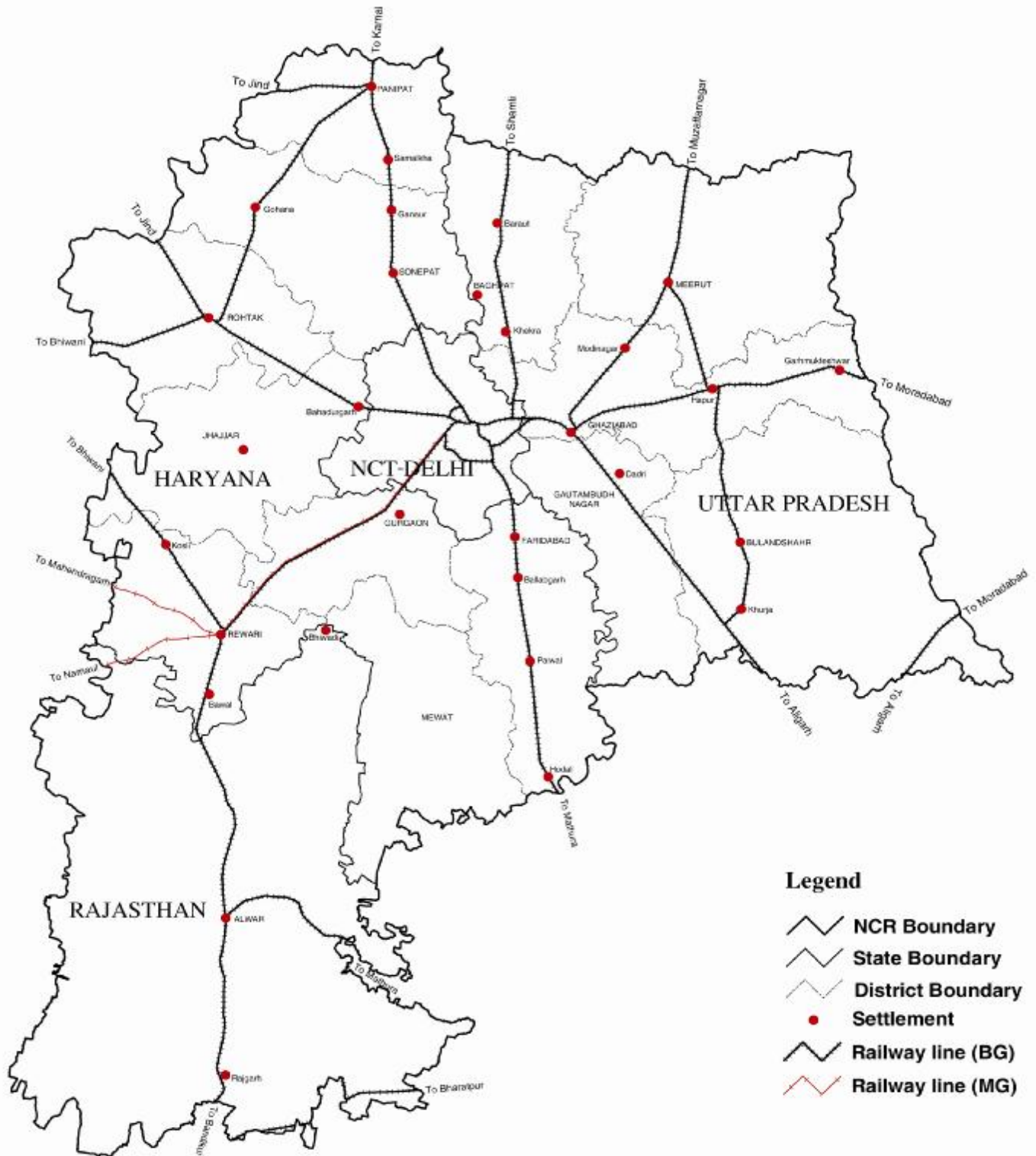
The OD characteristics indicate that out of a total of 34.21 lakhs trips, about 78.5% are carried out within NCR with overall internal-external trips (NCT-Delhi to NCR) as 36.67% and external-internal trips (NCR to Delhi) as 41.86%. External-external trips (outside NCT-Delhi) are 21.27% of the total trips. Details of daily passenger trips, which have been calculated from the traffic volume and vehicle occupancies of respective modes are presented in the Annexure 6/IIa.

The Origin-Destination characteristics by mode indicate that public transport commands a total share of 71.54% whereas private mode constitutes 28.46%. Details of Trip Characteristics by Mode are tabulated in the Annexure 6/IIb.

6.3 OBJECTIVES OF TRANSPORT PLAN

The objective of the Transport Plan is to promote and support the economic development of the region and relieve the Capital of excessive pressure on the infrastructure including traffic congestion. It is to

NATIONAL CAPITAL REGION EXISTING TRANSPORT NETWORK (RAIL) 2002



Legend

- NCR Boundary
- State Boundary
- District Boundary
- Settlement
- Railway line (BG)
- Railway line (MG)



**NATIONAL CAPITAL REGION PLANNING BOARD
MAP 6.2**

Note:
Meter Gauge being converted to Broad Gauge.
Source: NPSA Study

provide accessibility to all the parts of the region and discourage the transit of passengers and goods through the core area of NCT-Delhi by providing bypasses and thereby opening areas for economic development of the rest of the region.

6.4 TRANSPORTATION DEMAND FORECASTING

The data for transport sector has been collected and collated from various existing studies. Transport demand forecast for the year 2005, 2011 and 2025 for Delhi Urban Area is given in Annexure 6/IIIa. The total intra-city trips within NCT-Delhi, are projected to increase from 160.4 lakhs in 2005 to 260.6 lakhs in 2025. The modal split in favour of public transport system is proposed to increase to 82% due to the introduction of Mass Rapid Transit System (MRTS) for Delhi. Thus, total Public Transport system trips are projected to increase from 131.5 lakhs trips per day in 2005 to 213.7 lakhs trips per day in the year 2025.

Transport demand forecast for the year 2005, 2011 and 2025 for Delhi and NCR is given in Annexure 6/IIIb. It is projected that by the year 2025 more than 80 lakhs trips will be performed from Delhi to NCR. Around 40% trips will be carried by rail and bus modes each and remaining 20% will be carried by other private modes.

6.5 POLICIES AND STRATEGIES

Based on the observations and findings in the analysis as above, the following policy actions are to be provided to achieve the overall objectives of the Regional Plan-2021:

- (a) To decongest NCT-Delhi roads, rail and rail terminals by diverting the bypassable traffic from Delhi.
- (b) To provide linkages amongst Metro/Regional Urban Settlements in the outlying areas of NCR.
- (c) To connect Metro/Regional Centres with the Capital by an efficient and effective transport network for facilitating faster movement of traffic among such centres and NCT-Delhi.
- (d) To link the Sub-regional Centres with effective and efficient transport network for facilitating the faster movement of traffic among such centers and higher order settlements.
- (e) To directly link other urban nodes having maximum attracting and generating characteristics.
- (f) To create the Unified Metropolitan Transport Authority for NCR.

6.6 TRANSPORT PLAN 2021

It is recognised and reaffirmed that the solution of the increasing transportation problem lies in development of settlements outside the NCT-Delhi metropolis at appropriate distance and providing inter-connection between Delhi and settlements thus reducing pressure on Delhi's transport infrastructure. Accordingly it is proposed to:

- Develop activities keeping in view rail and road linkages in Central NCR having better accessibility and at the same time relieving pressure on the existing transport routes converging at NCT-Delhi.
- Unrestricted movement of buses, taxis, and auto-rickshaws within NCR.

- Focus on certain inter-state issues (e.g. land acquisition) for workable coordination and evolve an institutional mechanism on priority basis to encourage private participation.
- Execution without further delays of the Regional Plan-2001 proposals of Integrated Mass Rapid Transport System (MRTS), Regional Rapid Transport System (RRTS), Expressways and Bypasses.

6.6.1 Road Network

It is proposed to develop following hierarchical road network in order to encourage, guide and sustain the envisaged development in the region and to cater to higher traffic interaction among NCT-Delhi and Regional towns:

- i) Primary Road Network
- ii) Secondary Road Network
- iii) Tertiary Road Network

i) Primary Road Network

- a) Primary roads are radial roads connecting Regional/Priority Towns with NCT-Delhi. Seven radial roads have already been declared as National Highways [refer Map 6.3 National Capital Region: Proposed Transport Network (Roads) 2021]. Out of the seven national highways NH1 (Delhi to Panipat), NH2 (Delhi to Palwal) and NH8 (Delhi to Behror) are already having four lane divided carriageway, whereas NH10 (Delhi to Rohtak) and NH24 (Delhi to Hapur) are partially four lane. Besides, NH71 (Rewari to Rohtak), NH71A (Rohtak to Panipat), NH71B (Rewari-Sohna-Palwal), NH58 (Ghaziabad-Meerut-Muzaffarnagar) and NH91 (Ghaziabad-Khurja-Aligarh) needs upgradation. It is proposed to develop the existing ring road, outer ring road and the five radial roads (national highways) upto CNCR towns (i.e., NH1 Delhi to Kundli, NH2 Delhi to Ballabhgarh, NH8 Delhi to Gurgaon, NH10 Delhi to Bahadurgarh and NH24 Delhi to Ghaziabad) to expressways standards. It may be necessary in some places that a complete elevated expressway is required if no land is available for upgradation. Inter-state junctions and approaches to Delhi should be improved to remove the bottlenecks.
- b) It is further proposed that Loni-Baghpat-Shamli State Highway Corridor be upgraded to that of four lane divided carriageway. Existing road connecting Jhajjar with Delhi via Badli is to be upgraded. All these be upgraded from time to time through widening techniques for capacity augmentation to cater the future traffic in an efficient manner. They may be developed at NH standard by 2021.
- c) Alwar, a Regional Centre in Rajasthan should be connected to Delhi or Gurgaon through upgraded radial corridor.
- d) Grid Roads: These consists strengthening and widening of existing alignments along the following stretches:
 - Sonapat-Bahalgarh-Baghpat-Meerut
 - Meerut-Hapur-Bulandshahr-Khurja-Palwal
 - Palwal-Sohana-Rewari
 - Rewari-Jhajjar-Rohtak-Sonapat
 - Rohtak-Gohana-Panipat
- e) Peripheral Expressways: All the CNCR towns should be connected with each other through Peripheral Expressway consisting of Kundli-Manesar-Palwal (KMP) Western Peripheral

- e) Expressway and Kundli-Ghaziabad-Palwal (KGP) Eastern Peripheral Expressway (Faridabad-Noida-Ghaziabad Corridor and Ghaziabad-Kundli Corridor). These are to be implemented on priority in the first phase. The Expressway between Ghaziabad to Meerut, for which the feasibility study has been carried out, is to be taken up in the subsequent phase.
- f) Access to above expressways is to be provided through interchanges with major arterial roads from NCT-Delhi. Major arterial roads should also have partial access control within NCT-Delhi. These arterials will act as feeder roads to expressways from major district centres and employment/business centre etc. in NCT-Delhi. All the arterial roads connecting NCT-Delhi with CNCR towns should be strengthened to improve the connectivity with NCT-Delhi.
- g) Sub-arterial roads emerging from arterial roads will provide access to small business, employment centres, residential areas etc. and arterial roads will provide access to expressway through major arterial roads.
- h) *Perimeter/Ring Roads*: All the Metro and Regional Centres to be connected with perimeter roads of expressway standard to act as bypass for through traffic. An appropriate hierarchical road system for the regional towns to cater to the intra-urban traffic in an efficient manner is proposed to be developed for all the priority towns.

ii) Secondary Road Network

Secondary road network consists of Major District Roads connecting smaller towns with the priority towns of the region and with the primary road network of the region. Priority has to be established through Sub-regional Plans and all the towns in the Sub-region have to be connected with regional towns and with the primary road network by 2021. These roads are proposed to be two/intermediate/single lane depending upon the envisaged traffic and interaction with the adjoining areas. Roads connecting expressways with international airport should be upgraded. Action Plan for their upgradation is to be prioritised in the Sub-regional Plan.

iii) Tertiary Road Network

All the villages, work places, small business, employment centres, residential areas and agriculture/forest areas are to be provided access through tertiary road network. It will consist of a single/intermediate/double lane metalled roads connecting to Sub-regional towns and secondary road system of the region for efficient movement of traffic and to boost balanced development in the region.

6.6.2 Rail Network

Development of road network alone will not be able to meet the transport demand in NCR. Hence, a supportive rail network will have to be developed for meeting the gap in demand and supply. The system of these networks needs to act in an integrated manner as shown in Map 6.4 National Capital Region: Proposed Transport Network (Rail) 2021.


i) Regional Rapid Transit System

Primary regional rail network should connect the regional towns among each other and with Delhi, through dedicated lines to meet the demand on specific corridors as identified in the Report "Identification of Rail Projects for Commuter Travel in NCR and Delhi " prepared by RITES in 1999 should be developed as Regional Rapid Transit System (RRTS). These corridors are specified in Annexure 6/IV.

NATIONAL CAPITAL REGION PROPOSED TRANSPORT NETWORK (ROADS) 2021



NOTE: The Alignment of Expressways are tentative.
Source: NIRSA Study



NATIONAL CAPITAL REGION PLANNING BOARD
MAP 6.3

ii) Regional Rail Network

Rail network is required to be extended to the Sub-regional centres so as to act as feeder system to RRT System and accelerate development process in the region. In this connection, it is proposed that rail link between Rewari to Bhiwadi be taken on priority. The rail link between Rohtak to Hansi may also be taken up to facilitate the movement between Delhi and Hissar (a Counter-magnet town). The rail link between Rewari and Rohtak via Jhajjar may also be taken up on priority.

iii) Orbital Rail Corridor

Orbital rail corridor connecting radial rail corridor of Indian Railway at CNCR towns and directional terminals to bypass the regional traffic around Delhi is proposed. This will be parallel to the proposed peripheral expressways.

iv) MRTS for Delhi and CNCR Towns

MRT system be extended to CNCR towns and integrated with upgraded ring railway in Delhi and integrated with the proposed RRTS. It is proposed that the MRTS and RRTS are to be planned with appropriate integrated feeder rail/road services.

6.6.3 Intra-city Urban Transport

In order to cater to increasing demand of intra-urban traffic in towns, mass transport system for commuters such as Light Rail Transit System (LRTS), High Speed Tram System (HSTS), High Capacity Bus system (HCBS), Metro Rail, Trolley Buses, Sky Tram System or any other such system, wherever is feasible, with a provision for feeder system should be provided in the towns having population more than five lakhs.

6.6.4 Airways

With the growing air traffic, it is suggested to develop an international airport at a suitable location within the region to act as an alternative to the existing international airport in Delhi. In addition, it is also suggested to develop domestic air terminals within the region.

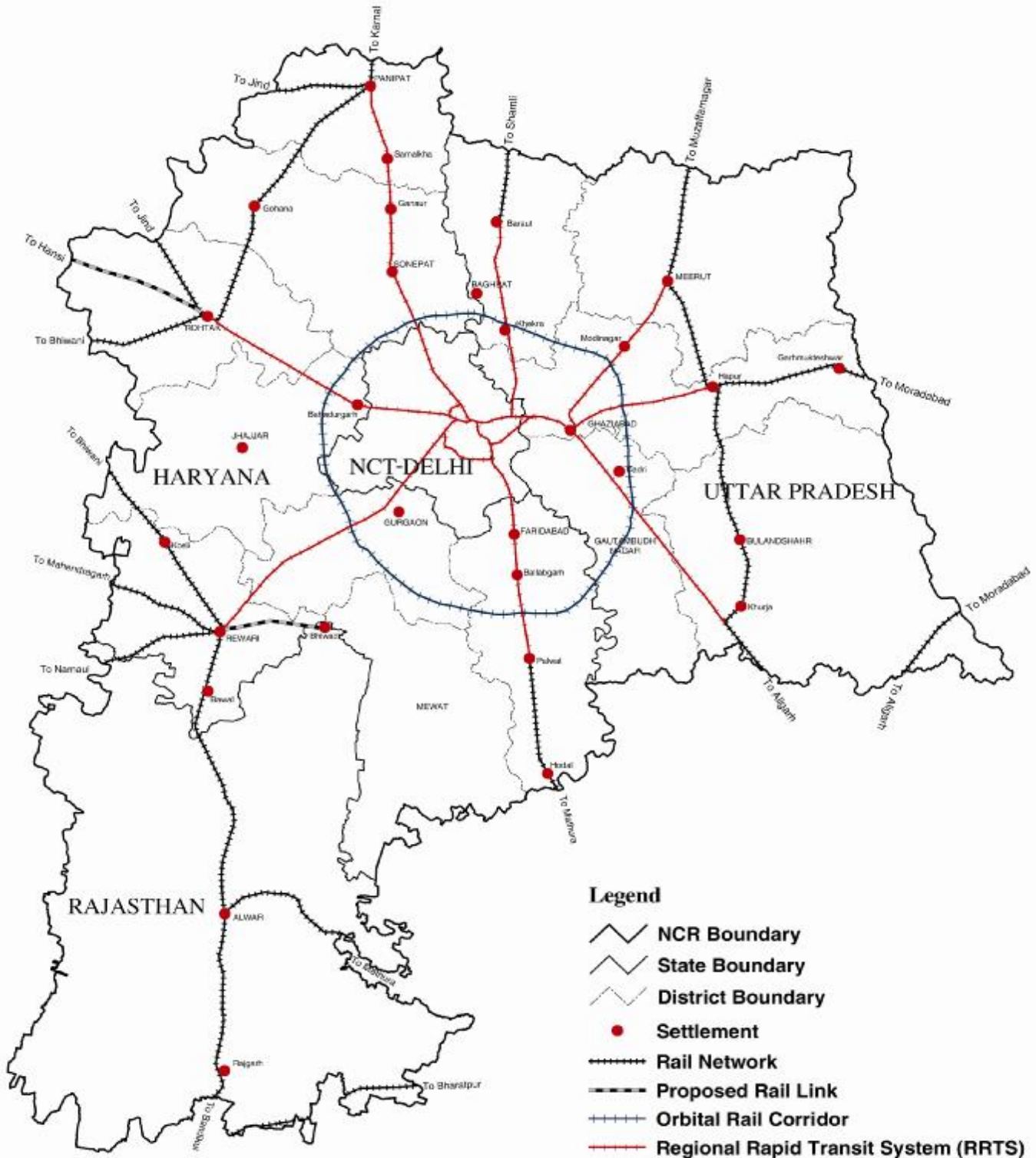
6.6.5 Action Plan

The problem of Regional Transport in NCR area is of a varied nature. At present, various transport authorities/agencies are responsible for planning, development and management of the transport facilities and services. They operate, in large parts of this region independent of each other. This results in avoidable long travel time and more expenditure. The responsibilities for providing transport facilities and enforcement of rules and regulations are often fragmented and vague. The agencies charged with such responsibilities need to be strengthened and a coordinating agency needs to be constituted with representatives from various transport authorities, which would coordinate and take an overall and integrated view of the total transportation system in the region. This agency will be for the entire region, having a long-term goal of planning and development of a coordinated network of transport services.

An authority for the region could, therefore, be set up either through fresh legislation under Clause (i) of Article 252 of the Constitution with the consent of the participating States or through a Resolution of the Board itself, which obviously would be of a non-statutory nature.


Policy and Planning Group: A Policy and Planning Group (PPG) should be established to function specifically at the State level to plan and coordinate with agencies at the State level. This group should also take into consideration the policies for overall spatial planning for the region. This group should also

NATIONAL CAPITAL REGION PROPOSED TRANSPORT NETWORK (RAIL) 2021



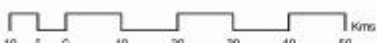
Note:
 1. Alignment of Proposed Orbital Corridor and Proposed Rail links are tentative.
 2. Meter Gauge being converted to Broad Gauge.

Source: NRSA Study



NATIONAL CAPITAL REGION PLANNING BOARD

MAP 6.4



ensure community participation. To be more effective this group should be chaired by the Transport Minister of the State. The main functions of this group would be:

- To spell out goals and formulate policy guidelines to facilitate preparation of a Strategic Transport Plan (STP) for the State and a multi-modal plan for linkages with NCR.
- To coordinate activities of various groups/agencies at the plan formulation stage.
- To regulate allocation of funds to different agencies for coordinated development.
- To ensure provision of land with focus on identification, reservation and protection for development of transport related projects.

Traffic Management Group: The Traffic Management Group (TMG) will prepare traffic management strategic action plans with emphasis on movement of people and goods. Area level traffic management schemes with active participation from peoples' group should be prepared for implementation according to time bound programmes.

Enforcement Group: The proposed Enforcement Group (EG) will have professional advisors, concerned officers from local bodies in addition to the traffic police and local residents and will evolve strategic action plans to ensure smooth and safe flow of all modes of traffic.

6.7 PHASING OF PROJECTS

The Plan is divided in two phases i.e., Ist Phase 2001-2011 and IInd Phase 2011-2021. In the first phase of the Plan, following projects would be taken up for implementation:

- a) Western Peripheral Expressway
- b) Eastern Peripheral Expressway
- c) Rapid Rail Transit System
 - § Shahdara-Ghaziabad
 - § Sahibabad-Minto Bridge
 - § Dayabasti-Gurgaon
 - § Naya Azadpur-Narela-Sonepat
 - § Patel Nagar-Nangloi-Bahadurgarh
 - § New Tilak Bridge-Tughlakabad-Ballabhgarh
 - § New Tilak Bridge-Noida-Greater Noida
- d) Present ring road, outer ring road, and five national highways (radial roads) up to CNCR towns to be developed as per expressway standards.
- e) Four laning of the following road sections
 - § Bahadurgarh-Rohtak-NCR Border (NH10)
 - § Rohtak-NCR Border (NH71)
 - § Ghaziabad-Meerut-NCR Boundary (NH58)
 - § Ghaziabad-Bulandshahr-Khurja-NCR Boundary (NH91)
 - § Gurgaon-Alwar (Old NH8)
 - § Panipat-Gohana-Rohtak
 - § Jhajjar-Rewari Road (NH71 and NH71A)
 - § Elevated Road connecting Delhi with Faridabad near Badarpur
 - § All other roads connecting CNCR towns with Delhi

- f) Rewari-Bhiwadi Rail Link
- g) Rohtak-Hansi Corridor

In the second phase of the plan, following projects would be taken up for implementation:

- a) Ghaziabad-Meerut Expressway
- b) Rapid Rail Transit System
 - § Ghaziabad-Meerut
 - § Ghaziabad-Hapur
 - § Ghaziabad-Khurja
 - § Shahdara-Shamli
 - § Sonapat-Panipat
 - § Gurgaon-Rewari
 - § Brar Square-Delhi Cantonment
 - § Ballabhgarh-Palwal
- c) Orbital Rail Corridor
 - § Ghaziabad-Noida-Faridabad-Gurgaon-Bahadurgarh-Kundli-Ghaziabad
- d) Upgradation of Grid Roads
 - § Bhiwadi-Rewari
 - § Rohtak-Sonapat
 - § Sonapat-Baghpat
 - § Baghpat-Meerut
 - § Meerut-Hapur
 - § Hapur-Bulandshahar
 - § Bulandshahar-Khurja
 - § Khurja-Palwal
 - § Palwal-Bhiwadi

6.8 INVESTMENT REQUIREMENT

The total investment requirements for the implementation of the Ist Phase of Plan proposals would be Rs.19,141 crores at the 2001 prices.



POWER

7.1 POWER

Power is an important aspect of the physical infrastructure that requires planning in advance, development and management for improved quality of life, productivity and economic activities.

The status of power supply in the National Capital Region has not kept pace with the increasing population and the growth of economic activities such as industries, trade, commerce, offices etc. There is an overall shortage of power in the Northern Grid, from where the region draws its power and hence, power cuts have become a routine affair, disturbing daily life as well as affecting economic productivity. The situation is even worse in the rural areas where the quantity and quality of power supply is very poor. Although augmentation of generating capacities of power and improvement in transmission and distribution system is a gigantic task requiring substantial resources, yet it is essentially required to be taken up for the balanced and harmonized development of the region.

It was proposed in the Regional Plan-2001 for an uninterrupted supply of power in adequate quantity and quality and priority in making additional power available to NCR. As part of the Functional Plan in NCR, various strategies were suggested for adequate supply of power for various industrial, economic and business activities in the Priority Towns, which may be at least at par, if not better than Delhi Metropolis.

In the review of Regional Plan-2001, it was observed that one of the major constraints in the process of planned development and growth of economic activities in the National Capital Region was inadequate availability of electric power. The power supply deficit within the NCR States at the end of the 8th Plan (1996-1997) was 31.1% in NCT-Delhi, 50% in Haryana, 49.6% in Rajasthan and 37.7% in U.P.

7.2 EXISTING SITUATION AND ISSUES

7.2.1 Existing Availability and Future Demand

District wise data collected from the region for the last three years with regard to energy received and peak demand is given in Table 7.1. Based on the existing data and considering future development programmes in the region, the Sub-region wise energy requirements and peak loads for the entire NCR have been worked out in Table 7.2.

Projections made by Central Electricity Authority (CEA) have revealed the requirement of huge additional generation of power for the region. Table 7.3 reveals that additional capacity required by the year 2006-2007 is 4,513 MW and by the end of year 2020-2021 it will be 23,345 MW. The total additional installed capacity requirements by the year 2020-2021 is expected to be 4,862 MW in Haryana Sub-region, 1,690 MW in Rajasthan Sub-region, 9,195 MW in UP Sub-region and about 7,597 MW in NCT-Delhi Sub-region. These projections have been worked out by assuming that there will be an

addition in the power generation capacity of 2,764 MW from the year 2002 to 2007 and 2,922 MW from the year 2007 to 2012.

Table 7.1: Sub-region wise Energy Received and Peak Load for NCR

Sub-region/ Region	Energy Received (Mkwh)			Peak Load (MW)		
	1988-1999	1990-2000	2000-2001	1998-1999	1999-2000	2000-2001
ACTUALS						
1	2	3	4	5	6	7
NCT-Delhi	16,257	17,452	18,432	2,484	2,930	3,094
Haryana	6,153	6,609	6,983	1,154	1,103	1,143
Rajasthan	1,199	1,221	1,072	365	361	326
Uttar Pradesh	5,462	5,353	5,323	1,406	1,480	1,595
Total NCR	29,071	30,635	31,810	5,410	5,874	6,158

Source: Central Electricity Authority

Table 7.2: Sub-region wise Energy Requirement and Peak Load in NCR

Sub-region/ Region	2000-2001 (Actual)	2001-2002	2006-2007	2011-2012	2016-2017	2020-2021
1	2	3	4	5	6	7
NCT-Delhi						
Energy Requirement (MU)	18,432	19,454	25,672	34,762	46,849	59,258
Growth Rate (%)	--	5.54	5.70	6.25	6.15	6.05
Load Factor (%)	68.00	68.00	68.00	68.00	68.00	68.00
Peak Load (MW)	3,094	3,266	4,310	5,836	7,865	9,948
Haryana						
Energy Requirement (MU)	6,983	7,579	11,002	16,735	25,338	35,179.2
Growth Rate (%)	--	8.54	7.74	8.75	8.65	8.55
Load Factor (%)	69.76	70.00	70.00	70.00	70.00	70.00
Peak Load (MW)	1,143	1,236	1,794	2,729	4,132	5,737
Rajasthan						
Energy Requirement (MU)	1,072	1,265	1,738	2,554	3,735	5,043.72
Growth Rate (%)	--	18.00	6.56	8.00	7.90	7.80
Load Factor (%)	37.54	40.00	42.50	43.00	44.00	45.00
Peak Load (MW)	326	361	467	678	969	1,279
Uttar Pradesh						
Energy Requirement (MU)	5,323	5,837	8,456	13,011	19,927	27,922
Growth Rate (%)	--	9.66	7.69	9.00	8.90	8.80
Load Factor (%)	38.09	39.02	41.76	42.80	43.80	44.60
Peak Load (MW)	1,595	1,707	2,312	3,470	5,193	7,147
Total NCR						
Energy Requirement (MU)	31,810	34,135	46,868	67,062	95,849	127,403
Growth Rate (%)	--	7.31	6.61	7.43	7.40	7.37
Load Factor (%)	58.97	59.31	60.23	60.22	60.25	60.32
Peak Load (MW)	6,158	6,570	8,883	12,713	18,159	24,111

Source: Central Electricity Authority

According to CEA, there are no plans for additional capacity generation beyond 2012. In fact, this capacity addition also includes allocation from the central sector projects that are proposed to be commissioned by the end of 10th and 11th Plans. An important point to consider is that the average energy consumption pattern in the concerned Sub-regions during the period 1998 to 2001 was 42.80% of the total consumption in Haryana State, 5.00% of the total consumption in Rajasthan State and 15.00% in case of the State of Uttar Pradesh. In view of this, the distribution of allocations from central sector projects to respective Sub-regions has been made in the similar proportions.

This would not only entail huge investment but also need meticulous planning and implementation of power development programmes in the region.

This projection of demand for power does not include the load requirements for MRTS and RRTS. Since these services require adequate and uninterrupted power supply, it is assumed that this aspect will be adequately ensured and planned by the relevant authorities while formulating the MRTS and RRTS Projects.

7.2.2 NCR as Non-Priority Area

At present, the power supply to various States/Sub-regions of the NCR is regulated through the Regional Grid system. The power supply system of the NCR States namely Haryana, Rajasthan, Uttar Pradesh and NCT-Delhi forms part of the Northern Grid. The Northern Grid, which is overseen by the Northern Regional Electricity Board (NREB), gets power through various Central and State generating stations and in turn supplies power to the constituent States. Although the overall control and monitoring of the Northern Regional Grid operation is done by the NREB, the basic management and control of the power supply system in the States is done by the State Governments through their respective Power Authorities/Corporations. Power Authority/Corporations of the constituent States are not giving any priority to NCR in the matter of supply of electricity. There is no separate power station or Sub-grid primarily for NCR in the Northern Grid system and there is huge demand-supply gap which needs to be narrowed down to attain the requisite level of regional economic development.

7.2.3 Lack of Inter-Agency Coordination

Basic management and control of the power supply system in the constituent States was through their respective Electricity Boards, which is now being done by different companies/corporations in different areas due to unbundling of the Electricity Boards. These agencies will have to coordinate with NTPC, NHPC, CEA, NREB etc. Earlier, even the Electricity Boards were having poor coordination, and now with more of these agencies created by their disintegration, the problems are likely to multiply.

7.2.4 Transmission and Distribution Losses

The transmission and distribution losses in all the Sub-regions are enormous and are mainly due to following reasons:

- Fraudulent extraction of energy from metered supply by the customers including industrial and commercial establishments.
- Drawing electricity without legal connection in the electrified colonies.
- Illegal direct tapping from the mains by the residents of JJ clusters and unauthorized colonies.
- Misuse and thefts by industries and commercial establishments in non-conforming areas and un-metered supply.
- Drawing load in excess of the sanctioned limit or tampering with meters.
- Technical losses, due to inadequate distribution systems.

7.2.5 Lack of Load Management

No efforts are being made by the Distributing Agencies to reduce the peak demand to manageable limits vis-à-vis availability of power in the Grid, by adopting modern techniques, which can flatten the load curve.

7.2.6 NCR as Sub-Grid of Northern Grid

Emphasis has to be given to have a Sub-grid for NCR in the Northern Grid, for better management of the load in the region. This, along with the provision for Supervisory Control and Data Acquisition System (SCADA), was proposed in the Functional Plan on Power as well as during the review as this could have resulted in better management of power supply in the region.

7.2.7 Other Issues

Other issues that are hampering effective management of generation, transmission and distribution of the power supply in the region include:

- Lack of commercial approach by the electricity departments.
- Environmental pollution caused due to disposal of slurry/fly-ash on riverbank and other disposal sites, air/noise pollution in and around thermal power plants.
- Lack of safety measures being adopted by electricity departments.
- Lack of enthusiasm towards the promotion of non-conventional energy sources in the region.

7.3 POLICIES AND PROPOSALS

In order to improve the overall power situation in the National Capital Region for the perspective year 2021 for the harmonized and balanced development of the region, following strategies and policies have been proposed:

7.3.1 Future Demand and Augmentation of Power

CEA has projected the total power requirement for the region to be 34,444 MW by the year 2020-2021 (refer Table 7.3).

Table 7.3: Additional Generating Capacity Required (in MW)

Sub-region/ Region	IC at the beginning of Plan	Capacity Addition including CS Share of Plan	Total IC at the end of the Plan (2+3)	IC Required	Additional Capacity Required (5-4)
1	2	3	4	5	6
NCT-Delhi					
2002-2007	3,098	1,614	4,712	6,157	1,445
2007-2012	4,712	1,902	6,614	8,337	1,723
2012-2017	6,614	Not available	6,614	11,236	4,622
2017-2021	6,614	Not available	6,614	14,211	7,597
Haryana					
2002-2007	1,815	819	2,634	2,563	(-) 71
2007-2012	2,634	700	3,334	3,899	565
2012-2017	3,334	Not available	3,334	5,903	2,569
2017-2021	3,334	Not available	3,334	8,196	4,862
Rajasthan					
2002-2007	42	44	86	667	581
2007-2012	86	51	137	969	832
2012-2017	137	Not available	137	1,384	1,247
2017-2021	137	Not available	137	1,827	1,690
Uttar Pradesh					
2002-2007	459	287	746	3,303	2,557
2007-2012	746	269	1,015	4,956	3,941
2012-2017	1,015	Not available	1,015	7,418	6,403
2017-2021	1,015	Not available	1,015	10,210	9,195
Total NCR					
2002-2007	5,414	2,764	8,177	12,690	4,513
2007-2012	8,177	2,922	11,099	18,161	7,062
2012-2017	11,099	Not available	11,099	25,941	14,842
2017-2021	11,099	Not available	11,099	34,444	23,345

Note: IC: Installed Capacity CS: Central Sector IC required= peak load requirement/0.7
Source: Central Electricity Authority, Government of India

Table 7.3 shows that the Sub-region wise power requirement by the year 2021 would be 8,196 MW for Haryana, 1,827 MW for Rajasthan, 10,210 MW for Uttar Pradesh and 14,211 MW for NCT-Delhi.

Further, CEA has projected 23,344 MW requirement of additional installed capacity by the year 2021 in the region. Sub-region wise projections include 4,862 MW for Haryana, 1,690 MW for Rajasthan, 9,195 MW for Uttar Pradesh and 7,597 MW for NCT-Delhi.

The projections given below have been worked out by CEA considering the actual power available at present and the power plants that are likely to be commissioned in NCR during 10th and 11th Plan periods.

In order to meet this additional demand, there is a need to have new power plants in the region and/or to have share for NCR in allocation of power expected to be generated by the newly proposed power plants under the Central sector power projects including mega-projects. Central Government/State Governments should take initiative to improve the power situation in their respective Sub-regions by establishing new power plants under the public and private sectors and for getting additional power allocation from the 15% unallocated quota of Central sector projects. Central sector power plants/mega-projects are listed in Tables 7.4 and 7.5, from where the share allocation for NCR can be made by Ministry of Power and Central Electricity Authority.

Power plants, proposed by the State Governments to improve the power generation in their respective Sub-regions, are listed in Table 7.6.

It can be seen from Table 7.6 that Haryana has planned for 1,500 MW, however, as per the Tenth Plan Document of Ministry of Power, only TDL Thermal Power Plant, Panipat, Bawana and Apollo (with a capacity of 500 MW) is targeted for completion in the Tenth Plan. Similarly for Delhi 1,200 MW has been planned but only 225.78 MW has been commissioned so far during the Tenth Plan. All other plants are still at a very nascent stage of planning.

Table 7.4: List of Power Projects during 10th Plan in the Northern Region

Plant Name	Status	Fuel Type	Sector	Capacity (MW)	
1	2	3	4	5	
Central Sector					
NHPC	Chamera II	SOG	Hydro	C	300
	Dulhasti	SOG	Hydro	C	390
	Dhauli Ganga	SOG	Hydro	C	280
	Sewa II	CEA	Hydro	C	120
	Sub-Total (NHPC)				1,090
NJPC	Nathpa Jhakri	SOG	Hydro	C	1,500
	Rampur	NEW	Hydro	C	400
	Sub-total (NJPC)				1,900
NTPC	Rihand II	SOG	Coal	C	1,000
	Unchahar III	New	Coal	C	210
	Dadri II	New	Coal	C	490
	Sub-Total (NTPC)				1,700
THDC	Tehri I	SOG	Hydro	C	1,000
	Koteshwar	SOG	Hydro	C	400
	Tehri PSS	New	PSTOR	C	1,000
	Sub-Total (THDC)				2,400
NLC	Barsingsar	New	Lignite	C	500
Total					7,590

Source: Central Electricity Authority, Government of India

Table 7.5: List of Mega-Projects proposed to be commissioned during 10th Plan and beyond

Name of Project	I/C (MW)	Benefits (MW)	
		10th Plan	Beyond 10th Plan
1	2	3	4
Kahaigaon-II	1,320	660	660
N.Karanpura	1,980	660	1,320
Barh	1,980	660	1,320
Maithon RBC	1,000	1,000	-
Teesta V	510	510	-
Sipat-I	1,980	1,980	-
Sipat-II	660	660	-
Pipavav	2,000	-	2,000
Hirma	4,320	-	4,320
Cuddalore	1,320	-	1,320
Koel Karo	710	-	710
Koldam	800	-	800
Parvati II	800	-	800
Cheyyur	1,320	-	1,320
Krishnapatnam	1,320	-	1,320
Narmada	1,000	-	1,000
Anta II&III	1,300	-	1,300
Auriya II&III	1,300	-	1,300
Kawas II&III	1,300	-	1,300
Gandhar II&III	1,300	-	1,300

Source: CEA

Table 7.6: Power Plants under the State Sector

Sub-region wise Power Plant	Capacity (MW)	Remarks
1	2	3
Haryana		
TDL Thermal Power Plant, Panipat	2x250	Unit 7 and 8 (Targeted in 10 th Plan)
Thermal Power Plant, Palwal	2x250	546 acres of land selected near village Chandhut and cleared by CEA
Thermal Power Plant, Rohtak	2x250	Site identified
Uttar Pradesh		
Captive Power Plant, Tronica City	11.45	Site identified. Project approved in March 2002 by PSMG-I, NCRPB
NCT-Delhi		
Pragati Power Plant	300	225.78 MW commissioned up to June 2003
Indraprastha Replacement Project	300	
Bawana Phase I and II	600	
Apollo Inter Generation	300	

Source: Study Group Report on Utility service infrastructure including power, water, sewerage, solid waste, drainage, irrigation etc.

There is need to plan for generating/obtaining additional power of 23,345 MW required for the region by the year 2021 and recommendations for the same are as follows:

- Allocation of power from the new Central sector/mega-projects should be made by the Ministry of Power.
- Ministry of Power should consider allocation of power from the 15% unallocated quota from the central sector projects.
- State Governments should allocate power to their Sub-region from their new state sector projects
- State Governments should ensure the allocated quota to their respective Sub-regions from the present allocation/generation of power.
- State Governments should enter Memorandum of Understanding (MOU) with the power generation companies in order to ensure requisite allocation of power to the Sub-region simultaneously and expeditiously.

- A dedicated power generation plant for the region should be provided in a phased manner in order to meet the gap if any, after obtaining power from the sources referred above.
- Efficient and clean technology based power plants should be encouraged/adopted to meet the growing power demand in order to reduce the levels of the greenhouse gases (GHG) levels.

7.3.2 Load Management

Modern techniques for Load Management must be adopted to flatten the load curve and reduce the peak demand in the system to a manageable proportion, vis-à-vis the availability in the grid, through a control room by starting ripple generators, so that breakdown of generation is minimized. This will save investment on additional generation of power for peak demand. Similarly, street lighting on national highways/state highways within NCR can have centrally controlled system through operation of ripple generator. Energy efficient housing should be promoted and the concept of 66 KV underground cable ring main system should be planned and executed in new townships to provide uninterrupted power supply.

It is also proposed that an Islanding Scheme for NCR as second level of Island after NDMC/Delhi will be prepared by CEA and the State power utilities concerned after revisiting the scheme which will be implemented by the concerned power utility companies for better load management.

7.3.3 Improvement in Transmission and Distribution

Transmission and distribution system in the region should be improved keeping in view the increased demand of power by properly designing the L.T. distribution system viz., service line and service mains by providing transformers with adequate capacities, electronic meters, LT/HT breakers conforming to IE rules & specifications and by promoting communications (automation) in power supply system.

State Governments will also carry out periodic audit for identification of technical and commercial losses which will help in improving the transmission and distribution system on a regular basis.

7.3.4 Sub-group within Northern Region Electricity Board

Sub-group within Northern Region Electricity Board should be created for NCR by the Ministry of Power to oversee the power supply and periodically discuss the power issues in NCR and make recommendations regarding quality and reliability of power supply in the region.

7.3.5 Sectoral Plans for Power

Concerned State Governments will prepare Sectoral Plans for power and incorporate/integrate them in their respective Sub-regional Plans in order to improve the quality of power supply.

7.3.6 Promotion for Non-Conventional Energy Resources

Emphasis should be given for promoting non-conventional energy resources such as solar energy plants on roof top etc. in big hotels, institutions, commercial buildings, group housing etc., to meet a part of the power demand.

7.3.7 Public-Private Partnership

Keeping in view the huge investment required, which amounts to approximately Rs. 93,380 crores for the power generation and Rs. 58,000 crores for transmission and distribution till 2021, there is need to promote public-private partnership. Commercial approach and simplified procedures for the release of new connections, upgradation of demand load etc. should be adopted by these companies.

7.3.8 Review of Policies and Strategies for Power

In view of the reforms at the national level and technological advancements that are taking place, the review of the Power Sector strategies and policies for NCR should be done at least every five years.

7.4 PLAN OF ACTION AND PHASING OF IMPLEMENTATION OF STRATEGIES/POLICIES/PROPOSALS

In order to implement the policies on Power in the region, it is imperative to have a detailed 'Plan of Action' along with phasing, so that the implementation of policies and proposals in the Regional Plan can be dovetailed with the five-year plans. Keeping this in view, each recommendation has been phased on the basis of five-year plan, where certain activities are to be completed within first five-year plan while other activities may span from second to fourth five- year Plans. Activities which need to be completed in the first five-year are: (a) formation of Sub-group within Northern Region Electricity Board by the Ministry of Power to oversee the power supply and periodically discuss the power issues in NCR and make recommendations regarding quality and reliability of power supply in the region, (b) concerned State Governments to prepare Sectoral Plans for power and incorporate/integrate the same in their respective Sub-regions and (c) to carry out audit for identification of technical and commercial losses to help in improving the transmission and distribution system, etc. Whereas the recommendations on load management, augmentation of power, promotion for non-conventional energy etc., involving long-term planning, will spread in all the plans, improvement in transmission and distribution has been recommended to be completed by the end of the 11th Plan for better management.

Phased programme and plan of action have been worked out to give effect to the proposal and implementation thereof, which is at Annexure 7/I.

7.5 INVESTMENT PLAN

Power requirement in the region would be 23,345 MW by the year 2021 and accordingly there will be need to generate this additional power and strengthen/expand the transmission and distribution lines. Total investment required for the generation of power by the year 2021 will be Rs.93,380 crores and for strengthening/expansion of transmission and distribution system, it will be Rs.58,362 crores. However, block year-wise fund requirement for the region has been given in the following table:

Table 7.7: Phase wise Fund Requirement for the Region (Rs. in Crores)

Plan Period	Additional capacity required in MW	Cost of power generation (@ Rs. 4 crores/MW)	Cost of transmission/ distribution (@ Rs. 2.5 crores/MW)	Total cost
1	2	3	4	5
2002-2007	4,513	18,052.00	11,282.50	29,335.00
2007-2012	2,549	10,196.00	6,372.50	16,569.00
2012-2017	7,780	31,120.00	19,450.00	50,570.00
2017-2021	8,503	34,012.00	21,257.00	55,269.00
Total	23,345	93,380.00	58,362.00	1,51,742.00

It is not necessary that the investment of Rs.93,380 crores in the power generation sector should be done by the State Governments. They can have MOU with the power generating companies to purchase the required power.



WATER

8.1 BACKGROUND

Water is an essential component in every aspect of life and must be valued and safeguarded. The NCR is a water scarce region, but can have sufficient water if this resource is conserved and managed properly. This is essential for the sustainable development of the region. The "National Commission on Water for the year 2051" has recommended that water should be considered as a National Asset and should not be treated as 'State subject'.

NCR is endowed with four perennial rivers namely the Yamuna, Hindon and Kali passing through it and the Ganga skirting its eastern boundary. Main sources of water supply in the region are surface and ground water (e.g. rivers, canals, tubewells, hand pumps and open wells). While the U.P. Sub-region has abundant ground water, the area west of river Yamuna comprising the districts of Gurgaon, Rohtak, Sonapat, Jhajjar and most part of Faridabad district in Haryana, Alwar in Rajasthan and large part of NCT-Delhi have insufficient ground water, which is often brackish in quality rendering it unpalatable for domestic consumption. Delhi draws its water needs mostly from the Yamuna and Western Yamuna canal and partly from Ranney wells and tubewells in Yamuna belt and Upper Ganga canal system. There is generally a wide demand-supply gap of water in NCR and the problem becomes acute in dry summer months.

Regional Plan-2001 proposed norms and standards of water supply in urban area, particularly for the DMA (now CNCR) and Priority towns to be comparable to that of Delhi, with a target of starting the rate of water supply at 225 lpcd and achieving a rate of 363 lpcd by 2001. This norm was also stipulated in Master Plan for Delhi-2001. Rate of water supply was proposed varying from 100 lpcd to 275 lpcd for the other NCR towns of sizes one to five lakhs respectively. Rate of water supply for rural areas was proposed as 70 lpcd (including 30 lpcd for cattle).

Review of Regional Plan-2001, done in the year 1999, observed that the norms and standards for water supply had not been achieved. Even in Delhi, the national Capital, water supply norms could not match the Delhi Master Plan-2001 norms of 363 lpcd and remained on an average at about 225 lpcd. Further, in the NCR the water resources were found to be totally inadequate to meet the demand of even the domestic sector with limited availability of piped water supply. During the summers, water scarcity worsened in the entire region including Delhi. The review also suggested reduction in norms and standards to make them realistic and achievable.

8.2 EXISTING SITUATION AND ISSUES

The study has indicated that barring Delhi, which has an average water availability of 225 lpcd, per capita rate of water supply in urban centres of Haryana Sub-region ranges from 45 lpcd in Ganaur to 145 lpcd in Panipat, 35 lpcd in Shahjahanpur to 98 lpcd in Alwar in Rajasthan Sub-region and 28 lpcd in Phalauda to

142 lpcd in Meerut in Uttar Pradesh Sub-region. Status of availability of drinking water supply in some of the towns of NCR in the year 2000 is given in Annexure 8/I. Per capita availability of water in most of the urban centres has dwindled over the last decade due to rapid urbanisation and lack of financial resources for augmentation.

The status in rural areas presented a dismal picture since not enough database was available to exactly determine the position of water supply in these areas. Moreover, many villages did not have local sources of water and almost equal numbers did not have adequate sources.

There were neither sufficient financial resources nor the water sources available to achieve ambitious norms and targets fixed in Regional Plan-2001.

8.2.1 Lack of Regional Planning Approach

Towns/Cities have so far been planned by their respective authorities for their individual needs. There has been total lack of regional approach for sustainable use of available water and its conveyance from areas of plenty to scarcity. The raw water augmentation should not be territory specific but it should be region-wise irrespective of State boundaries.

8.2.2 Dependence on Outside Sources

In order to meet the raw water requirement of NCR, the major sources have been through inter- state allocations of the Yamuna water, Ganga water and, in future, through storage dams to be developed in Himachal Pradesh and Uttaranchal. However, so far these water storage reservoirs/dams have been considered as source only for Delhi and not for other parts of the region. Further, there has been lack of emphasis on planning and development of ground water sources including recharge of ground water through rainwater harvesting and schemes to harness the sources/potential of water in NCR which are necessary for sustainable development.

8.2.3 Unaccounted for Water (UFW)

There are significantly high losses at different stages of water supply system ranging from 30% to 50% in conveyance and distribution system apart from treatment plants including pilferages. These need to be capped to 15%.

8.2.4 Dependence on Plan Funds

State Governments and their local bodies operating and maintaining the water supply schemes are totally dependent on plan funds. There is a wide gap between revenue and expenditure of the local bodies. Characteristics like ineffective billing, poor collection of revenue and operation and maintenance inefficiencies etc. attribute to bad financial health of the local bodies. There is need to introduce efficiency of services i.e., efficiency in cost recovery and demand management through telescopic pricing in order to improve the revenue generation.

8.2.5 Regional Plan-2001: Norms and Standards

The drinking water supply norms proposed in Regional Plan-2001 and Master Plan for Delhi-2001 could not be met because neither adequate financial resources were allocated to meet their requirement nor physical efforts to tie up the water resources management had been undertaken.

8.2.6 Depletion of Ground Water

Ground water is depleting at a very fast pace in the region and the quality of ground water is also deteriorating due to over exploitation and contamination. Historical water bodies/ponds are being neglected or encroached upon.

8.2.7 Areas Lacking Adequate Focus

Besides, there are certain areas which need focus in order to maintain the minimum standards of water supply and quality.

- Phased augmentation/replacement of distribution network in the congested areas.
- Public awareness and media coverage for minimizing wastage.
- Correct population forecasting for adequate planning for drinking water supply.
- Involvement of NGOs and private sector in operation and maintenance.
- Decline of ground water due to over-drawal and increase in the runoff due to urbanization.
- Contamination of ground water and surface water.

8.3 POLICIES AND PROPOSALS

In order to improve the overall situation in the National Capital Region for the perspective 2021, for the harmonized and balanced development of the region following strategies and policies are proposed:

8.3.1 Blueprint for Water Resources in the Region

Blueprint for water resources in the region including augmentation of drinking water should be prepared for NCR identifying all the potential surface water sources, ground water aquifers and inter-basin transfer of water. This should include water mapping, desilting, augmentation of existing lakes/depressions for storage of rain/flood water, rain water harvesting, reuse and recycling of waste water, measures for conservation of water, inter-basin transfer of water and include integrated land and water management for the region.

8.3.2 Integrated Regional Schemes for Augmentation of Drinking Water Supply (surface and ground) considering NCR as a Single Entity

While the demand for irrigation is to be met through various MOUs signed/to be signed/entered into by various riparian states, the demand for drinking water supply and industrial use is to be given priority in respective policies of the constituent States, facilitating for inter-basin transfer of water through regional schemes. Sub-region wise water demand is given in Table 8.1. Total tentative projected drinking water supply demand for the region in the year 2021 is 11,984 mld (11.984 MCM/day or 4,374 MCM/annum), which includes 5,822 mld demand for Delhi also. An equivalent demand has to be considered for industrial use. Therefore, integrated Regional Plan to augment water should be done for about 23,968 mld of water.

Long term solution will include construction of upstream reservoirs to store excess water during monsoon for use in the lean period and inter-basin transfer of water such as the Sardar-Yamuna link canal which envisages transfer of surplus waters of Sardar river for meeting various requirements in U.P., NCT-Delhi and further transfer for use in water short areas of Haryana and Rajasthan. Four multi-purpose projects namely Tehri, Kishau, Renuka and Lakhwar-Vyasi have been planned in the upstream Himalayan foothills. Presently, plans are on the anvil to draw water from these reservoirs for Delhi only. The system should be planned to provide water to the entire National Capital Region, through regional schemes of

water supply for all the urban and rural areas considering NCR as a single entity. Since Tehri Dam is likely to be commissioned soon, the water should be allocated from this dam for drinking water supply and industrial use of the entire NCR. All the future planning for multi-purpose dams should be done considering further demands of NCR.

Table 8.1: Sub-region Wise Drinking Water Demand

Sub-region	Drinking Water Requirement (mld)	
	2001	2021
1	2	3
Haryana	1,046	2,412
Rajasthan	266	664
Uttar Pradesh	1,433	3,086
NCT-Delhi	3,584	5,822
Total	6,329	11,984
	6.329 MCM/day	11.984 MCM/day
	2310.07 MCM/annum	4374.27 MCM/annum

8.3.3 Norms and Standards

Following minimum norms and standards should be adopted for drinking water supply in the region:

- Urban Settlements

Towns/Cities	Recommended Water Supply (lpcd)
NCT-Delhi	225
Population one lakh and above	200
Population below one lakh	135

Note: This includes demand for commercial areas and floating population.

- Rural Settlements: A minimum of 70 lpcd including a supply of 30 lpcd for cattle is proposed. If independent connections are proposed to be given, a minimum rate of 100 lpcd of water supply has been advised. Spot sources may supply a minimum of 40 lpcd, which can supplement the piped supply. In rural areas, where water is provided through public standposts, 40 lpcd should be considered. In urban villages rate of water supply should be similar to the town with which it is surrounded.
- Unaccounted for water should be limited to 15%.
- The bulk requirement of institutional establishment should be assessed separately with proper justification.
- Fire fighting requirement should be added to this as per norms in the CPHEEO water supply Manual.

8.3.4 Protection of Land for Ground Water Recharging

Study done by Central Ground Water Board (CGWB) has revealed that an additional exploitation to the extent of 1,816 mld (1.82 MCM/day), 454 mld (0.45 MCM/day) and 908 mld (0.91 MCM/day) of water could be made available by harvesting the ground water potential of aquifer system of river Yamuna, upper Ganga canal system and Ganga flood plains respectively falling within NCR. In the Sub-regional Plans and Master/Development Plans, all the flood plains and other ground water recharging areas such as ponds, lakes, other water bodies etc. should be identified and protected from the invasion by other land uses and encroachments. Some of the areas to be protected for ground water recharging have already been identified in the Plan on the basis of the study done by Indian Institute of Remote Sensing, Dehradun "Geology, Geomorphology and Ground Water prospects for NCR". At least, 2-5% area should be earmarked under water bodies (natural as well as constructive) in the distribution of land uses. Areas with very good ground water prospects, riverbeds, ponds, ox-bow lakes, paleo-channels, etc., which need to be protected, have been marked in the Map 8.1 National Capital Region: Ground Water Recharge Areas).

The analysis of the water rechargeable areas in NCR shows that only 2.29% area of the total NCR has potential rechargeable areas (refer Table 8.2).

Table 8.2: Potential Water Rechargeable Areas (in sq kms)

Sub-region	Flood Plain and River Bed	Ox-bow Lake	Paleo-Channel	Valley Fill	Lake, tank and Pond	Total
1	2	3	4	5	6	7
NCT-Delhi	25	Nil	2.5	Nil	5.5	33
Haryana	68.88	4.25	5.13	21.7	62.65	162.61
Rajasthan	17.75	Nil	Nil	127.75	9.14	154.64
Uttar Pradesh	227.35	Nil	84.74	Nil	32.26	344.35
Total	338.98	4.25	92.37	149.45	109.55	694.6

Note: The area figures are approximate

8.3.5 Recharge of Aquifer

Since construction of dams as proposed above, would take long time to complete, it becomes necessary to think of other means to augment the water resources. Therefore, it would be necessary to adopt recharge of the aquifer by various means as detailed below:

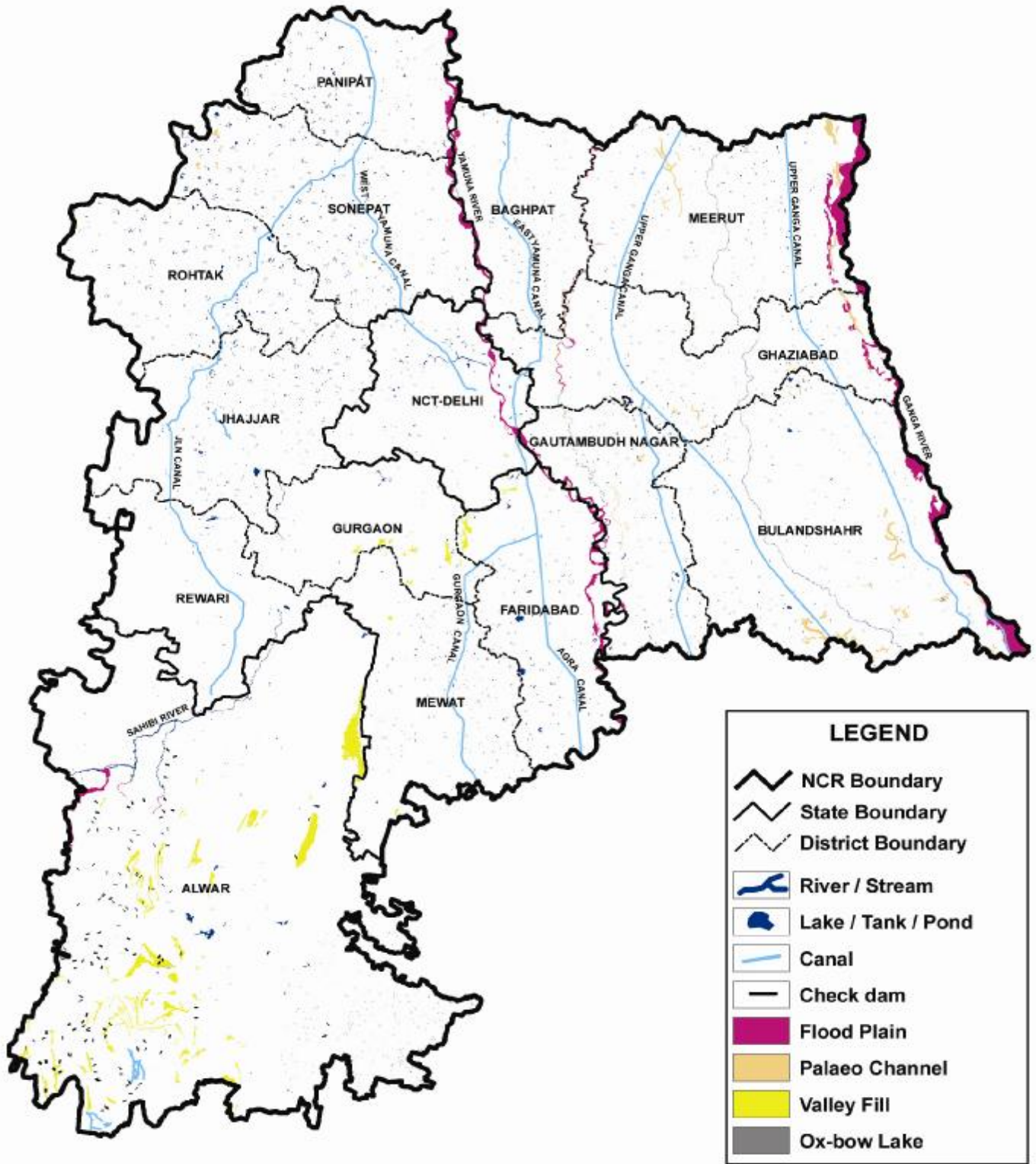
- Artificial recharge through rainwater harvesting in ponds, Yamuna flood plains, construction of small check dams at favorable locations in part of the ridge for recharge etc.
- Utilizing surplus canal water during monsoon period for recharging the depleted aquifers.
- Roof- top rain water harvesting should be made mandatory in building bye-laws especially in the over exploited and dark Blocks i.e., the areas with unsustainable ground water resources as identified by CGWB.
- Indian Institute of Remote Sensing, Dehradun submitted a report on "Geology, Geomorphology and Ground Water prospects for NCR" in April 2002. It has given suggestions on the recharge of the aquifer of NCR region as under:
 - § Rainwater harvesting etc.
 - § Flushing out of aquifers of the most polluted region
 - § Recharging of affected aquifers with good quality water
 - § Providing drainage in the area of stagnation of ground water
 - § Closing or relocation of polluting industries
 - § Consultation with expert from ground water and soil department for other approaches.

Thus, the preparation of blueprint after a detailed study becomes much more important and should be taken up on priority and these issues can be taken up in this study.

8.3.6 Relocation of Water Consuming Industries

Intensive urban development/induced developments/water consuming industries, should not to be recommended/proposed in over exploited/dark blocks of ground water potential as per Central Ground Water Board, Ministry of Water Resources in Sub-regional and Master/Development Plans. Status of availability of ground water including dark and over-exploited areas in the region is shown in Map 8.2 National Capital Region: Status of Ground Water Availability.

NATIONAL CAPITAL REGION GROUND WATER RECHARGABLE AREAS



LEGEND

- NCR Boundary
- State Boundary
- District Boundary
- River / Stream
- Lake / Tank / Pond
- Canal
- Check dam
- Flood Plain
- Palaeo Channel
- Valley Fill
- Ox-bow Lake

0 5 10 20 30 40 50 Kms

NATIONAL CAPITAL REGION PLANNING BOARD

MAP 8.1

Source: NRSA Study

8.3.7 Recycling of Waste Water for Non-Drinking Use

All new development areas should have two distribution lines, one for drinking water and other for non-drinking water/recycled treated waste water to reuse the treated waste water. All the waste requirements for non-drinking purpose in big hotels, industrial units, air-conditioning of large buildings/institutions, large installations, irrigation of parks/green areas and other non-potable demands should be met through treated recycled waste water as per norms. At least 50% of the treated waste water should be recycled for these purposes and emphasis should be laid towards waste minimization, which will also help in improving the environment on the whole. Government may also provide liberal tax rebates for institutions/industries adopting recycled waste water to compensate for the cost involved in treating waste water for recycling. Fresh water should not be used for irrigation purpose if treated waste water is available. If required, enabling provisions in the respective acts of the local bodies may be made by the respective State Governments.

8.3.8 Creation of Mass Awareness

It is imperative to create mass awareness among public through mass media with regard to saving water, waste minimization and utilization of sprinkler/drip irrigation techniques to save water for human consumption.

8.3.9 Commercial Approach for Tariff

With the increased requirement of improved quality as well as adequate quantity of water, the Government alone will not have financial capacity to continue with subsidies for improving the water supply systems in times to come. Metering coupled with improved recovery of revenue may help reduce the revenue-expenditure gap. The tariff should be fixed to meet at least the operation and maintenance cost of the water supply system, if not the capital cost of the system. The structure of the water tariff should be demand based and increase telescopically depending upon the monthly consumption and should be reviewed periodically as a built-in mechanism to make the service self-sustaining and a deterrent to wastage. Tariff for the recycled treated waste water should be fixed accordingly to encourage its non-potable uses such as gardening, horticulture and other uses referred above. Commercial approach should be adopted by the local bodies for revenue generation. 'Public-Private Partnership' needs to be introduced for operation and maintenance of the water supply schemes.

8.3.10 Institutional Capacity Building

Water demand management and institutional capacity building measures, e.g. zoning, setting up a contingent valuation fund, transparent operation-maintenance, regulatory guidelines etc. for efficient operation of the system contribute towards improvement in the finances.

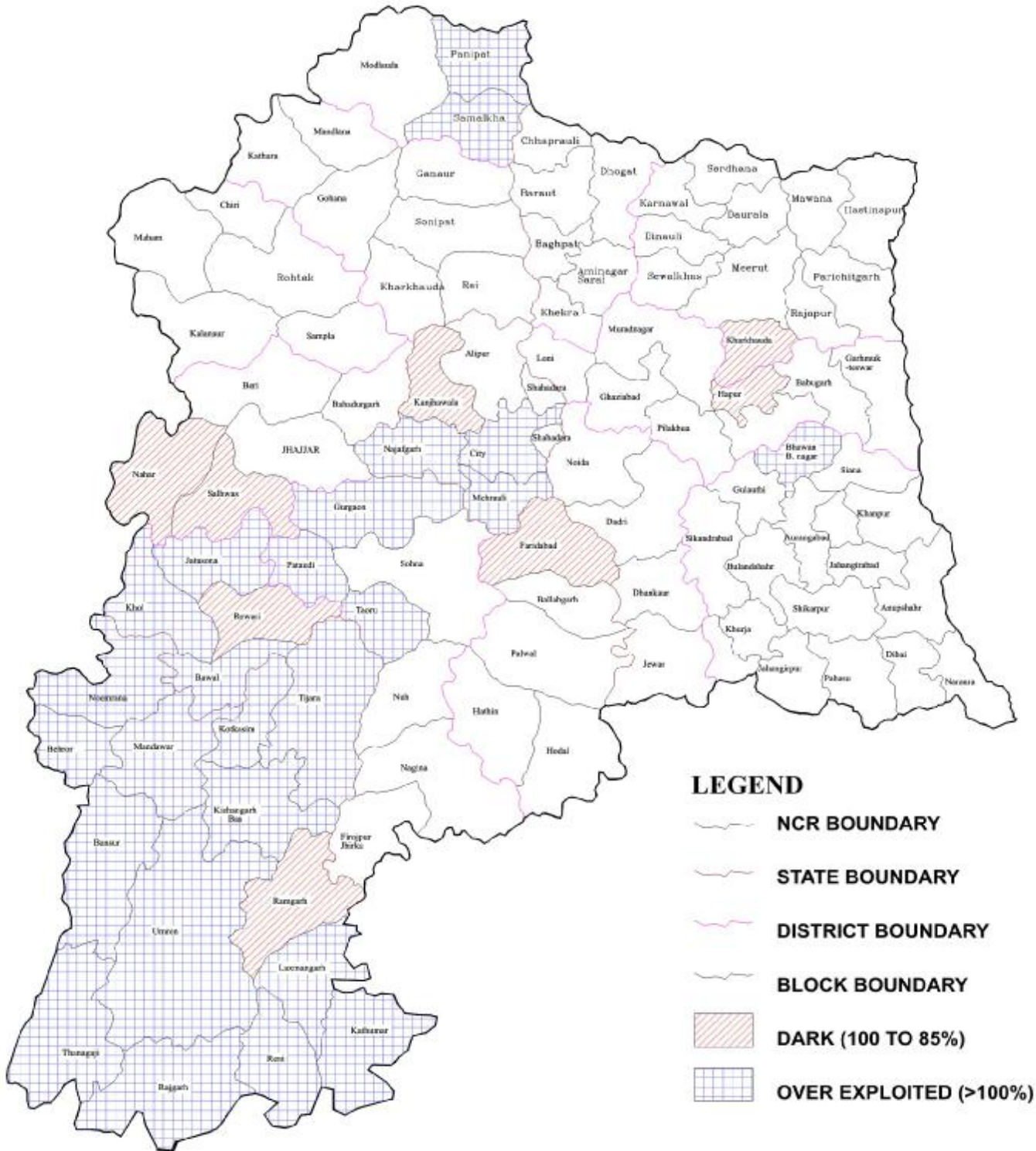
8.3.11 Quality of Drinking Water

The quality of water should conform to the BIS standards and CPHEEO Manual for water supply and its treatment.

8.3.12 Allocation of land for Water Treatment Plants and Water Distribution System

Planning of the city must incorporate advance land allocations at appropriate places for different components of water treatment and distribution systems. 0.1 hectare per mld of land area should be reserved for Water Treatment Plant at suitable locations in the town. This area, however, does not include storage of raw water where water supply is based on rotational canal system, additional land will have to be provided for underground/overhead/surface storage reservoir and for boosting stations.

NATIONAL CAPITAL REGION STATUS OF GROUND WATER AVAILABILITY



Source: CGWB

8.3.13 Funding of Water Supply Schemes through Five-Year Plans

Present state of affairs of utility and service infrastructure in the region, barring Delhi, is dismal due to non-availability of funds for these sectors. Therefore, some mechanism should be developed under the five-year plans so that funds are made available to the State Governments for the development of infrastructure in their respective Sub-region for balanced and harmonious development. Provision for Special Component Plan for NCR should be made by the Planning Commission for the National Capital Region.

Centrally Sponsored Schemes for Infrastructure Development in NCR should be formulated which should include augmentation of drinking water supply schemes as one of the components. The scheme should be structured as follows:

State share	25%
Central Government Grant	25%
NCRPB Interest Bearing Loan	50%

The State Government's share should be provided in the Plan as a part of the Sub-component Plan for NCR Sub-region of the respective States, while the Central Government grant could be a part of the NCR Planning Board's central budgetary provision. The loan component can be met by the NCR Planning Board through its Internal Extra Budgetary Resources (IEBR).

Augmentation and upgradation of water supply in older areas should be financed through this funding. External Development Charges (EDC) collected by the development authorities from a town should be invested within the same town in proportion to the population of existing town proposed to be developed. In all new areas being developed, the capital cost of water supply systems should be self-financing and be met out of EDC.

8.4 PLAN OF ACTION AND PHASING OF IMPLEMENTATION OF STRATEGIES/ POLICIES/PROPOSALS

In order to implement the policies of water in the region, it is imperative to have a plan of action along with phasing so that the implementation of policies and proposals in the Regional Plan can be dovetailed with the five-year plans. In view of this, it is necessary that each recommendation should be phased plan wise where certain activities are to be completed within first five-year of the implementation of the Region Plan, whereas some activities will span over to all the four five-year plans.

Some of the activities which need to be implemented in the first five years of implementation of the Regional Plan include preparation of the Blue Print for water resources, an integrated regional scheme for augmentation of drinking water supply, protection of identified water bodies, to reserve 2-5% of land for ground water recharging, water consuming industry not to be set up in proposed over exploited/dark blocks of ground water potential, industries/hotels/large institutions to be compelled to use at least 50% of their waste water in their institutions itself and no fresh water should be allowed to be used for agriculture/horticulture purpose in the inhabited areas to promote use of treated waste water. Amendment in act/statue, if required, be carried out for the reuse and recycle of waste water.

Improvement in the existing water supply system in the region, as recommended above have been proposed to be carried out in a phased manner in the five-year plans. Phased programme and plan of action have been worked out to give effect to the proposal and implementation thereof, which is given in Annexure 8/II.

8.5 INVESTMENT PLAN

Total water requirement in the region would be 11,984 mld by the year 2021. Accordingly, there will be need to produce additional water and to strengthen/expand the water supply distribution system in the region. Total investment required for the production/augmentation of water would be about Rs.5,992.15 crores by the year 2021 and for strengthening/expansion of distribution system/network, it would be about Rs.7,190.57 crores. This cost does not include the cost of conveying water from long distances through canals/pipes. Sub-region wise fund requirement for the region has been given in the following table:

Table 8.3: Sub-region wise Investment Requirement for Drinking Water Demand (Rs. in Crores)

Sub-region	Distribution Network (@ Rs. 0.60 crores per mld)	Production of Water (@Rs. 0.50 crores per mld)	Total
1	2	3	4
Haryana	1,447.21	1,206.01	2,653.22
Rajasthan	398.24	331.87	730.11
Uttar Pradesh	1,851.99	1,543.33	3,395.32
NCT-Delhi	3,493.13	2,910.94	6,404.06
Total	7,190.57	5,992.15	13,182.72

This estimation has been done on the basis of assumption that facilities of 50% of water generation, 60% of population coverage and 50% area is covered with surface water, is presently available in the region. Plan wise fund requirement for the region is as follows:

Table 8.4: Plan wise Fund Requirement for Drinking Water

Plan Period	Percentage (%)	Amount (Rs. in Crores)
1	2	3
2002-2007	20.0	2,637
2007-2012	30.0	3,955
2012-2017	30.0	3,955
2017-2021	20.0	2,637

Above table clearly mentions the break-up of the fund required for various phases on the basis of consecutive five-year plans. Fund requirement varies from Rs.2,637 crores in the 10th Plan period (2002-2007) to Rs.3,995 crores in the 12th Plan period (2012-2017).

Phasing of investment has been proposed on the basis of plan of action for implementation, which is given in Annexure 8/II.



SEWERAGE, SOLID WASTE MANAGEMENT, DRAINAGE AND IRRIGATION

9.1 SEWERAGE

9.1.1 Background

Sewerage is the core element of physical infrastructure that determines the environmental status of any settlement and as such requires minute planning, development and management. Development of appropriate sewage carriage system with efficient treatment is the key element, which acts as a prerequisite for facilitating balanced and harmonized development. Augmentation of existing inadequate systems/treatment facilities as well as adoption of new technologies of waste treatment for small and marginal settlements and rural areas presents a gigantic task demanding special efforts.

In the Regional Plan-2001, it has been proposed that the DMA and priority towns should treat sewage before it is discharged into the watercourses or on land or used for irrigation. The other towns where it is not possible to provide a proper system due to topography and for want of resources, low cost sanitation measures may be adopted which can be replaced by regular sewage system subsequently. Sewage should be treated to bring the pollution level to permissible limits as stipulated by the Bureau of Indian Standards (BIS) and Pollution Control Boards irrespective of the type of disposal of the sewage. As far as possible, areas where the annual rainfall exceeds 75 cm, separate systems for sewage and storm water are recommended. Rural areas, where piped water supply system exists, should be provided with sewerage system with treatment facilities. Low cost sanitation measures such as sanitary latrines with septic tanks and soak pit should be provided in the villages with hand-pumps based water supply.

A review of Regional Plan-2001 was done in the year 1999, in which it was observed that only 20% towns of NCR were covered with partial sewerage system, while the rural areas did not have any access to such facilities. Since the last decade, no major progress has been made with regard to sewage treatment plants. The rivers (mainly Yamuna) and various seasonal streams had been converted into “*Nallahs*” which carry untreated sullage polluting downstream areas. Some newly developed urban areas namely Faridabad, Gurgaon (in Haryana) and NOIDA (in U.P.) have installed sewage treatment plants provided by development authorities but reportedly not fully functional due to a variety of reasons.

9.1.2 Existing Situation and Issues

Recent studies reveal that at present barring Delhi, where 80% population is covered under sewerage and 1,500 mld of waste water is being treated, the sewerage cover ranges from 30 to 70% in U.P. and 60% to 80% in Haryana in the DMA (now CNCR) towns only. Among the CNCR towns, treatment facilities are available in Faridabad, Gurgaon, Ghaziabad and NOIDA. No sewerage treatment facility is available in any of the priority towns of U.P. Sub-region or Rajasthan Sub-region. Coverage of sewerage system in various priority towns ranges from 40.0% to 70.0% in Haryana, 3.0% to 5.0 % in Rajasthan and 0.0% to 30% in Uttar Pradesh. Status of availability of sewerage system and treatment facilities in some of the NCR towns in the year 2000 is given at Annexure 9/I. Not enough database is available to determine the

position of sanitation in rural areas. However, the overall picture is dismal. High incidence of water borne diseases in NCR is indicative of the poor state of sanitation in the region.

- ***System Drawbacks and Lack of Coverage***

The expansion of sewerage network has lagged behind the growth of population resulting in overflow of sewage into drains causing river pollution or creation of cess pools in low lying areas of the towns/settlements. There are imbalances in the coverage of municipal sewerage systems in various parts of the cities. Significant portion of the city population living in marginal settlements, unauthorized colonies and urban villages etc. has been devoid of regular municipal sewerage systems. In old cities like Delhi, sewerage system of the walled city is quite old and overloaded, which requires phased replacement or rehabilitation.

Development authorities which are associated with development of new areas in various towns/cities tend to take care of sewerage system in newly developed sectors only. Many a times no sewage treatment facilities are provided there and untreated sewage is allowed to flow into the nearest open drain/water bodies or even just allowed to spread over large tracts of land. Provision of sewerage system and treatment facilities in the existing areas is considered as the sole responsibility of the local bodies which have neither sufficient financial resources nor appropriate technical staff to provide such facilities. They are totally dependent upon the State Government for this, whose resources are also limited.

- ***Lack of Operation & Maintenance and Management Effort***

Poor maintenance of the sewerage system by the local bodies and development authorities (in their respective areas of maintenance) has resulted in blocking and overflowing of sewers, open manholes and back-flows. The inadvertent act of throwing street sweepings and garbage by street sweepers into manholes/open drains results in blocking of sewers and creates cess pools resulting in environmental degradation, foul smell and disease. Re-densification of population in the existing townships and lack of proportionate improvement in sewerage systems have resulted in overflowing of sewers and manholes due to insufficient carrying capacity of sewers, thus, resulting in environmental degradation of the towns. Age old system of cleaning of sewers is still followed instead of use of modern machines like jetting cum suction machines, which are quick and do not damage the skin of the sewers, which is one of the main causes of subsidence of sewers.

- ***Lack of Waste Minimization and Recycling/Reuse***

The emphasis should be on waste minimization, which will help in improving the environment as a whole. Recycled waste water should be promoted for non-drinking purposes. Hotels, industrial units and large installations should be asked to recycle their waste water. Fiscal measures such as quantum based taxation for waste water should be taken up which will not only reduce the cost of treatment for the municipalities but will ultimately help in improving the overall environment of the cities

- ***Other Areas Lacking Adequate Focus***

Besides, other aspects/areas, which need attention include:

- § Population living in marginal settlements and slum areas lack coverage.
- § Small and medium towns and large villages, having population above 5,000 persons, should be provided with the requisite sewerage/sanitation facilities.
- § Phased augmentation/replacement of sewers in congested areas of the cities.

- § Suitable legislation/amendments to check mixing of industrial waste with domestic sewage and disposal of untreated sewage into open drains.
- § Rural settlements need special focus where presently no sanitation exists.

9.1.3 Policies and Proposals

In order to improve the overall situation in the National Capital Region for the harmonized and balanced development for the perspective 2021 following policies and strategies are proposed:

- ***Preparation of Master Plan for Sewerage System and its Treatment***

Each participating State with the help of the specialized agencies, experts and NGOs should take up the preparation of detailed Master Plans for laying/augmenting sewerage system and its treatment for all the towns. The Master Plans should also have a provision for recycling the treated effluent for irrigation, gardening and cooling in industries/hotels. Common effluent treatment plants in planned industrial estates should compulsorily be set up.

- ***Norms and Standards***

Norms and standards provided in the CPHEEO Manual for sewerage and its treatment should be followed.

All towns identified for development in the Regional Plan-2021 should have cent percent sewerage system and should treat their sewage up to the desired standards including coliform, under the Environmental Protection Act, 1986 before it is discharged on land for irrigation, plantation, gardening etc. or into the water bodies. Towns within NCR, which do not have sufficient resources or have unsuitable terrain to provide proper sewerage system and treatment facilities, may initially be provided with low cost sanitation systems which can be upgraded in the later stages within the time frame of this Plan.

All the urban villages should be provided with the facilities equivalent to the towns, within whose controlled areas they are located. Large villages may be provided with low cost sewage treatment facilities with appropriate sewerage system. Other rural areas should be provided with low cost sanitation measures such as sanitary latrines, septic tanks and soak pits.

These norms and standards should be implemented in the phased manner in the region.

- ***Rehabilitation/Augmentation of Sewerage System and Treatment Facilities***

Poor condition of existing sewerage system in townships/cities should be rehabilitated and wherever, this facility is not available or is not up to the desired level, augmentation schemes, should be taken up. Since treatment facilities in most of the townships are insignificant, emphasis should also be given to provide the same, as per the requirement. Sub-region wise sewage generation is in Table 9.1.1. Total sewage expected to be generated in the region by the year 2021 is 6,935 mld which includes 1,123 mld in Haryana Sub-region; 282 mld in Rajasthan Sub-region; 1,480 mld in U.P. Sub-region and 4050 mld in NCT-Delhi Sub-region.

Development authorities should provide sewage treatment facilities simultaneously while developing the area in phased manner. No untreated sewage/waste water should be allowed to flow in the neighbouring areas/States. Piecemeal approach to laying of sewer should be avoided.

Table 9.1.1: Sewage Generation in Urban Areas of NCR

Sub-region	Sewage Generation (mld)	
	2001	2021
1	2	3
NCT-Delhi	2,493	4,050
Haryana	394	1,123
Rajasthan	53	282
Uttar Pradesh	576	1,480
Total	3,516	6,935

Note: This does not include the UAF

- ***Operation and Maintenance***

Operation and maintenance should be given priority by the local bodies using modern technology/equipments.

- ***Policy of Dual Agencies***

The policy of having dual agencies for the construction and operation & maintenance of these facilities in some of the constituent States should be discouraged. In order to have better environmental management and to avoid over-loading/under-loading of the system and for focused accountability, overall management of sewerage system and surface drains with its effluent treatment facilities should be with single agency in a given town.

- ***Allocation of Land for Sewerage Schemes***

Master/Development Plans of the towns and cities should incorporate land allocations at appropriate locations for following components of the sewerage schemes:

- § Adequate space for underground laying of sewers along roads as per standard cross sections.
- § Depending upon quantity of sewage to be pumped, land area for sewage pumping stations needs to be allocated. On an average, area of 0.25 hectare should be reserved for each pumping station.
- § 0.2-1.0 hectare/mld land area should be reserved for sewage treatment plant as per the technology adopted, keeping in view the size of the town/area.

- ***Recycling of Waste Water for Non Drinking Water Use***

All new development areas should have two distribution lines, one for drinking water and other for non-drinking water/recycled treated waste water for reuse. All the waste requirements for non-drinking purpose in big hotels industrial units, central air-conditioning of large buildings/institutions, large installations, irrigation of parks/green areas and other non-potable demands should be met through treated recycled waste water.

At least 50% of the treated waste water should be recycled for these purposes and emphasis should be laid towards waste minimization, which will also help in improving the environment on the whole. Government may also provide liberal tax rebates for institutions/industries adopting recycled waste water to compensate for the cost involved in treating waste water for recycling. Fresh water should not be used for irrigation purpose, if treated waste water is available. If required, enabling provisions in the respective acts of the local bodies may be made by the respective State Governments.

- ***Creation of Mass Awareness***

It is imperative to create mass awareness among public through mass media with regard to saving of water, waste minimization and utilization of treated waste water for non-drinking purposes.

- ***Commercial Approach for Tariff***

With the increased requirement of improved quality of life, Government alone does not have financial capacity to continue with the subsidies for improving the sewerage system and treatment facilities in the times to come. Commercial approach should be adopted by the local bodies for revenue generation. Tariff should be so fixed as to meet at least the operation and maintenance cost of the sewerage system, if not the capital cost of the system. Introduction of sewage tax and improved recovery of taxes may help in reducing the revenue-expenditure gap.

The structure of the sewage tax should be demand based and increased telescopically depending upon the monthly consumption of water and should be reviewed periodically as a built-in mechanism to make the service self sustaining and a deterrent to wastage. Public-Private Partnership (PPP) needs to be introduced for operation and maintenance of the sewerage schemes and sewage treatment plants.

- ***Institutional Capacity Building***

Institutional capacity building measures for management of sewerage system and sewage treatment plants in the towns should be done for efficient operation and maintenance of the system. Simultaneously, it should contribute towards improvement in the self sustainability of the system.

- ***Funding of Sewerage and Sewage Treatment Schemes through Five-Year Plans***

Present state of affairs of utility and service infrastructure in the region barring NCT-Delhi is dismal due to non-availability of funds for these sectors. Therefore, some mechanism should be devised under the five-year plans so that funds are made available to the State Governments for the development of infrastructure in their respective Sub-regions for balanced and harmonious development. Provision for Special Component Plan should be made by the Planning Commission for the National Capital Region. Centrally Sponsored Schemes (CSS) for infrastructure development in NCR should be formulated, which should include sewerage and sewage treatment schemes as one of the component. The scheme should be structured as follows:

State share	25%
Central Government Grant	25%
NCRPB Interest Bearing Loan	50%

The share of State Government should be provided in the plan as a part of the Sub-component Plan for NCR Sub-region of the respective States, while the Central Government grant could be a part of the NCR Planning Board's central budgetary provision. The loan component can be met by the NCR Planning Board through its Internal Extra Budgetary Resources (IEBR). Augmentation and upgradation of sewerage schemes/sewage treatment plants in older areas should be financed through this funding. External Development Charges (EDC) collected by the development authorities from a town should be invested within the same town in proportion to the population of existing town proposed to be developed. In all new areas being developed, the capital cost of sewerage schemes/sewage treatment plants should be self financing and be met from EDC.

9.1.4 Plan of Action and Phasing of Implementation of Strategies/Policies/Proposals

In order to implement the policies of sewerage system in the region it is imperative to have a plan of action along with phasing so that the implementation of policies and proposals in the Regional Plan can be dovetailed with the five-year plans. In view of this, it is necessary that each recommendation should be phased plan-wise where certain activities are to be completed within the first five-year of the implementation of the Region Plan, whereas some activities will span over to all the four-five year plans. Some of the activities which need to be implemented in the first five years of the Regional Plan

implementation include, preparation of the Master Plans for sewerage system and its treatment, creation of mass awareness, allocation of land, recycling of waste water and industries/hotels/large institutions to be compelled to use at least 50% of their waste water in their institutions itself and no fresh water should be allowed to be used for agriculture/horticulture purpose in the inhabited areas to promote use of treated waste water. Amendment in act/statute, if required, should be carried out for the reuse and recycle of wastewater. Improvement/augmentation in the existing sewerage system and construction of sewage treatment plants in the region, as recommended above have been proposed to be carried out in a phased manner in all the five-year plans.

Phased programme and plan of action have been worked out to give effect to the proposal and implementation thereof, which is given in Annexure 9/II.

9.1.5 Investment Plan

Total estimated sewage generation in the urban areas of the region is estimated to be 6,935 mld by the year 2021. Accordingly, there will be need to strengthen/expand the sewerage system and its treatment capacities. Total investment required for laying of sewerage system would be Rs.3,467.47 crores by the year 2021 and for treatment of waste water, the investment would amount to Rs.4,854.46 crores. It is based on the existing situation given in para 9.1.2 above. However, Sub-region wise and Plan wise fund requirement for the region has been given in the following tables:

Table 9.1.2: Sub-region wise Investment requirement for Sewage (Rs. in Crores)

Sub-region	Sewerage System (@ Rs. 0.50 crores per mld)	Sewage Treatment Plant (@ Rs. 0.70 crores per mld)	Total
1	2	3	4
Haryana	561.49	786.08	1,347.57
Rajasthan	140.80	197.13	337.93
Uttar Pradesh	740.18	1,036.25	1,776.43
NCT-Delhi	2,025.00	2,835.00	4,860.00
Total	3,467.47	4,854.46	8,321.93

Table 9.1.3: Plan wise Investment requirement for Sewage

Plan Period	Percentage (%)	Amount (Rs. in Crores)
1	2	3
2002-2007	15.0	1,248.29
2007-2012	35.0	2,912.68
2012-2017	30.0	2,496.58
2017-2021	20.0	1,664.39

Land for the total plan period should be acquired at the first instance. Phasing of investment has been proposed on the basis of plan of action for implementation given in Annexure 9/II.

9.2 SOLID WASTE MANAGEMENT

9.2.1 Background

Solid Waste Management (SWM) is one of the most expensive municipal services that a local body has to provide as its obligatory municipal function and absorbs about 1% of GNP in the urban areas. About three to six persons per 1000 population are required to cater to this important civic amenity, which is about 1% to 2% of the total National Work Force. It is, therefore, imperative to optimize this huge civic expenditure and evolve an indigenous low cost technology which is technically sound, financially viable, aesthetically beautiful and socially acceptable to public.

Regional Plan-2001 proposed that solid waste disposal and management should be planned for a minimum period of 20 years and at least controlled tipping should be adopted in the disposal of the solid waste. Areas should be identified in all the towns for sanitary landfill and, all the towns above one lakh population should have arrangements to properly manage the waste disposal.

In the review of Regional Plan-2001 it was observed that large quantities of solid waste (garbage) were generated daily, out of which very little was collected. NCT-Delhi, however had comparatively better collection (70% of the waste) than rest of NCR towns. Most landfill sites are brimming to the full and vacant sites for landfill are not available in Delhi. No specific sites have been identified in any Sub-regions for disposal of solid wastes and landfill.

9.2.2 Existing Situation and Issues

Studies have revealed that none of the towns in the region are disposing off solid waste in environmental friendly manner. The landfill sites are not lined to protect the ground water from leachate percolating into it. No other disposal system has been adopted by the local bodies. The status of availability of solid waste management facilities in some of the towns of NCR in the year 2000 is at Annexure 9/III.

As per estimates, at present 13,499 MT/day of garbage was being generated in the year 2001 in the region, of which about 1,540 MT/day was being generated from Haryana Sub-region, 201 MT/day was being generated from Rajasthan Sub-region and 2,270 MT/day was being generated from U.P. Sub-region and remaining from the NCT-Delhi Sub-region. Total garbage generation in the region is likely to be about 27,236 MT/day by the year 2021 and handling of this kind of waste will need special efforts and funds. Sub-region wise details have been given in Table 9.2.1.

Table 9.2.1: Solid Waste Generation in NCR

Sub-region	Garbage Generation (in MT/day)	
	2001	2021
1	2	3
NCT-Delhi	9,488	15,413
Haryana	1,540	4,569
Rajasthan	201	1,116
Uttar Pradesh	2,270	6,138
Total	13,499	27,236

Since land is a resource, the disposal methodologies for solid waste cannot remain only sanitary landfill. We have to examine other environmental friendly and financially viable options also.

Some of the major issues in this sector include:

- ***Lack of Knowledge of the Local Bodies***

Local bodies adopt casual approach for the management of solid waste. Most of the municipalities are not aware of the ways and means to dispose off solid waste that is generated in their respective towns. Even the collection and transportation system of solid waste is not up to the mark. Major chunk of the revenue generation from the city is eaten away in managing the solid waste, which is done inefficiently.

- ***Non-availability of suitable Land for Solid Waste Disposal in Environmental Friendly Manner***

most of the towns, no land is earmarked for the disposal of solid waste, neither as landfill site nor for disposal through other techniques. The Master/Development Plans, prepared by the Town

Planning Department, do not reflect this aspect. Many a times, land is earmarked for sanitation purpose, which includes the disposal of solid waste as well as a site for sewage treatment plant, which is insufficient for either use. Since location of the land plays an important role, therefore, it should be located in such a way that solid waste is disposed off in decentralized manner so that the transportation cost for the solid waste is optimized.

- ***Lack of Public Awareness***

People are not aware of the harmful effects of solid waste that litters around in towns and cities in the region. There is need for arranging awareness campaign in this regard.

- ***Non-Availability of Funds***

Local bodies do not have funds to handle this kind of waste and in future, as discussed above, the quantities are likely to increase manifold. In case the waste is not handled and disposed off in a scientific manner, it will reach unmanageable proportions in future. In view of this, the local bodies should improve their financial condition through better management and improve their revenue generation capacity. It should also examine the alternative options for optimization of transportation costs of solid waste.

- ***Piecemeal Approach for Handling of Solid Waste***

Local bodies do not have any Waste Management Plan for their towns/cities. The state of affairs is such that when the NCR Cells contacted the local bodies for data on solid waste to create database for solid waste management, some of the local bodies were not even aware of the quantum of solid waste generated in their town. Local bodies/municipalities are adopting piecemeal approach in this regard.

- ***Dependence on Departmental Staff causing Labor Related Problems***

Most of the local bodies are dependent upon their own staff for handling of solid waste, which has resulted in labour related problems. Major chunk of revenue is eaten away by way of paying wages, upholding transportation fleet, operation and maintenance etc. There is need for the local bodies to adopt a comprehensive approach to manage solid waste in terms of collection, transportation, treatment and disposal of waste factoring in various components like labour, equipment, vehicles, institutional arrangements etc.

- ***Other Deficiencies***

- § Lack of coverage

- § Poor collection system specially in the narrow and circuitous lanes, making the collection more difficult

- § Mixed variety of organic and inorganic solid waste

- § Non-involvement of NGOs/informal sector and private agencies.

- § Unsanitary conditions in and around community bins.

- § Handling of specialized wastes

- § Shortage of vehicles

- § Shortcomings at landfill sites

- § Organizational inadequacies

- § Shortage of equipment and committed supervisory staff

- § Financial stringency

9.2.3 Policies and Proposals

In order to improve the overall situation in the National Capital Region for the harmonized and balanced development for the perspective 2021, following policies and strategies are proposed:

- ***Preparation of Detailed Solid Waste Management Plan***

All the towns in NCR should prepare Solid Waste Management Plan in order to handle the waste being generated in their respective towns on the basis of guidelines provided by the CPHEEO Manual for the solid waste management. It would be appropriate that the local bodies plan for the whole city and decentralization should be done for disposal of solid waste for reducing the transportation cost.

- ***Norms and Standards***

Norms and standards provided in the CPHEEO Manual for solid waste management which provides guidelines for collection, transfer, transport and disposal of solid waste in environmental friendly manner should be followed. This also provides the directions for handling of medical and hazardous wastes. In this regard, the notification of the Ministry of Environment and Forests under the Environmental Protection Act, 1986 should also be followed.

- ***Identification of Land for Treatment/Disposal of Waste***

While preparing the Master/Development Plan for various towns/cities, Town Planning Department of respective Sub-regions should earmark the land for treatment/disposal of solid waste. The acquisition of these sites, by the development authorities and municipalities, should form a compulsory element of the development programme and properly budgeted for in their Plan documents.

In NCT-Delhi, the land is scarce and it should plan for future development considering the availability of land for various aspects because the solid waste generation in NCT-Delhi alone by the year 2021 has been projected as 15,000 MT/day, which requires about 28 sq kms of land for disposal of solid waste through sanitary land filling assuming that the depths of landfill will be 10 metres (partly below ground and partly above ground), density of solid waste is 0.85 MT per cubic metre, life cycle of landfill site is 20 years and there are three landfill sites. Details of various options examined are in Annexure 4/II. Land area of about 28 sq kms required for solid waste disposal through sanitary land fill, should be identified in the MPD-2021, which is under preparation. Another 85 sq kms of land area should also be kept reserved for solid waste disposal in future beyond year 2021.

Sanitary landfill sites should be designed and engineered properly to collect and treat leachate and biogas should be collected and utilized in a planned manner. Constituent States of NCR should also earmark land for solid waste disposal by sanitary landfill and other means appropriately.

- ***Waste Minimization-Recycling/Recovery of Resources***

In view of the limited availability of land for use as landfill sites, there is an urgent need to find other mechanical means of minimizing waste requiring disposal. In fact, we should aim at zero waste output. Fly-ash from proposed/existing thermal power plants should be utilized in environmental friendly manner by using it in the construction industry. The prevalent system of recycling/recovery of plastic, glass, metal, paper, etc. from the domestic waste is completely informal/unorganized. This should be done in more organized, scientific, cost effective and environmental friendly manner. The segregation of biodegradable waste from non-biodegradable waste such as plastics, glass, metal,

paper etc. at the source should be made compulsory in all towns/cities. Not more than 50% of the total solid waste generated should be disposed off through sanitary landfill.

- ***Public Awareness and Training***

Public awareness need to be created through mass media including T.V. and newspapers regarding the harmful affects of littering around and how the places can be kept clean. The informal training along with broad-based formal awareness through schools educational curriculum is also recommended. NGO's and Resident Welfare Association (RWA) should be actively involved in the public awareness campaign.

- ***Institutional Improvements***

Institutional capacity building measures are required to be taken in order to improve the efficiency and effectiveness of solid waste management at each stage such as waste collection, transfer/transportation, treatment and disposal. There is a need to associate NGOs/private sector also in this regard. The combination of private sector and public sector in proportionate ratios will be the right option.

In the rural areas, there is no mechanism for collection and disposal of solid waste. This should be developed by associating local Panchayats.

- ***Resource Mobilization***

Local bodies and Panchayats should improve their financial conditions through better financial management and should also improve the revenue generation capacities.

- ***Other Recommendations***

Other suggested measures, which are required to be taken, are as follows:

- § Adoption of closed bins and covered transportation vehicles
- § Modification of building bye-laws to ensure provisions of refuse storage
- § Safe and separate storage as well as doorstep collection of biomedical waste, hotel and yard waste etc. on full cost recovery basis.
- § Community participation

9.2.4 Plan of Action and Phasing of Implementation of Strategies/Policies/Proposals

In order to implement the policies of solid waste disposal in the region, it is imperative to have a phase wise plan of action so that the implementation of policies and proposals in the Regional Plan can be dovetailed with the five-year plans. In view of this, each recommendation has been phased plan-wise where certain activities are to be completed within first five-year of the implementation of the Region Plan whereas some activities will span over to all the four five- year plans. Some of the activities which need to be implemented in the first five years of the Regional Plan include preparation of the Solid Waste Management Plans for all the towns, creation of mass awareness, allocation of land, waste minimization through recycling of solid waste. Construction of solid waste disposal sites and treatment plants in the region, as recommended above, have been proposed to be carried out in a phased manner in all the five-year plans.

Phased programme and plan of action have been worked out to give effect to the proposal and implementation thereof, which is at Annexure 9/II.

9.2.5 Investment Plan

Total solid waste generation in the urban areas of the region would be about 27,236 MT/day by the year 2021 and accordingly, there will be need to develop appropriate system for collection, transportation and disposal of solid waste in environmental friendly manner either through properly designed sanitary land filling or through other treatment methods. Total investment required for this would be about Rs.1,361.81 crores up to the year 2021. However, Sub-region wise and Plan wise fund requirement for the region has been given in the following table:

Table 9.2.2: Sub-region wise investment required in Urban Areas for SWM

Sub-region	Requirement @ Rs. 0.05 crores per MT (Rs. in Crores)
1	2
Haryana	228.46
Rajasthan	55.80
Uttar Pradesh	306.92
NCT-Delhi	770.63
Total	1,361.81

Assuming investment at the rate of Rs. five lakhs per MT, total fund requirement within NCR is estimated to be Rs.1,361.81 crores. Haryana Sub-region requires Rs.228.46 crores, Rajasthan Sub- region requires Rs.55.80 crores, Uttar Pradesh requires Rs.306.92 crores while NCT-Delhi requires Rs.770.63 crores.

Table 9.2.3: Plan wise Investment required for SWM

Plan Period	Percentage (%)	Amount (Rs. in Crores)
1	2	3
2002-2007	40.0	544.73
2007-2012	25.0	340.45
2012-2017	20.0	272.36
2017-2021	15.0	204.27

The investment for solid waste management in the 10th Plan is estimated to be Rs.544.73 crores, for 11th Plan Rs.340.45 crores, while for 12th Plan it is projected to be Rs.272.36 crores and for 13th Plan the estimate is Rs.204.27 crores.

9.3 DRAINAGE

9.3.1 Background

Drainage is an important element of physical infrastructure and constitutes removal and disposal of surplus rain/irrigation water from the land. It has two aspects namely flood protection and removal of storm water. National Capital Region in general, is a part of well integrated drainage system of the Ganga basin. The extremely gentle gradient that spreads almost all over the region restricts the degradational activities of the streams/drains. The storm water discharge in any basin/sub-basin of NCR is not local but has regional bearing covering areas of Haryana, Rajasthan, Uttar Pradesh and NCT of Delhi. It is, therefore, necessary to plan the drainage system at regional level in an integrated manner with adjoining States. Topography, rainfall intensity, soil characteristics, irrigation methods, crops and vegetative cover are important factors for deciding the type and design of drainage system. Since urban expansion is inevitable, increased run off would require remodeling of the existing drains as well as provisions of new/supplementary drains, implementation of appropriate flood protection measures, protection of natural drainage course, improved ground water recharge, and other environmental improvement measures such as prevention of sewer flows into the storm drains, pollution of river Yamuna etc. Provision of

appropriate drainage in marginal settlements consisting of JJ clusters, resettlement colonies, informal/unauthorized colonies, etc, also requires due attention.

Regional Plan-2001 proposed that open drains, which are by and large the sources of nuisance and pollution, should be discouraged and discontinued. Areas where the annual rainfall exceeds 75 cm, separate systems for sewage and storm water are recommended. A combined sewerage system including drainage may be economical if the average annual rainfall is less than 75 cm.

During the review of Regional Plan-2001 in the year 1999, it was observed that nearly 60% towns are partially covered with the storm water drainage system and only two towns are fully covered. In all the cases, drains are open and in some of the towns there is combined system. The disposal of storm water is invariably unplanned and takes natural course on land, depressions, ponds etc.

9.3.2 Existing Situation and Issues

Studies have revealed that there is lack of integrated planning in the drainage for storm water which is not local but has got regional bearing covering areas in Haryana, Rajasthan, U.P. and NCT-Delhi Sub-regions. Untreated sewage continues to flow in most of the drains in the region and ultimately falls into the rivers Ganga and Yamuna. Encroachment by slum dwellers along the drains causes choking of drains and flooding in the upstream areas due to reduced carrying capacity. Dumping of solid waste in the drains also continues causing blockage. Master Plans have not been prepared district wise. Even the hydraulic survey has not been carried out regularly to assess the conditions of the drains.

- ***Lack of Regional Approach***

There is a need to adopt integrated regional approach for drainage planning and critically examine each major drainage system under basins/sub-basins of NCR at micro level by each constituent State Government to assess the deficiencies in planning, design, maintenance and to suggest remedial measures including remodeling/improvement work wherever necessary.

- ***Lack of Funds***

Adequate funds need to be provided by the respective State Governments for upgradation and maintenance of the existing drainage system in the various Sub-regions for the improvement of internal and regional drainage system.

9.3.3 Policies and Proposals

In order to improve the regional and local drainage system in NCR, following strategies and policies are proposed:

- ***Regional Approach to Drainage***

Integrated Regional Drainage Plan at the regional level and Drainage Master Plans at the district level should be prepared after critically examining each major drainage system under basins/sub-basins of NCR at micro level by the State Governments incorporating the improvement proposals for enhancing the quality of regional and local drains taking into account the present/future development and settlement pattern in the region. All the related works at the regional level should be coordinated by a single agency. The area drainage plan should be considered as an integrated part of the Master Plan of the area and this drainage plan shall take into account the land development planning for the region. There is a need to conceptualize a drainage system before any area development programme is taken up. No area development project/new town/colonies/industrial complex should be sanctioned/allowed to be started or implemented unless integrated drainage plan is conceptualized

and cleared by the designated authority. All developments in controlled areas falling in dark and over exploited block declared or to be declared in future by CGWB should aim towards zero run off within in the controlled areas. The ponds/lakes/wetlands (existing and proposed), bunds/check dams etc. should be developed/protected to increase the run off time of storm water in order to help in ground water recharging.

- ***Norms and Standards***

The urban drainage system may be designed for maximum rainfall of five years frequency storm for internal as well as peripheral drains and ten years frequency storm for the main drains. The likely time of concentration for each case may be worked out and corresponding storm values adopted. Usually the system is designed for a maximum rainfall of one-hour duration.

§ The rural drainage system may be designed for three days rainfall of five years frequency to be drained in three days. An appropriate area dispersal factor should be adopted for computing the run off.

§ The coefficient of run off may be calculated for areas with composite land use pattern on the basis of anticipated land use in the new areas and existing land use pattern for the areas already developed.

§ Where it is not possible to work out the run off coefficient due to land use policies not indicated, run off coefficient not less than 0.2 may be adopted for rural areas with flat to moderate slopes and 0.4 for steeper slopes. For urban area, run off coefficient not less than 0.6 may be adopted in absence of adequate details of the areas.

- ***Prevention of Storm Water Drains from Pollution***

Measures should be taken to prevent the use of storm water drains for conveying sewage and dumping of solid wastes and sludge in open drains. Enforcement should be done under the Environment Protection Act, 1986. Unauthorized development/encroachment/slum dwellings in the drainage system should be prohibited.

- ***Irrigation Water***

Where irrigation canal escapes including the tail escapes are out falling in the drains or in the neighboring ponds, the provision for efficient draining of surplus irrigation water by enhancing their capacity should be made during monsoon and on-monsoon period while planning for improvement in the integrated Regional Drainage System.

- ***Provision of Funds***

Provision of adequate funds should be made for upgradation and regular maintenance of the drains on the same lines as for the irrigation channels.

9.3.4 Plan of Action and Phasing of Implementation of Strategies/Policies/Proposals

In order to implement the policies of drainage in the region, it is imperative to have a phase wise plan of action so that the implementation of policies and proposals in the Regional Plan can be dovetailed with the five-year plans. In view of this, each recommendation has been phased plan-wise where certain activities are to be completed within first five-year of the implementation of the Regional Plan whereas some activities will span over to all the four five-year plans.

Some of the activities which need to be implemented include preparation of Integrated Regional Drainage Plan at the regional level and Drainage Master Plans at the District level to manage regional and local

drains, avert mixing of sewage and solid waste in storm water drains, creation of mass awareness, waste minimization through recycling of waste, regular maintenance and upgradation of drains etc. Investment requirement in this sector will depend upon the District Level drainage Master Plans to be prepared by the respective State Governments and the Integrated Regional Drainage Plan, therefore, Investment Plan cannot be proposed in the Regional Plan. Provisions for fund requirement will have to be made by the constituent State Governments in their five-year plans on the basis of District level Drainage Master Plans.

Phased programme and plan of action have been worked out to give effect to the proposal and implementation thereof, which is at Annexure 9/II.

9.4 IRRIGATION

9.4.1 Background

Water requirement for irrigation is closely related to population, demand for food, production of non-food agricultural and industrial items, improvement in quality of life and preservation of ecology and environment. Absence of effective guidelines for conservation of agricultural land and the lack of effective controlling mechanism, (legal and institutional) in constituent States, both at the Sub-regional and local levels have resulted in converting the land use from fertile land to urban use regardless of the NCR Plan.

Regional Plan-2001 did not indicate any specific policies and programmes in this regard.

9.4.2 Issues

Studies have revealed that the requirement of water for irrigation in the region cannot be seen in isolation. The demand for drinking water and industrial use should also be considered.

- ***Insufficient Water Sources in the Region***

The present surface water resources of the NCR are insufficient to meet the requirement of the various sectors. A holistic view of water requirements should be taken including the demand for the drinking water supply, industrial use and irrigation assigning priority to drinking water and industrial use.

Drinking water requirement for the entire NCR in the year 2001 was 6,329 mld (6.329 MCM/day or 2,310.07 MCM/annum) and the projections for the year 2021 are 11,984 mld (11.984 MCM/day or 4,374.27 MCM/annum). There is no estimate available for the ultimate industrial requirement of water up to the year 2021. However, it has been assumed as equivalent to the domestic water requirement.

NCR forms part of the most productive agricultural areas of the country. The region is endowed with extensive fertile land and good irrigation facilities. Assuming that only 60% of the cultivable area is irrigated, the requirement of water for irrigation has been suggested as 14,000 MCM by the study group. Thus, total tentative annual water demand of NCR in the year 2021 for drinking water, industry and agriculture is projected to be 22,748 MCM as mentioned below:

Drinking Water	4,374.27 MCM/annum
Industrial use	4,374.27 MCM/annum
Irrigation	14,000.00 MCM/annum
Total Demand	22,748.54 MCM/annum

This water requirement cannot be met from river Yamuna alone. The average annual water availability of river Yamuna up to Delhi has been assessed at 12,000 MCM. The Ganga basin is also water deficit up to Allahabad. Present canal system of Yamuna, Ganga and Bhakra Beas meet the surface water demand of NCR and NCT-Delhi. The MOU signed on 12th May 1994 by the Chief Ministers of the Co-basin States provides annual allocation of 5,730 MCM to Haryana, 1,119 MCM to Rajasthan, 4,032 MCM to U.P., 378 MCM to Himachal Pradesh and 724 MCM to NCT-Delhi. The agreement takes care of the irrigation and consumptive drinking water needs of all Co-basin States. The MOU also provides for separate agreement to be executed in respect of each storage identified in the Upper Yamuna river basin within the overall allocation made under the agreement.

A part of the demand is also met from ground water. However, entire NCR has been witnessing decline in ground water levels. The decline has been higher in areas underlain by fresh water as compared to areas having marginal to saline ground water. The water levels in Meerut, Bulandshahr and Ghaziabad districts of U.P. had declined by 0.15 to 2.50 metres up to 1995. Similarly, the decline was more pronounced in the areas falling in Rajasthan where water level in Alwar tehsils declined by ten metres, Mandawar Tehsil by nine metres, Kishangarh and Behror Tehsil by seven metres. In the districts of Panipat, Sonapat, Rewari, Rohtak, Faridabad and Gurgaon falling in Haryana State, the decline was of the order of three to seven metres, the decline being more pronounced in Gurgaon, Faridabad and Rewari Districts. The ground water decline in most parts of NCT of Delhi during the decade 1985-1995 had been less than four metres. However, significant decline had been recorded in Central Najafgarh Block, both sides of ridge in southern city block and in the Chhatarpur basin of Mehrauli block. The status of dark and over exploited areas for the ground water is shown in Map 8.2 National Capital Region: Status of Ground Water Availability.

- ***Lack of Ground Water Recharging resulting in the Depletion of Ground Water***

The rate of development of the groundwater resources is unsustainable with most districts of the NCR that are sliding into the dark zone category as discussed in previous paragraph. This is due to lack of ground water recharging, higher rate of withdrawal, fast pace of urbanization and reduction in run off time for rainwater. Thus, recharge of groundwater is a priority.

- ***Sources outside the Region***

Planning and development in NCR, for the existing situation, is based upon the assurance of water supply from the three proposed dams in the Himalayas, for augmenting surface flow. The infrastructure work on these dams is yet to commence. Even if the construction is initiated immediately, these dams would not be ready for use for next 15-20 years, thus jeopardizing the NCR Plan.

9.4.3 Policies and Proposals

The direction of growth in the National Capital Region will depend on the availability of water resources. Demand-supply gap of water is one of the key elements for the growth of the region, which needs to be bridged through various policy interventions and demand management. Following policies are proposed:

- ***Regional and Integrated Approach***

Integrated Water Resource Management Approach for the region is required for optimum water resources utilization and demand management including the demand for irrigation, drinking water and industry. In order to meet the demand of water in the region for various uses such as irrigation, drinking and industry, the region is dependant upon various multi-purpose River Valley/Dam Projects where large storages can be created and long distance transfer of water is done through canals. While the priority should be given to the drinking water and industrial water demand in the region, the

allocation of water for agricultural purposes should also not be discarded. Overall demand of the region should be considered by the Ministry of Water Resources, riparian States and constituent States while signing the MOU for water sharing in consultation with Ministry of Urban Development and Poverty Alleviation. While preparing an over all Integrated Water Resource Management Plan in the Sub-regions, the requirement of water for various purposes, treated sewage effluent and storm water collected through various rainwater harvesting methods should be considered. This should also be incorporated by the States in their Master/Development Plans.

- ***Resources Augmentation, Demand Management and Efficiency in the Use of Water***

Earlier the water used to be developed rather than being managed. With the scarcity of available water, alternative could be proper demand management and efficiency in use of water. It is expected that by the year 2021, there will be additional requirement of 16,748.0 MCM per annum (assuming that only 50% of water from river Yamuna will be made available for NCR out of 12,000 MCM per annum), for which additional water resource has to be created/augmented/existing resource has to be properly managed. Since augmentation of water resources through large dams on the Yamuna and Ganga are likely to take time more than perhaps two decades, as envisaged in the earlier plans, it would be necessary to increase the availability of water by adopting following means:

§ Artificial Recharging and Ground Water Harvesting:

- Artificial recharge through rainwater harvesting in ponds, Yamuna flood plains, paleo-channels, ox-bow channels, construction of small check dams at favorable locations in part of the Ridge for recharge etc.
- Utilizing surplus canal water during monsoon period for recharging the depleted aquifers.
- Roof-top rainwater harvesting should be made mandatory in building bye-laws especially in the over exploited and dark Blocks i.e., the areas with unsustainable ground water resources as identified by CGWB.

§ Demand Management of Water:

- It is expected that the treated waste water from sewerage system in the region would be around 2,423.25 MCM per annum which must be put for agricultural/non-potable use to reduce the overall demand for water for irrigation purposes.
- It is expected that water requirement for industrial purposes by the year 2021 in the region would be 4,374.27 MCM per annum, therefore, it is recommended that water based industries should not be allowed in the region.
- Drip Irrigation method should be promoted in the region to save water from irrigation sector. Even if 25% of the water is saved, it would amount to saving of 3,500 MCM per annum.

Decentralization of authority, responsibility and technical units along with community awareness, participation and monitoring of various aspects is a must for any successful water resource management system.

9.4.4 Plan of Action and Phasing of Implementation of Strategies/Policies/Proposals

In order to implement the policies of irrigation in the region, it is imperative to have a phase wise plan of action so that the implementation of policies and proposals in the Regional Plan can be dovetailed with

the five-year plans. In view of this, each recommendation has been phased plan-wise where certain activities are to be completed within first five-year of the implementation of the Regional Plan whereas some activities will span over to all the four five-year plans.

All the policies need to be implemented immediately. These include Integrated Water Resource Management Approach for the region for optimum water resources utilization and demand management, augmentation of water resources by adopting rainwater harvesting (micro and macro) and recycling/reuse of treated waste water, adopting sprinkler/drip irrigation. Investment Plan cannot be prepared at this stage because it needs micro level planning at the town/district level. Investment Plan will have to be prepared by the constituent State Governments at Sub-regional level.

Phased programme and plan of action has been worked out to give effect to the proposal and implementation thereof, which is at Annexure 9/II.



TELECOMMUNICATIONS

10.1 BACKGROUND

Delhi has a large network of telecom facilities, which is vital for various economic activities and this has helped in concentration of these activities in Delhi in preference to other locations in the region. Likewise, provision of effective and efficient Telecom facilities in the entire NCR holds immense significance in the context of Regional Plan, where the ultimate aim is to promote growth and balanced development in the entire region. Thus, it would be necessary to extend similar telecom services in the region.

During the past ten years or so, large-scale developmental and technological changes have taken place, particularly in the telecommunication sector. This contributed to rise in the living standard of the people, awareness of its importance and personal conveniences. Thus, a rapid increase in demand for telephones has been generated in Metro centres, Regional centres and other smaller towns and villages in NCR.

Regional Plan-2001 and its Functional Plan for Telecommunication proposed uniform local call system in CNCR towns in the first phase and in the rest of NCR area in the second phase. The Plan also envisaged provision of single STD code for whole of NCR including NCT-Delhi and telephone on demand by 1997.

Review of the Regional Plan-2001 undertaken in the year 1999 emphasized the need to bridge the gap between demand and supply of telephones in the region and to upgrade all the remaining electro-mechanical telephone exchanges to electro-digital exchanges and connect the same with modern transmission media such as optical fiber cables etc.

10.2 EXISTING STATUS

Over the last few years, significant improvement has been made in terms of capacity and technology upgradation to keep pace with the changing trends. The region has been covered with uniform local call system (direct dialing) with 95 level but with differential pulse rate depending upon the distance. This facility is available only for Delhi and intra-state. It has not been made available on inter-state basis. The Ministry of Communications and Information Technology informed that single STD code was not possible for the whole region due to technical/administrative problems. They also informed that the goal for providing telephones on demand in the entire region could not be achieved due to higher growth of demand than expected and penetration of telecom services up to the village level on a large scale.

As per the status provided by the Ministry of Communications and Information Technology, the switch capacity in NCR has increased from 9,95,248 on 31.07.2001 to 14,11,650 on 30.08.2003. Similarly, the capacity of Direct Extension Lines (DEL) has increased from 8,46,628 to 18,88,067 and Wait List (WL) has reduced from 34,912 to 10,411 during the same period. Details of the same are given in Annexure 10/I. Various value added services, relevant to growth, like pagers, cellular, digital network and internet are available in most of the region. Data Internet Services are yet to be provided in some of the Haryana

towns like Ballabhgarh, Bahadurgarh, Palwal, Panipat, Dharuhera, Rewari etc. Details are given in Annexure 10/II.

The Ministry of Communications and Information Technology has spent Rs. 3,301.70 crores during 9th Plan for upgradation of telecom services in the region. Sub-region wise details are given in the following Table 10.1.

Table 10.1: Expenditure during 9th Plan in NCR

Sub-region	Expenditure (Rs. in Crores)
1	2
NCT-Delhi	2,294.85
Haryana	473.07
Rajasthan	100.92
Uttar Pradesh	432.86
Total NCR	3,301.70

10.3 ISSUES

Some of the issues emerging from the existing scenario include:

- i) The Department of Telecommunication (DoT) has expressed inability to extend the MTNL boundary to entire NCR and also in providing single STD code to the entire region because of administrative and operational reasons.
- ii) Since DoT is still operating on the basis of States, as the administrative jurisdiction of their circles, the local dialing facility on the regional basis is not available and inter Sub-regional dialing (i.e., between Haryana, Rajasthan and U.P. Sub-regions) is still through STD.
- iii) The goal of providing telephones on demand in the entire region is yet to be achieved. It is because of higher rate of demand than expected and penetration of telecom services up to village level on a large-scale.

10.4 POLICIES AND PROPOSALS

In order to improve the Telecom facilities in the region by the year 2021, following strategies and policies are proposed:

- i) Make available telephone on demand and sustain it thereafter so as to achieve a tele-density of 11.5 in urban areas and 3.0 for rural areas by March 2007.
- ii) Service providers (private sector and BSNL/MTNL) should be allowed to have a common inter-linked system of basic services for the entire NCR treating it as a single telecom circle and should be encouraged to supplement the efforts of DoT in achieving the goals. Further, efficient telecommunication system will reduce number of trips and load on the transport corridors.
- iii) Constituent States should provide land, building and other facilities to the telecom service providers for setting up of telephone exchange and other installations.

- iv) provide high-speed data and multimedia capability using technologies including ISDN to all towns with a population of more than two lakhs.
- v) DoT should promote tele-conferencing, net-meeting, internet protocol telephone, wireless LAN services etc. within the region at par with NCT-Delhi. The technologies such as General Packet Radio System (GPRS); Blue Tooth Technology; Architecture for Voice, Video and Integrated Data Technology (AVVID), etc. should also be promoted. A brief description of these technologies is highlighted in the following boxes:

Box 10.1

GENERAL PACKET RADIO SYSTEM

General Packet Radio System (GPRS) is a new service that provides actual packet radio access for mobile Global System for Mobile Communications (GSM) and time-division multiple access (TDMA) users. The main benefit of GPRS is that it reserves radio resources only when there is data to be sent and it reduces reliance on traditional circuit-switched network elements. The increased functionality of GPRS will decrease the incremental cost to provide data services, that will, in turn, increase the penetration of data services among consumer and business users. GPRS is important step toward third-generation (3G) networks. GPRS will allow network operators to implement IP-based core architecture for data applications, which will continue to be used and expanded upon for 3G services for integrated voice and data applications.

Box 10.2

BLUE TOOTH TECHNOLOGY

Telecom technology compatible with Blue Tooth is a Radio Frequency (RF) specification for short-range, point-to-multi-point voice and data transfer. Bluetooth will enable users to connect to a wide range of computing and telecommunications devices without the need for proprietary cables that often fall short in terms of ease-of-use. The technology represents an opportunity for the industry to deliver wireless solutions that are ubiquitous across a broad range of devices. Bluetooth technology was designed to be small and inexpensive. Bluetooth technology has no line-of-sight requirements making it a potential replacement for infra-red ports. Bluetooth can operate through walls or from within your briefcase. Printers, PDA's, desktop computers, fax machines, keyboards, joysticks and many other digital devices can be part of the Bluetooth system. Bluetooth radio technology provides a universal bridge to existing data networks, a peripheral interface, and a mechanism to form small private and ad-hoc groupings of connected devices away from fixed network infrastructures.

Box 10.3

AVVID TECHNOLOGY

Telecom facility compatible to AVVID Technology (Architecture for Voice, Video and Integrated Data) defines a framework for building and evolving customer networks supporting internet business solutions. As more and different applications begin sharing the data network, the needs for management, reliability, and control grow. Unlike traditional hierarchical network architectures, such as SNA, the emerging network model is widely distributed so that servers anywhere in the network provide information and processing services to users regardless of location. Adequately serving the needs of Internet business solutions in this environment requires a consistent set of network services end-to-end through the network, providing prioritization, high availability, and performance. Since a level physical foundation provides the reference point and support for a complex physical building, these consistent services provide a foundation for rapid deployment and easy administration of internet business solutions.

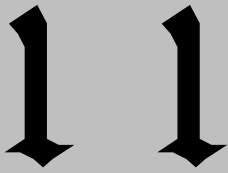
- vi) Reliable media should be provided through adequate band-width, convergence of technology for voice, data and video, and connectivity through OFC up to the last mile. The rural exchanges should be synchronized to enable data transmission in a time bound programme.
- vii) All the villages in the region should be covered with telecom facilities. Telecommunications services in rural areas should be made more affordable by providing suitable tariff structure and making rural communications mandatory for all fixed service providers.
- viii) Use of non-conventional sources of energy for rural communication should be encouraged in coordination with the Ministry of Non-conventional of Energy Sources and concerned State

Governments, as the availability of dependable power supply is a major problem in running telecommunications services in rural areas.

- ix) Integration of the telecommunication service network with power distribution network should be explored wherever it is technically feasible and commercially viable.

10.5 FINANCIAL IMPLICATIONS

The Ministry of Communications and Information Technology has proposed to achieve the tele-density of 11.5 i.e., 11.5 telephone connections per 100 persons in urban areas and three telephone connections per 100 persons in rural areas in the 10th Plan period. Accordingly, the requirement of new connections in Metro and Regional Centres has been calculated on the basis of existing telephone connections given under respective telephone exchanges and population of the town in the year 2001. The coverage of telephone exchanges extends beyond the urban limit also and thereby outskirts colonies are also covered by these telephone exchanges, whereas the projected population is taken for the town only. Besides, mobile phones are also in extensive use. These connections are not included in estimating the existing as well as the proposed tele-density. The requirement of funds is a rough estimate for making Sub-component Plan for Communications and Information Technology. Details are given in Annexure 10/III. As per the estimates of the Ministry of Communication and Information Technology, Rs.1,153 crores will be required to achieve the tele-density target in the NCR towns.



SHELTER

11.1 BACKGROUND

Housing activities are known to have the capacity to play a significant role in socio-economic development of a region because they help in not only the creation of 'shelter' for the people but also in generating employment opportunities for a large variety of skilled and unskilled workforce, which is a prerequisite for growth and development of settlements.

In the context of the Regional Plan policy of 'induced growth' of selected settlements in the National Capital Region, evidently large scale housing activities are essential elements of the overall development programme to help them absorb population and economic activities, thus helping in reducing population pressure on Delhi and achieving balanced development of the entire region.

A number of public agencies-area development authorities, state housing boards, local bodies, etc. are involved in the delivery of both developed plots and built-up dwelling units. Many public sector undertakings and Central Government agencies also construct houses for their employees as staff quarters. Besides these, cooperative societies are also active participants in housing production. Private sector entrepreneurs who develop plots and construct flats are comparatively new entrants in this sector and their operation is largely confined to towns nearer Delhi.

The efforts by these organized institutional agencies is no match for individuals/households who help in the creation of a much larger number of units, constructing new houses or converting old units through repairs/renovations, additions/alterations etc. In fact the region outside the metropolis today largely depends on individual effort to build houses.

11.2 ISSUES

Shelter in the region is generally inadequate, especially in the Priority Towns. A review of the shelter scenario, as part of the review exercise of Regional Plan-2001, shows that the Priority Towns (targeted for accelerated development to absorb additional population) suffer from various forms of housing deficiencies. About 15-20% of the housing stock is dilapidated, either they are *kutcha* units made of non-durable materials or without access to drinking water, toilet and lighting facilities etc. Besides this, overcrowding and congestion are common. It was estimated that Priority Towns in NCR would need a supply of about 6.25 lakh dwelling units by 2001 (0.50 lakh for removing the current shortage, 1.75 lakh to cater to the normal population increase and 4.00 lakh for absorbing the additional population proposed to be deflected to these towns).

It was also observed that public sector agencies like the housing boards, development authorities etc. had not been able to deliver the requisite number of housing units and, therefore, the housing problem was accentuating. Slums and squatter settlements were increasing.

11.3 STRATEGIES

One of the factors which has impaired the housing supply in NCR towns is their slow pace of development. These towns have also been rather slow in coming up with the requisite level of infrastructure support, a prerequisite for the fast development. The strategy of induced development in these towns may have to be looked upon afresh in the light of past experience and decisions may have to be taken in the form of package for each of the selected settlements, which would act as the much needed catalyst for accelerating the growth of these towns. The housing deficit/demand is intrinsically linked to various local factors such as potential of the area, economy, affordability etc. the State Government/local agencies need to work out the housing requirements and prepare phased programmes taking into account these factors so as to meet the demand.

The SCOPE, CPWD, DDA etc., which are involved in developing office complexes, should have joint ventures with their counterpart development agencies/authorities in the towns of NCR viz., GDA, NOIDA, Greater NOIDA, UPHB, HUDA etc. for creation of new office complexes especially in the Central NCR towns. The Central Government and its agencies can create the facility of General Pool Accommodation in the Central NCR towns for supporting these complexes as well as housing government employees of NCT-Delhi. These complexes should also have provisions for essential facilities such as CGHS, Kendriya Bhandars, Kendriya Vidyalayas and dedicated transport services linking them with the work centres/office complexes in NCT-Delhi.

Cooperative effort has been accepted universally as an effective mechanism for satisfying the housing needs of the people, especially, since it helps in the production of a considerably large number of dwelling units at comparatively lower costs. It would, therefore, be appropriate to encourage the efforts being made by the Cooperatives to supplement the efforts of individuals/households in creating adequate housing stock. The private sector, community based organizations (CBOs), non-governmental organizations (NGOs) and self help groups (SHGs) should be involved in slum development and upgradation activities.

As envisaged in the National Housing and Habitat Policy, 1998, public agencies should perform the role of facilitators by providing developed land and legal & infrastructure support to enable the private sector to make heavy investments in housing (refer Box 11.1).

<p>Box 11.1</p> <p style="text-align: center;">NATIONAL HOUSING AND HABITAT POLICY 1998 <i>Salient Features</i></p> <p>Objectives</p> <ul style="list-style-type: none">• Creation of surpluses in housing stock either on rental or ownership basis• Providing quality and cost effective shelter options, especially to vulnerable groups and the poor• Removing legal, financial and administrative barriers for facilitating access to land, finance and technology• Forging strong partnership between private, public and cooperative sectors to enhance the capacity of the construction industry to participate in every sphere of housing and habitat• Using technology for modernising the housing sector to increase efficiency, productivity, energy efficiency and quality• Empowering Panchayati Raj institutions and village cooperatives to mobilise credit for adding to the housing stock <p>Role of all the Stake Holders</p> <p><u>Central Government</u></p> <p>The Central Government's role in implementing the Policy is to take steps to bring in legal reforms including formulation of effective foreclosure laws. Further, it has to devise macro economic policies to enable flow of resources to the housing and infrastructure sector, develop a debt market for housing and infrastructure fully integrated with the financial markets in the country. For this purpose the Government has to set up a National Shelter Fund to meet the requirement of low cost funds for the housing needs of the poor. It is also required to promote research and development and transfer of technology for construction of houses and evolve parameters for optimal use of available resources to promote development and growth in a</p>
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sustained manner.

The housing policy recognises the necessity of providing fiscal concessions for housing, infrastructure, innovative and energy saving construction materials and methods and also setting up a regulatory mechanism to ensure that the concessions are correctly targeted and utilised.

The Central Government is also required to develop and enforce appropriate ecological standards to protect the environment and provide a better quality of life in human settlements. It should also promote the creation of a secondary mortgage market.

State Governments

The State Governments are required to liberalise the legal and regulatory regime to give a boost to housing and supporting infrastructure, promote private sector and cooperatives in undertaking housing construction for all segments in urban and rural areas. They are also required to undertake appropriate reforms for easy access to land and promote decentralised production and availability of building material.

The State Governments have to facilitate training of construction workers by converging other development programmes through Building Centres and other agencies. Besides they are to empower the local bodies to discharge their responsibilities in regulatory and development functions.

Local Authorities

The role of local authorities is to identify specific housing shortages and prepare District Housing Action Plans for rural areas, devise programmes to meet housing shortages and augment supply of land for housing, particularly for vulnerable groups and plan expansion of both urban and rural infrastructure services. They are also required to enforce effectively regulatory measures for planned development.

Public/Private Housing Finance Companies

The policy anticipates that the public/private housing finance companies will redefine their role and move away from the traditional approach to housing finance and develop and expand their reach to meet the needs of people. Besides this they may have to devise schemes to lend at affordable rates to those who are in dire need of housing finance support, mobilise resources from provident funds, insurance funds, mutual funds etc. for house building activities and develop innovative instruments to mobilise domestic savings.

Housing Boards/Corporations/Development Authorities and Other Public Agencies

The policy envisages that Housing Boards and other agencies involved in housing development will revamp their method of working and redefine their role for facilitating land assembly and development of infrastructure, moving away from direct construction activity. For achieving their objectives they will have to forge partnerships with the private sector and cooperatives for housing construction in an efficient manner and devise flexible schemes to meet the user's requirement.

Corporate, Private and Cooperative Sectors

The policy accords a very high importance to corporate, private and cooperative sectors in housing delivery. They are expected to take the lead role in land assembly, construction of houses and development of amenities. In the endeavour they should forge partnership with State Governments and local authorities for construction of houses and collaborate with the State Governments to work out schemes for slum reconstruction on cross subsidization basis.

Research and Technology Transfer Organisations

These institutions are required to direct research efforts to locally available raw materials and reduce the use of scarce natural resources and replace them with renewable resources. They may also have to standardise new technology for easy adoption by various public and private construction agencies and also promote energy efficiency in building materials and construction methods. This will also entail promoting use of renewable energy sources for the housing sector particularly, solar, bio-mass and waste based energy.

It is also necessary for them to promote disaster mitigation techniques for new constructions as well as strengthening of existing houses to prevent continuing loss of housing stock and human lives from natural hazards like earthquakes, cyclones and floods.

One of their important role is to disseminate information about new technologies and provide training to construction workers in the use of new technologies.

Cost-effective construction techniques involving local materials and innovative housing designs should be extensively propagated to make the housing units not only cheaper and durable, but also energy-efficient, aesthetically pleasing, functionally fulfilling and environment-friendly.

Innovative concepts like ‘work-cum-shelter’, ‘incremental housing’ etc. should be adopted to cater to the specific needs of individual household thereby effecting savings as well as opportunity costs.

Access to convenient housing finance for all segments of the population should become a reality through financing institutions, liberalised credit terms and mortgage requirements.

11.4 SLUMS/INFORMAL SECTOR HOUSING

Because of acute shortage of affordable shelter, many of the migrants tend to encroach city space and squat on all forms of land, be they reserved for public utilities and services, commercial and office complexes, play grounds, parks etc. Such unauthorized squatter settlements, bereft of basic amenities, are not only over-crowded and unhygienic but also prone to various environment hazards.

An attempt was made for the first time during the Census 2001 to collect detailed data about slum areas of the country particularly in cities/towns having a population of 50,000 or more based on Census 1991. All the inhabitants of the areas, which have been notified as slums by the State Government under any legal provision or recognized by them as such, have been accordingly considered as slum population for this purpose. Besides areas in cities/towns, which satisfy, the usual criteria for declaring an area as slum have also been included.

For the purpose of Census 2001, slum areas broadly constitute:

- i) All specified areas notified as ‘Slum’ by State/Local Government and UT Administration under any Act.
- ii) All areas recognized as ‘Slum’ by State/Local Government and UT Administration, which may not have been formally notified as slum under any Act.
- iii) A compact area of at least 300 population or about 60-70 households of poorly built congested tenements, in unhygienic environment usually with inadequate infrastructure and lacking in proper sanitary and drinking water facilities.

The situation obtaining from this information for the four largest metropolitan cities and the NCR is shown in Boxes 11.2 and 11.3.

Box 11.2			
SLUM POPULATION			
<i>(in Four Largest Metropolitan Cities of India, 2001)</i>			
Name of City	Total Population	Slum Population	% of Population in Slums
Greater Mumbai	1,19,14,398	58,23,510	48.88
Delhi Municipal Corporation (Urban)	98,17,439	18,54,685	18.89
Kolkata	45,80,544	14,90,811	32.55
Bangalore	42,92,223	3,45,200	8.04

Note: Data pertains to Municipal Corporations.

Delhi continues to face the problem of mushrooming growth of Jhuggi-Jhomprri (JJ) Clusters on land pockets belonging to various land owning agencies i.e., DDA, MCD, NDMC, Delhi Cantonment Board, Railways, Government Departments, CPWD, L&DO, Departments of Delhi Government and other autonomous organisations.

Box 11.3					
SLUM POPULATION IN NCR (2001)					
Sub-region/Cities	Population		%age of Slum population	Sex Ratio	Literacy Rate
	Total	Slum			
NCT-Delhi (MC-Urban)	98,17,439	18,54,685	18.89	825	48.17
Haryana (Urban)	61,14,139	14,21,839	23.25	824	73.91
1. Panipat	2,68,823	1,02,813	38.25	798	72.14
2. Sonapat	2,25,151	75,454	33.51	853	78.47
3. Rohtak	2,94,537	90,645	30.78	871	78.04
4. Bahadurgarh	1,26,746	39,478	30.90	820	79.12
5. Rewari	1,00,946	51,754	51.27	862	81.42
6. Gurgaon	2,01,759	33,570	16.64	815	82.68
7. Faridabad (MC)	10,54,981	4,91,131	46.55	796	74.26
8. Palwal	1,00,528	15,589	15.50	859	60.67
Rajasthan (Urban)	1,32,05,444	12,06,123	9.13	900	66.19
1. Alwar	2,60,245	15,923	6.11	883	58.36
Uttar Pradesh(Urban)	3,45,12,629	43,99,005	12.75	859	54.68
1. Meerut	10,74,229	4,71,316	43.87	867	52.06
2. Ghaziabad	9,68,521	2,58,834	26.72	863	61.42
3. Hapur	2,11,987	90,964	42.91	876	49.55
4. Bulandshahr	1,76,256	50,292	28.53	837	55.96
5. Modinagar	1,12,918	33,103	29.31	816	63.54
6. NOIDA	2,93,908	26,824	9.12	812	60.24

Source: Census 2001, Census of India

The migrants come to Delhi in search of gainful employment opportunities, which are easily available in unorganised and informal segments of the metropolitan economy. Delhi started witnessing the problem of jhuggies- jhompri from the early sixties onwards. The huge influx of population from all parts of the country resulted in proliferation of JJ clusters/squatter settlements.

Box 11.4		
SLUM AND JJ CLUSTERS IN DELHI		
S. No.	Item	Position as on 31.03.1999
1.	Number of JJ Clusters	1,080
2.	Number of Basti Vikas Kendras	192
3.	Number of Shishu Vatikas	199
4.	Number of Jan Suvidha Complexes	
	i) Pucca	292
	ii) Prefab	131
	iii) Mobile Toilet Vans	101
	Total	524
5.	W.C. seats of JSCs	
	i) Pucca	11,290
	ii) Prefab	3,496
	iii) Mobile Toilet Vans	1,414
	Total	16,200
6.	Number of Plots developed for relocation of JJ Squatters	13,000
7.	Number of plots allotted to JJ Squatters	11,097
8.	Number of Night Shelters	19
9.	Number of Katras	309
10.	Number of plots developed under In-situ-upgradation of JJ Clusters	5,022

Source: Socio Economic Profile of Delhi 2001-2002, Planning Department, GNCT of Delhi.

Most migrants are unskilled construction workers, low wage earners in small-scale industrial activities, petty traders and community service personnel etc. who may not be able to move out to far-away location, where they do not have any assured source of earning. They are often reluctant to shift from their more convenient central locations within the city to outlying areas away from their places of employment due to the distance involved and the extra transportation expense, etc. Since these migrants have their roots

somewhere else, either at the place of the last residence or place of birth, they are very often reluctant to invest in formal housing and resort to squatting. In this situation, there is a need to provide them sites with bare minimum facilities within their affordability limits. The facilities at such sites could be gradually upgraded on incremental basis.

Studies have revealed that settlers in these JJ clusters are pursuing various informal economic activities making significant contribution to the city's economy and over a period, have established an inter-dependent relationship with the formal commercial, industrial and manufacturing functions in the city. From domestic help and unskilled factory jobs to semi-skilled and manual work, they are now an essential requirement of the city's daily life. The cheap labour that they provide, the large numbers of domestic help and service personnel that they consist of, and the sizable informal functions they perform, make them significant partners in Delhi's life and existence.

The broad policy adopted in Delhi is that no fresh encroachments shall be permitted on public land and past encroachments, which had been in existence prior to 31st January 1990, will not be removed without providing alternatives. A three-pronged strategy has been adopted for dealing with the problems of jhuggi-jhompri as under:

- i) Relocation of those jhuggi households where the land owning agencies are in a position to implement projects on the encroached land pockets as per requirements in larger public interest, and they submit requests to Slum and JJ Department for clearance of the jhuggi cluster for project implementation and also contribute due share towards the resettlement cost.
- ii) In-situ upgradation of JJ Clusters and informal shelters in case of those encroached land pockets where the land owning agencies issue NOC to S&JJ Department for utilisation of land. However, the utilisation of land under this strategy is linked with the clearance of the project by the Technical Committee of the DDA.
- iii) Extension of minimum basic civic amenities for community use under the scheme of Environmental Improvement in JJ Clusters and its component scheme of construction of Pay and Use 'Jansuvidha Complexes' containing toilets and bathrooms and also introduction of mobile toilet vans in the clusters irrespective of the status of the encroached land till their coverage under one of the aforesaid two strategies.

In view of the enormity of the problem of slums in cities/towns at the national level, the Ministry of UD&PA has framed draft 'National Slum Policy' (refer Box 11.5). This policy will go a long way in solving this gigantic problem.

The concept of 'holding areas' should be incorporated in the Master/Development Plans of the cities/towns in the NCR to be prepared by the State Governments. Such areas would be dedicated for temporary settlement of migratory influx for a specified period of time, enabling them to economically and physically integrate with the formally developed areas. This is likely to check the growth of slums and unauthorised colonies in the towns/cities.

Relocation/resettlement efforts in the past either failed or had only limited success mainly because many newly located sites deprived the residents of the much needed job opportunities. In this context, it has also been suggested time and again that the possibility of solving the problem of slums in Delhi should be explored in the regional context.

Box 11.5**NATIONAL SLUM POLICY***Salient Features***Objectives**

- To integrate slum settlements and the communities residing within them into the urban area as a whole by creating awareness amongst the public and in Government of the underlying principles that guide the process of slum development and improvement and the options that are available for bringing about the integration.
- To strengthen the legal and policy framework to facilitate the process of slum development and improvement on a sustainable basis.
- To establish a framework for involving all stakeholders for the efficient and smooth implementation of policy objectives.

Salient features

The policy primarily endorses and promotes an upgrading and improvement approach to deal with slums and informal settlements as opposed to resettlement. It proposes that all existing planning instruments such as master plans, landuse plans etc. should be modified to ensure that slums and informal settlements can be properly integrated into the wider urban area.

The policy states that all physical upgrading and improvement in informal settlements should adopt a community-based approach with the active involvement of members of the community at every stage of design, implementation, and maintenance of services and assets. It sets forth specific norms and guiding principles for physical infrastructure developments and the desirability of collection of user charges.

The policy also emphasises improving access to social services-health, education, child labour and child rights and public distribution system-as their effective delivery would also reduce social inequities and promote integration of people residing in slums into the social and economic networks of the city as a whole.

The policy recognises the importance of economic empowerment of the slum dweller and lays guidelines for provision of financial services for the poor and economic support/enterprise development designed to address the livelihood needs of the urban poor.

The policy proposes a sustainable financing mechanism for slum improvement through a Slum Development Fund at the State level, while recognising the role of private sector funding and institutional finance.

The policy proposes a Consolidated Service Tax on properties located in slums. It gives measures for strengthening municipal governance and management in the context of slum areas. It also proposes establishment of a system of monitoring and evaluation at different levels of government in order to find out the extent to which the programmes under the policy are being implemented and whether the policy objectives are being achieved.

The policy is committed to a shelter up-gradation approach that will enable, support and extend individual and community initiatives for housing provision.

Incorporating some of the important features outlined in the policy, the Central Government has announced the 'Valmiki Ambedkar Malin Basti Awas Yojana (VAMBAY)' for construction of dwelling units, upgradation of slum tenements and provision of basic amenities like water supply and sanitation in slums.

Source: National Slum Policy (Draft), Ministry of Urban Development and Poverty Alleviation, October 2001.

The NCR Planning Board is providing financial assistance to the State Governments for several development programmes in various sectors such as residential, commercial, industrial and infrastructure schemes. Most of these programmes have a strong employment content besides the provision of concomitant infrastructure including housing.

A joint approach with active cooperation between DDA, GNCT-Delhi and the development authorities of the towns in NCR (i.e., HUDA, GDA, MDA, NOIDA, etc.) should be adopted wherein NCT-Delhi could consider entering into necessary agreements/joint ventures with them for:

- i) purchasing the existing vacant EWS plots and flats available for immediate occupancy in these towns; and /or
- ii) investing in fresh development of such facilities in these towns for resettlement and taking full advantage of the Government of India's (MOUD&PA) innovative schemes like VAMBAY etc. in establishing housing colonies for the poor and needy.

In either case, these settlers would have to be relocated preferably close to their work places, on the rail, road transport corridors with the fast commuting transportation system.

12

SOCIAL INFRASTRUCTURE

12.1 BACKGROUND

Social infrastructure has been recognized as a growth-stimulating and sustaining route in planning. The effectiveness of social infrastructure in achieving the objectives of NCR would depend upon its capacity to contribute to:

- (i) Population absorbing capacity of the towns.
- (ii) Improvement in the quality of life.
- (iii) Enhanced self-dependency and city's sustainability.
- (iv) Creation of livable and inclusive urban settlements through reducing the sense of alienation among the residents, where social and economic benefits also accrue to the marginalised groups (the poor, women, children, handicapped, etc. among others), with less dependence on big settlements for basic infrastructure.
- (v) Promotion of a sense of belonging with the town, that seems to be lacking due to inadequate provision and non-upgradation of social infrastructure.

The need is to focus on a few components that are likely to have a significant multiplier impact on the growth process in NCR. The social infrastructure components that have the potential to contribute to the development of effective population absorbing capacity of the town include, apart from the conventional components of health and education infrastructure, recreation facilities and open spaces, effective operational Public Distribution Scheme (PDS), crime management infrastructure, and senior citizen homes.

There is a definite need for adoption of a normative approach for deciding the regional level facilities, with adequate weightage to demand side aspects. Accordingly, multiple stage norms and standards might be considered, linked to the 'willingness to pay' principle, with the norms for the rich areas being different from the general norms. The Urban Development Plan Formulation and Implementation Guidelines issued by MOUD&PA, in this regard, are given at Box 12.1.

The principle of equity would require that the needs of the poor should not be overlooked and the purpose of flexible norms should be to generate resources to develop the specific social infrastructure and if required, finance a cross subsidy activity from outside the government exchequer.

Regional or State standards for social infrastructure should be developed for the key social infrastructure components instead of Delhi or national standards, which may be unaffordable and irrelevant within the small towns in NCR.

Box 12.1**UDPFI GUIDELINES****I. Educational Facilities****Norms and Standards****A. Pre-Primary to Secondary Education**

- | | |
|---|------------------------------------|
| a. Pre-Primary, Nursery School | One for 2,500 population |
| b. Primary School (Class I to V) | One for 5,000 population |
| c. Senior Secondary School (VI to XII) | One for 7,500 population |
| d. Integrated school with hostel facility (Class I to XII) | One for 90,000-one lakh population |
| e. Integrated school without hostel facility (Class I to XII) | One for 90,000-one lakh population |
| f. School for handicapped | One for 45,000 population |

B. Higher Education - General

- | | |
|------------------------|--|
| a. College | One for 1.25 lakhs population |
| b. Technical Education | Technical Education Centre (A): One such centre provided for every 10 lakhs population to include one industrial training institute and one polytechnic

Technical centre (B): One provided for 10 lakhs population to include one industrial training institute, one technical centre and one coaching centre |

II. Health Care Facilities

- | | |
|---|--|
| a. General hospital | One Hospital for 2.5 lakhs population with provision for 500 beds |
| b. Intermediate hospital (Category A) | One Hospital for one lakh population with provision for 100 beds |
| c. Intermediate hospital (Category B) | One Hospital for one lakh population with provision for 80 beds (initially may be for 50 with 20 maternity beds) |
| d. Polyclinic with some observation beds | One for one lakh population |
| e. Nursing home, child welfare and maternity centre | One for 0.45 to one lakh population |

III. Socio-Cultural Facilities

- | | |
|------------------------------------|-----------------------------|
| a. Community room | One for 5,000 population |
| b. Community hall and library | One for 15,000 population |
| c. Recreational club | One for one lakh population |
| d. Music, dance and drama centre | One for one lakh population |
| e. Meditation and spiritual centre | One for one lakh population |
| f. Socio-cultural centre | One for 10 lakhs population |

IV. Distribution Services

- | | |
|----------------------|---|
| a. Milk Distribution | One milk booth for 5,000 population |
| b. LPG Godown | One gas Godown for 40-50,000 population |

V. Police

- | | |
|----------------------------------|---|
| a. Police Station | One for 90,000 population |
| b. Police Post | One for 0.4 to 0.5 lakh population (not served by a police station) |
| c. District Office and Battalion | One for 10 lakhs population |
| d. Police Line | One for 20 lakhs population |
| e. District Jail | One for 20 lakhs population |
| f. Civil Defence and Home Guards | One for 10 lakhs population |

VI. Fire

- | | |
|----------------------------------|---|
| a. Fire Station/Sub-fire station | One within 1 to 3 km for 2 lakhs population |
|----------------------------------|---|

Source: Urban Development Plans and Implementation Guidelines (UDPFI), MOUD&PA, Government of India, New Delhi 1996.

12.2 EDUCATION

According to the Census 2001, the literacy rate in the region (72.97%) is higher than that of all India (65.38%). When compared among the Sub-regions, NCT-Delhi (81.82%) has the highest literacy rate followed by Haryana (70.84%), Uttar Pradesh (66.29%) and Rajasthan (62.48%) Sub-regions.

12.2.1 Issues

In NCR, Delhi, the mother city, has almost all types of higher educational and research facilities, perhaps the best available in the country. The educational facilities at sub-regional level, such as colleges, professional institutions or university campuses are required to meet the demands of a large cross-section of the student population. The Uttar Pradesh Sub-region has one university at Meerut and so also Haryana Sub-region at Rohtak, the Rajasthan Sub-region has no university. The number of affiliated colleges for higher and technical education is, however, considerable and also increasing. The process of involving private sector in providing good quality educational facilities has been initiated in some of the Central NCR and Regional Centres. These facilities are also being used by people from Delhi due to cost and proximity considerations.

Box 12.2	
EDUCATIONAL INSTITUTIONS IN DELHI	
Number of Schools	4,618
a) Primary Schools (including Nursery)	2,406
b) Middle Schools	666
b) Secondary Schools	405
c) Senior Secondary Schools	1,141
Higher Education	
Universities	5
Institutions deemed as Universities	6
Colleges	103
a) Funded by Delhi Government	12
b) Funded by Delhi Government and UGC	16
c) Others	75
Technical Education	
Colleges for Technical Education (Engineering)	5
Poly-technics	9
Industrial Training Institutes (ITIs)	15
Basic Training Centre	6

Source: Socio Economic Profile of Delhi, 2001-2002, Planning Department, Government of NCT of Delhi.

General perception is that the quality of higher and technical education outside Delhi is rather poor, at least in comparative terms. There are, however, other factors as well which could or should not be ignored, including availability of international experience in the form of journals, visitors, students, conferences, seminars, etc. which are all found only in Delhi.

The R&D apparatus of the region is almost entirely concentrated in Delhi, though the two universities do have lots of research scholars and research fellowships. The R&D sub-system also generates new knowledge which is particularly relevant for post-graduate education and research for which Delhi is rightly well known.

12.3 HEALTH

12.3.1 Issues

Delhi being the national Capital and the 3rd largest city of India, has the advantage of possessing large number of medical institutions with the best specialisations in almost all the fields available in the country (Box 12.3). The region lacks in equivalent medical facilities though it has government medical colleges in Rohtak and Meerut. The number of beds attached to the medical colleges is not very high and the number of referral beds is rather small.

Super speciality training and treatment is hardly available anywhere in the region with the result that difficult patients are regularly transported to Delhi's referral hospitals even from a distance of 100-200 kms. Obviously this is neither good for the patients nor for Delhi whose physical infrastructure namely transportation and electricity is further strained by such demands from difficult or critical patients. Since many facilities in Delhi have an all India character, they are not obviously meant for the residents of Delhi alone but for the entire country.

Box 12.3		
HOSPITALS IN DELHI		
Hospitals	Nos.	Beds
i) Allopathic	79	20,396
ii) Ayurvedic	6	401
iii) Unani	1	70
iv) Homoeopathic	2	200
Total	88	21,067
Dispensaries/Health Centres		
i) Allopathic	516	-
ii) Ayurvedic	149	-
iii) Unani	22	-
iv) Homoeopathic	108	-
Total	795	-
Primary Health Centres	8	79
Sub Centres attached to PHC'S	42	-
Maternity Homes/Maternity & Child Centres/Sub-Centres	202	285
Poly Clinics	32	-
Special Clinics (TB/STD/Leprosy)	17	186
Private Nursing Homes/Clinics	420	11,000
Bed population ratio (per thousand)		2.34
Family Welfare Centres		121

Source: Socio Economic Profile of Delhi, 2001-2002, Planning Department, Government of NCT of Delhi.

12.4 STRATEGIES

Education and Health

- There is a need to adopt integrated approach for the entire NCR in social infrastructure development to avoid the problems arising out of disparities in standards of these facilities and the jurisdiction.
- The solution to the problem lies in making provision for quality education and medical facilities in the towns falling outside Delhi in NCR. If good institutions are established in the surrounding areas, the people would definitely like to move out of Delhi, thus helping in decongestion of Delhi.

- Considering the popularity of integrated medicine and indigenous systems of medicine in Delhi and NCR, culture-based health facilities system like Ayurvedic, Unani, Homeopathy, Naturopathy, Yoga and Meditation should be strengthened and augmented to provide low cost and locally accessible health care. It would be desirable to identify suitable locations for one to two specialised centres for each of the indigenous systems within the Regional Centres and Central NCR towns and their rural hinterland and develop them into centres of excellence during the Regional Plan-2021.
- The reforms in the social sector are at their infancy and hence any assessment at this stage may not be very realistic. World over the consensus now is that adjustment should have a human face, that social services, particularly those catering to basic needs, should be protected during the adjustment process. In this context, in fact, there exists a strong case for enhancing investment in education as a concomitant of the economic reform process. The public expenditure should be redirected towards education and, within education, towards the poor, basic education, skill development, technical and management education.
- International financial institutions also recognise education and medical facilities as a critical investment and promote an international environment to enable countries to sustain their socio-economic development. The external funding of the educational and medical sector could also be one of the solutions to maintain the system at its present levels of operational efficiency.
- Distance education has been recognised as one of the modes of spreading education. This is already prevalent, especially at the high school and university levels in the form of national open schools, correspondence courses attached to many universities, open universities at the national and some of the state government levels.
- A significant measure that captures many of the reform efforts is privatisation of education. It is argued by many that the private sector education in India can be efficient and hence the best way to improve the efficiency of the system is to increase the share of private schools. The State Governments should facilitate setting up of institutions in the private sector by providing incentives. The private sector, specially Delhi based institutions and other institutions of eminence like IITs, Roorkee University etc. could be encouraged to set up their branches in NCR towns, by making them available land at reasonable cost.
- One of the considerations for attracting foreign direct investment in the integrated township development would be availability of good educational and medical system which includes both formal and non-formal systems, quality technical education and medical facilities, universities and business schools, speciality hospitals, suitability/adaptability of the systems of education for expatriates, and availability of advanced/highly specialised fields of education and medicine.
- In order to encourage private and public institutions of higher and technical education to be set up in NCR, with a standard comparable if not better than of their counterparts in NCT-Delhi, there is a need to establish a National Level Affiliating University in NCR recognised not only nationally but also internationally for its academic standards, to which the NCR institutions can be affiliated.
- Food security, articulated largely through the PDS in operation in India, leaves much to be desired. The problems relate both to the inadequacy/low level of subsidy and lack of purchasing power in the hands of the poor, as well as of management and targeting. Effective access to PDS is a growth stimulating mechanism and sustaining factor for the potential low income migrants to Delhi. While the PDS infrastructure exists in most towns, its operational efficacy is at a low level. Lack of

- awareness among the vulnerable groups, inadequate stocks and inferior quality goods restrict the use of this facility by those who need it most.

12.5 LAW AND ORDER

12.5.1 Issues

Delhi is considered comparatively safe and well policed entity. Law and order problems as reported are less acute and entrepreneurs feel safe here. Often it is found that after committing crimes in Delhi, criminals take refuge in U.P. and Haryana territories. Many entrepreneurs have reservations about the law and order situation in U.P. and expect that this should improve for entrepreneurs to invest. This, many believe, is affecting dispersal/shifting of economic activities, especially to the U.P. Sub-region.

12.5.2 Strategies

- In view of the similarity in pattern of crime and operation of interstate criminal gangs in Delhi and its surrounding areas, there is a need to prepare a perspective plan for police modernisation in NCR. This entails improvement of human as well as material resources of police in the jurisdiction of States in NCR.
- There is need to set up a central coordinating agency/institutional mechanism, with similar police/administrative system (including uniform laws wherever required), to control and monitor criminal activities on regular basis in the region. This entails sharing of information through a unified communication system, a common wireless system and computerized crime record network for all Police Stations etc. in NCR.
- A mechanism needs to be evolved to sort out problems of delay in the arrest of interstate wanted criminals, trials of offences through coordination among police, prosecution, administration and judiciary.
- There is a need for identification of foreign national immigrants and their subsequent deportation from NCR.

13

HERITAGE AND TOURISM

In the Regional Plan-2001, no specific policies and programmes were envisaged for this sector. However, since tourism has great potential for the balanced & harmonised development and to strengthen the economic base of the National Capital Region, this plan lays special emphasis on integrated tourism development and heritage conservation & management in the region.

There is a close and symbiotic relationship between the imperative of tourism and heritage conservation. Coordinated strategies of heritage protection and tourism development will act as an important economic generator of employment and as an instrument to decentralised urban development.

13.1 HERITAGE

The heritage in region, both man-made and natural, has suffered through negligence and ironically also due to various acts of omission and commission attributable to the planned development of urban settlements and industrial areas as well as the unplanned and unauthorized growth in the National Capital Region on account of the earlier Plan not taking due cognizance of the sector.

13.1.1 Man-made Heritage

Few monuments protected by Archaeological Survey of India (ASI) or State Archaeological Departments are reasonably intact and have survived. However, a much larger number of unprotected monuments have suffered due to neglect, vandalism and encroachments, since there was no mechanism to prevent them in the existing Master/Development Plans as well as Regional Plan. The unprotected monuments refer to those monuments, which have not yet been identified as culturally valuable, but are nevertheless, good examples of cultural/historical heritage that should be provided with same level of protection.

Another valuable area of heritage that is being slowly obliterated is traditional urbanscape. This is because neither of the Centre/State Archaeological Protection Acts recognises them as possessing heritage value. These areas may or may not contain individual buildings, which qualify for protection, but when considered as an ensemble, they represent valuable heritage worthy of conservation.

Identification of Heritage Sites

There are 258 Centrally protected monuments and 20 State protected monuments in the region. The State wise protected monuments are given in Table 13.1.

Table 13.1: Number of Protected Monuments in various States of NCR

Protection/State	Haryana	Rajasthan	Uttar Pradesh	NCT-Delhi	Total
1	2	4	3	5	6
Centrally Protected	63	03	26	166	258
State Protected	01	17	02	NA	20

Source: Study Group Report on Environment including tourism, heritage, pollution, disaster management etc.

Besides the above legally protected monuments, the Indian National Trust for Arts and Cultural Heritage (INTACH) has listed a large number of monuments being worthy of receiving protection in NCR. It has so far identified 1,627 monuments and 26 conservation areas in the region that need to be protected. State wise details are given in Table 13.2. These heritage sites need to be identified and listed for appropriate protection. This will also help in identifying the existence of conservation areas, which require immediate attention.

Table 13.2: Number of Monuments and Conservation areas listed by INTACH

Sub Regions	Haryana	Uttar Pradesh	Rajasthan	Delhi	Total
1	2	3	4	5	6
Monuments	334	NA	85	1,208	1,627
Conservation Areas	0	NA	0	26	26

NCT-Delhi

Zaffar Hasan in 1911 had identified 1,321 monuments in Delhi and this number had also been reflected in MPD-2001. Because there was no positive policy for the conservation, over the years this number, according to INTACH, reduced to 1,208, which included 166 centrally protected monuments by ASI under ASI Act, 1958. The Municipal Corporation of Delhi had notified these monuments as heritage buildings. Besides these, State Government is proposing to notify about 150 monuments as soon as the GNCT of Delhi Act is notified for Preservation of Monuments. Remaining monuments are at present not receiving any protection and are under threat. The Government of NCT-Delhi is also in the process of enactment of a Heritage Building Act for preservation of the buildings, which are more than 100 years old.

13.1.2 Policies and Proposals for the Protection of Man-made Heritage Sites

Central and State Legislations ensure physical protection of the buildings/sites but they have not been able to control the development of the land appurtenant to the actual protected area. This is where it is possible to employ the instrument of the Town and Country Planning Legislation to protect the area around the protected monument. In view of this, following policies/strategies are proposed:

- i) The listing of monuments and conservation areas of all the towns/districts in NCR should be completed on priority basis. All the centrally protected, state protected and listed buildings should be identified with their footprints on the Master/Zonal Plans of each town and in the District Plans in the region. Specific requirements for their protection should be highlighted in the said plans and may vary according to their level of significance. A distinction needs to be made between the legally protected buildings and the 'listed' buildings. The 'listed' buildings do not require the same level of scientific protection as the centrally and state protected monuments.
- ii) Town and Country Planning Legislations of the constituent States have provisions for the development of "Special Areas". Each State should use this instrument to declare the area around the protected monuments to be special areas and prepare area level plans for an area covering 300 metres around it. These plans should clearly indicate the nature of development, permissible and non-permissible activities within this area in conformity with the prescriptions provided in the central and state archeological protection legislations.
- iii) In addition to protected/listed monuments, it is not unlikely that in view of the rich history of this region that hidden or not-yet-excavated sites also exist. The respective departments of archaeology should indicate where they reasonably expect to find underground ruins, and these areas should be duly identified in the Master Plan for each town and the respective district level plans. Buildings

proposed to be constructed in these areas should require a no-objection certificate from the relevant departments of archaeology before the building plans are sanctioned.

- iv) If evidence of historic buildings is revealed during the excavation for foundation, then the appropriate departments of archaeology should be allowed a specified period of time to record the evidence from this site and remove any artifact that is found before construction activity is permitted to proceed.
- v) In order to implement these policies, if any amendment is required in the Town and Country Planning Act of the constituent States, it should be done.

13.1.3 Natural Heritage

National Capital Region is endowed with rich natural heritage sites, which need to be developed as conservation areas. In order to conserve the biodiversity in the region, it can be divided into four categories. They are:

- i) Special protected areas: This includes national parks, sanctuaries and forests. They are listed as follow:
 - Sariska national park - Alwar, Rajasthan
 - Sultanpur national park - Gurgaon, Haryana
 - Indira Priya Darshini sanctuary - Asola, NCT-Delhi
 - Hastinapur sanctuary - Meerut, U.P.
- ii) Hilly areas:
 - NCT-Delhi Ridge
 - Aravallis at Gurgaon, Faridabad and Alwar
- iii) River systems, wetland and water bodies:
 - Yamuna
 - Ganga
 - Yamuna Wetland Systems
 - Nazafgarh Jheel, NCT-Delhi and Haryana
 - Bhalsava lake, NCT-Delhi
 - Damdama lake, Gurgaon (Haryana)
 - Sohna lake/Hot water spring, Gurgaon (Haryana)
 - Badkal and surrounding lakes, Faridabad (Haryana)
 - All existing constructed and natural water bodies including village ponds
- iv) Habitations:

This include urban and rural settlements, biodiversity in large variety of crops that grow in these areas, livestock, green areas and open spaces in the developed areas where biotic resources manifest themselves.

13.1.4 Policies and Proposals for the Protection of Natural Heritage Sites

All the identified areas of natural heritage should be protected in terms of land use and pollution control in the vicinity to ensure the protection of biodiversity and urban ecosystems.

Afforestation with right type of species and control of growth of monoculture should be taken up in hilly areas.

Cropping pattern, type of horticulture species that are grown and their effect on the soil, micro climate should be understood in order to save the good agricultural land from the loss of soil fertility. Right type of agricultural practices including social forestry, energy plantation and agro-forestry would go a long way to improve the natural environment. Database for the biodiversity in the region is very poor. It should be strengthened by undertaking certain specific studies.

The enforcement of the prohibition, directions notified by the Ministry of Environment and Forests, Government of India dated 07.05.1992 [under Section 3(1) and 3(2)(v) of the Environment Protection Act, 1986 and rule 5(3)(d) of the Environment (Protection) Rules, 1986 restricting certain activities in specified area of Aravalli Range which are causing environmental degradation in the region] should be ensured while taking up developmental activities in the region. A special Conservation Plan for the above notified areas should be prepared.

13.2 TOURISM

Considerable development of tourism has taken place in each State through the respective Departments of Tourism. The respective State Departments have been very active and have developed a variety of tourist sites in their States. This sector was not considered in the Regional Plan-2001. Considering it as one of the important economic activities in the region, it has been included in this Plan.

13.2.1 Identification of Tourist Sites

Tourism should be recognised as an important generator of employment and an instrument to decentralise urban development. Hence it becomes a key element in the land use policy and employment sector.

The tourism policy should be pro-active to diversify the options available for tourism destination and activities through the development of smaller tourism circuits so that the tourists can be persuaded to sample the diverse range of tourism options available within the region. Cultural heritage/monuments are major tourist destinations in NCR.

13.2.2 Policies and Proposals for Development of Tourism Sites

Tourism Development Plan should be prepared highlighting the smaller tourist circuits with one to four days trip within the region to promote tourism incorporating following policies and strategies:

- i) The heritage and tourist sites should be used as instruments to direct land use policy towards more decentralised patterns of development. They should be clearly identified on the land use plan to prevent encroachment and inappropriate development and should be integrated with the potentials for cultural and leisure tourism.
- ii) Tourism circuits covering tourism, leisure, cultural and heritage sites should be created with one to three days trip and should be given priority in development of transportation and other infrastructure. Fiscal incentives should be provided for the purpose. Private sector should be encouraged to help in development of tourism and also invest in maintenance & upkeep of tourist destinations in the region.
- iii) Tourism should be recognised as an important source of employment.
- iv) Proper database for heritage and tourism sites should be developed and updated from time to time.
- v) Publicity of the heritage and tourist sites in the National Capital Region should be done through media.

14.1 BACKGROUND

NCR, a dynamic urban region with more than 100 urban centres and endowed with ecologically sensitive natural features such as ridge, wetlands, sanctuaries etc. needs to be planned in a way to achieve an environmentally sustainable pattern of urban development through a rational land use pattern and conservation. The conversion of agricultural land into non-agricultural and abiotic uses in order to realise the land value potential is so severe that it would require a very consistent and deterministic policy to achieve this. The environment plays a crucial role in establishing the paradigm of future development. Environmental concerns need to be viewed holistically and concerns of both natural as well as built environment not only need to be conserved but also protected from various forms of natural hazards.

Regional Plan-2001 envisaged the following policies and proposals for the environment and eco-development in NCR:

- i) **Air pollution:** The pollution impacts have to be identified through appropriate field research studies so that the levels and types of industrialisation can be established for different Sub-regions.
- ii) **Water pollution:** No untreated domestic and industrial waste should be permitted to be discharged over land or into water bodies before treating it to the specified discharge standards under Environmental Protection Act, 1986. As far as possible, new industries be developed in identified and classified industrial areas/estates which should have proper effluent treatment facilities in-situ before effluents are discharged into natural areas. The settlements where regular sewerage schemes are not available, low cost sanitation system for individual family or community may be adopted as a short-term measure. Controlled environmentally protected zones for hazardous and polluting industries should be created.
- iii) **Solid waste:** Scientific approach should be adopted for the solid waste management and its re-use in all urban and agricultural areas.
- iv) **Coordination Committee:** A Coordination Committee for prevention and control of pollution of water, land and air should be established for NCR.
- v) **Afforestation Programmes:** It should be undertaken on all barren and uncultivable land by the concerned agencies.

Care should be taken by the local planning and plan implementing authorities at the time of preparing and implementing the development plans of the urban areas in their Sub-regions to contain the unplanned and uncontrolled spread of corridor developments all along the major transport arteries of the region.

Review of Regional Plan-2001 suggested that environmental degradation in the region should be arrested, waste water should be treated and recycled, eco-sensitive areas should be protected, environmental considerations should be integrated while planning for industries and pollution control norms of MOE&F should be enforced. It also pointed out that good agricultural land should be protected from urbanisation and unauthorised corridor development.

14.2 POLICIES AND PROPOSALS

Land is the most crucial and critical environment resource. Every land use/activity i.e., housing, transportation, industry, recreation, conservation etc. or their linkages have got environmental impact on air, water, soil etc. and in order to improve the environmental condition in the region following policies and strategies are proposed:

- i) Good agricultural land in the region should be protected and conserved. There is substantial surplus capacity in the existing urban areas other than Delhi to accommodate greater number of population. This may reduce the need for unnecessary conversion of good agriculture land to urban uses.
- ii) The land use allocation has to be carefully carried out in order to protect and conserve both surface and ground water resources.
- iii) Master/Development Plans for the towns in the region should incorporate land suitability analysis for land use allocations, which would identify areas intrinsically suitable for settlement, agriculture, forestry, industry and recreational uses. Further growth in the region should be channelised in the areas, which are only suitable for settlement growth.
- iv) The database for air quality, water quality (surface and ground water), noise pollution and land pollution is very poor and need to be created for the region. There are only three air quality monitoring stations in the region. In order to create better database, more air quality monitoring stations are required. A Committee should be setup in each of the Sub-regions of NCR by the respective State Governments to recommend locations of the monitoring station of air and water quality, to regularly review the status and recommend remedial measures. Pollution Control Boards of respective States should monitor the above-cited parameters on a regular basis. The data should be easily accessible to public for awareness.
- v) While carrying out activities for the development of the region, provisions under Environmental Protection Act, 1986 and Rules thereof should be followed. Carrying Capacity of the region based on Minimum National Standards should be followed in order to provide a better quality of life to the people in the region. Following factors should be considered:
 - Minimal national standards
 - The environmental sensitivity of the region
 - The carrying capacity of the receiving water bodies and environment
 - The existing quality of environment
 - The health requirements in the area
- vi) Industrial parks/estates with controlled environment and with Combined Effluent Treatment Plant (CETP) should be constructed considering the carrying capacity concept. For the hazardous waste producing industries in the region, land allocation should be done appropriately for Combined Treatment, Storage and Disposal Facility (TSDF). Similarly, State Governments should

encourage/adopt efficient and clean technology based power plants to meet the growing power demand for reduction in greenhouse gases (GHG) levels.

vii) Data inputs to check the performance of various parts of NCR in relation to these needs be made and regularly monitored. A Cell in NCRPB be created to perform this task.

viii) The areas/zones mentioned below located in NCR should be conserved/protected:

- Reserved/protected forests
- Forests other than reserved and protected forests
- Monuments-National, State, Local
- Heritage/cultural sites
- Scenic areas
- National parks
- Sanctuaries
- Areas with endangered species-flora and fauna
- Biosphere reserves
- Wetlands
- Resorts/areas of tourist interest
- Water bodies
- Springs/water recharge areas
- Other environmental resource areas

ix) The Ministry of Environment and Forests under Section 3(1) and 3(2) (v) of the Environment Protection Act, 1986 and Rule 5(3)(d) of the Environment (Protection) Rules, 1986 restricts certain activities in specified area of Aravalli Range which are causing environmental degradation in the region and prohibits following process and operations:

- a) Location of any new industry including expansion/modernisation;
- b) (1) All new mining operations including renewals of mining leases.

(2) Existing mining leases in sanctuaries/national parks and areas covered under Project Tiger; and/or

(3) Mining is being done without permission of the competent Authority.
- c) Cutting of trees.
- d) Construction of any clusters of dwelling units, farms houses, sheds, community centres, information centres and any other activity connected with such construction (including roads and part of any infrastructure relating thereto)
- e) Electrification (laying of new transmission lines)

No such activities should be undertaken in the Aravalli range in NCR.

In some areas carrying out of certain processes and operations without permission is prohibited. These include:

- (i) All reserved forests, protected forests or any other area shown as "forest in the land records maintained by the State Government as on the date of this notification in relation to Gurgaon district of the State of Haryana and the Alwar district of the State of Rajasthan.
- (ii) All areas shown as:
 - (a) Gair Mumkin Pahar, or
 - (b) Gair Mumkin Rada, or
 - (c) Gair Mumkin Bched, or
 - (d) Banjad Beed, or
 - (e) Rundh.

In the land records maintained by the State Government as on on the date of this notification in relation to Gurgaon district of the State of Haryana and the Alwar district of the State of Rajasthan.

- (iii) All areas covered by the notification issued under Section 4 and 5 of the Punjab Land Preservation Act, 1900, as applicable to the State of Haryana in the district of Gurgaon up to the data of this notification.
- (iv) All areas of Sariska National Park and Sariska Sanctuary notified under the Wildlife (Protection) Act, 1972 (53 of 1972).

15

DISASTER MANAGEMENT

15.1 BACKGROUND

Human settlements are frequently affected by natural disasters, which take heavy toll on human lives, destroy buildings and infrastructure and have far reaching economic and social consequences for the community. Among all the natural disasters that the country faces, river floods are the most frequent and often most devastating.

According to a Study undertaken by UNCHS (Habitat) and HUDCO, on an average, natural disasters take a toll of over 3,663 human lives, affect 14.2 lakhs hectares crop area and damage 26.3 lakhs houses annually. Past statistics reveal that about 80% of human lives were lost, due to collapse of houses and buildings.

15.2 VULNERABILITY AND RISK ASSESSMENT OF THE REGION DUE TO NATURAL HAZARDS

The Vulnerability Atlas of India indicates that the National Capital Region falls within:

- i) High damage risk zone (MSK VIII)-with regard to earthquake
- ii) Very high damage risk zone B ($V_b = 50\text{m/s}$)-with regards to wind and cyclone hazard and
- iii) Areas liable to floods

Regional development/construction in NCR need to be planned taking care of the above natural and man-made hazards.

The occurrence of earthquakes in and around Delhi is attributed to the following prominent tectonic features:

- a) The Sohna fault
- b) Aravalli fault
- c) The hidden Moradabad fault in the Indo-Gangetic basin
- d) Sonapat-Delhi-Sohna fault
- e) Junction of Aravalli and Sohna fault
- f) Delhi-Haridwar ridge

Earthquakes of intensity lower than four on the Richter scale have originated from 14 epi-centres located in the NCR and shown on Map 15.1 National Capital Region: Seismo-tectonic Features. Besides, there are several other parallel faults inferred from geomorphological studies. Earthquake in Delhi and neighbourhood areas is related to tectonic activity along these faults.

Table 15.1 below provides the list of earthquakes of 5.0 intensity and higher on Richter scale in the National Capital Region.

Table 15.1: Earthquake with Intensity more than 5 on Richter scale

Date	Time of Origin (GMT)	Latitude (⁰ N)	Longitude (⁰ E)	Focal Depth (Km)	Magnitude
1	2	3	4	5	6
1720, 15 th July	-	28.40	77.10	-	6.5
1803, 1 st September	-	27.00	77.00	-	6.8
1809	-	30.00	79.00	-	6.0
1842, 16 th January	-	27.00	78.00	-	5.5
1842, 5 th March	-	30.00	78.00	-	5.5
1956, 10 th October	15:31:36	28.20	77.70	-	6.7
1960, 27 th August	15:58:592	28.20	77.40	109.0	6.0
1966, 15 th August	02:15:28	28.67	78.93	5.0	5.6

Source: IMD Catalogue

Similarly, the region lies in the flood prone area and inundation during monsoon is a regular feature. As per the past history of the floods in the Ganga and Yamuna sub-basin, the districts affected are Meerut, Ghaziabad & Bulandshahr in U.P. and Rohtak, Panipat & Sonapat in Haryana.

Earthquake

Seven earthquakes of Richter magnitude 5.5 to 6.8 are known to have occurred in NCR and its surrounding areas since 1720 AD. Two major lineaments, namely Delhi-Hardwar ridge and Delhi-Moradabad fault, pass through the territory, both having potential of generating earthquakes of magnitude up to 6.5 to 6.7 and normal depth of 30 kms. It will be prudent to consider the effects of such a potential earthquake for developing a prevention-cum-preparedness plan.

NCR region falls in seismic zone IV as per seismic zone map of Indian Standard IS 1893. This makes the area liable to MSK intensity of “VIII” and is considered as High Risk Zone. Such intensity may cause severe damages some of which are listed below:

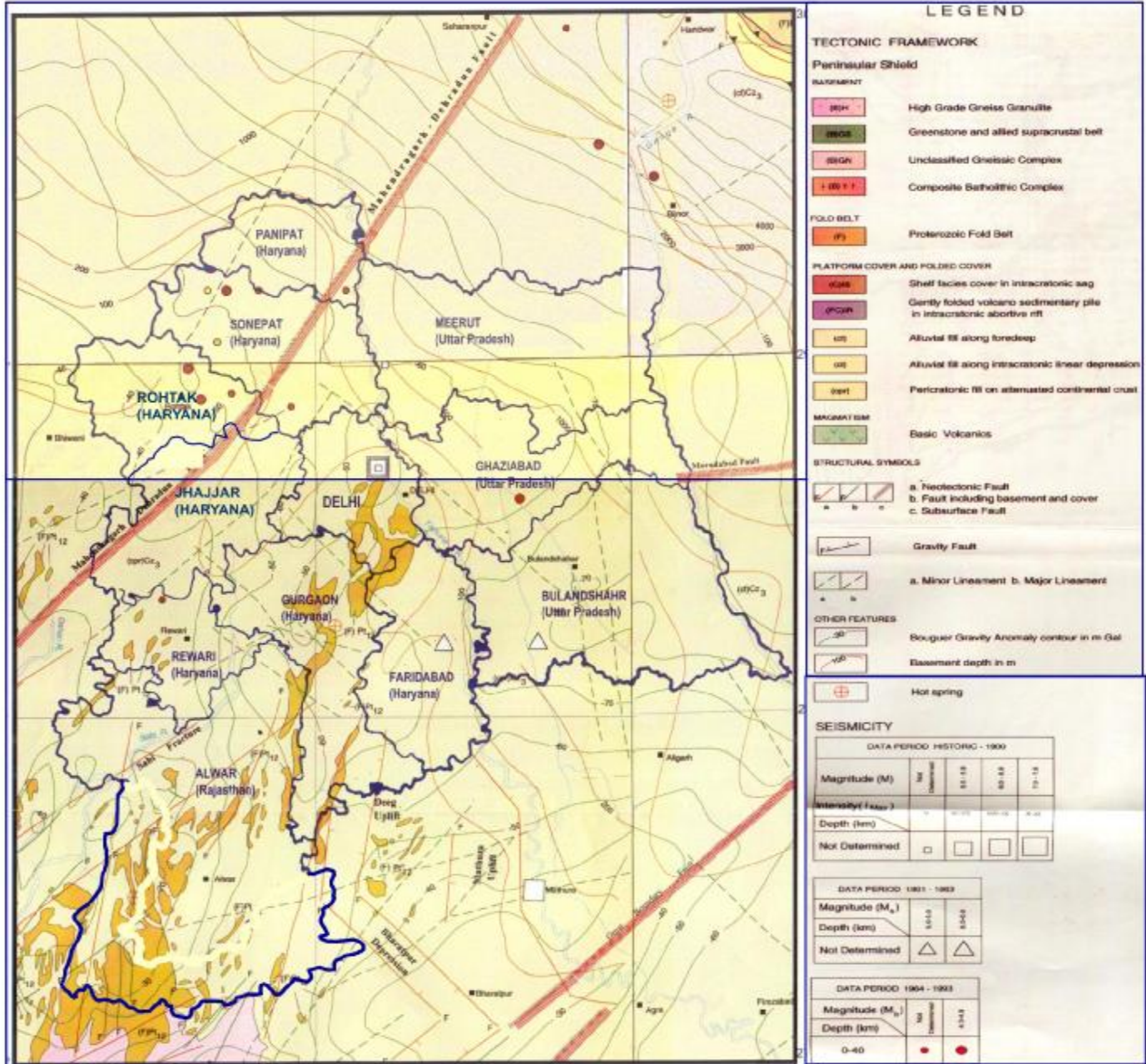
- Type A-Houses constructed with stone, rural structures, un-burnt bricks, clay etc. may suffer destruction causing gaps in walls, collapse of parts of buildings, loosening of cohesion of parts of buildings and collapse of inner walls.
- Type B-Buildings construction with ordinary bricks, large blocks, natural stone and prefabricated type buildings may suffer heavy damage causing large & deep cracks in walls.
- Most buildings of Type C i.e., RCC buildings may have small cracks in walls, fall of large pieces of plaster, slipping off tiles, cracks/fall in chimneys etc.
- Fright and panic is caused among people, breaking off of branches of trees etc. takes place.

The areas subjected to damaging intensities MSK VIII and VII in three earthquakes on Richter scale 6.5 are as given in Table 15.2.

Table 15.2: Areas Affected under Earthquake of Magnitude 6.5 (in sq kms)

Earthquake	Magnitude	I=VIII	I=VII	Total under VII & VIII
1	2	3	4	5
Koyna, 1967	6.5	130	430	560
Uttarkashi, 1991	6.6	700	1300	2000
Killari, 1993	6.3	420	930	1350

NATIONAL CAPITAL REGION SEISMO-TECTONIC FEATURES



LEGEND

TECTONIC FRAMEWORK

Peninsular Shield

BASEMENT

- High Grade Gneiss Granulite
- Greenstone and allied supracrustal belt
- Unclassified Gneissic Complex
- Composite Batholithic Complex

FOLD BELT

- Proterozoic Fold Belt

PLATFORM COVER AND FOLDED COVER

- Shelf facies cover in intracratonic sag
- Gently folded volcano sedimentary pile in intracratonic abortive rift
- Alluvial fill along foredeep
- Alluvial fill along intracratonic linear depression
- Pericratonic fill on attenuated continental crust

MAGMATISM

- Basic Volcanics

STRUCTURAL SYMBOLS

- a. Neotectonic Fault
- b. Fault including basement and cover
- c. Subsurface Fault

Gravity Fault

- a. Minor Lineament
- b. Major Lineament

OTHER FEATURES

- Bouguer Gravity Anomaly contour in m Gal
- Basement depth in m

Hot spring

-

SEISMICITY

DATA PERIOD: HISTORIC - 1900			
Magnitude (M)	3	5.1-5.9	7.1-7.9
Intensity (I _{max})	II	III-IV	V-VI
Depth (km)	0-10	10-20	20-30
Not Determined	□	□	□

DATA PERIOD: 1961 - 1993			
Magnitude (M _s)	3	5.1-5.9	6.0-6.9
Depth (km)	0-10	10-20	20-30
Not Determined	△	△	△

DATA PERIOD: 1964 - 1993			
Magnitude (M _s)	3	5.1-5.9	6.0-6.9
Depth (km)	0-40	41-100	101-150
Not Determined	●	●	●

Considering the areas affected during past earthquake of M 6.5, it can be expected that such an earthquake occurring in NCR could adversely affect the entire region with damaging intensities and could affect more than 50% of CNCR depending on the location of the epi-centre. Therefore, in terms of probable damage scenario, *the National Capital Region is most prone to earthquake. The whole urban development must be checked for safety against an intensity "VII" probability of occurrence, and upgraded for required seismic resistance in buildings and infrastructure as found necessary.*

Floods

As per the Flood Atlas of India prepared by Central Water Commission, it is observed that only small portion towards the south-east in Delhi is unprotected flood prone area (about 1.7% or 25 sq kms) and considerable area (about 5% or 74 sq kms) in the north-eastern parts which is protected by earthen embankments. Flood levels in Yamuna cross the danger level almost every year and people living in low lying areas behind the 'bunds' (embankments) are forced to evacuate to the top of the bunds or on road sides at higher elevations. The flow and the expected flood levels of the river Yamuna at Delhi is forecast by the Central Water Commission through hydrological and hydraulic observations on the upstream, particularly taken at Tajewala headworks about 130 km upstream from where two canals take off from the Yamuna, one on its left bank (WJC) and the other on the right bank (EJC). Since the Tajewala Barrage/headworks and the two canals have limited capacity, in the event of heavy precipitation in the catchment area of Yamuna and its tributaries, the river downstream comes in spate, overflowing its banks and flooding the adjoining low lying areas. Also great damage is caused to areas deep inside the region because of the back flow in the drains which is otherwise meant to discharge excess water into the river. In addition, heavy precipitation within the region causes local flooding of streets and localities on a large scale.

High Winds

So far as the wind hazard is concerned, design wind speed in the entire region is 47 m/s (169 km/h) as per IS 875 (Part 3), which could be reached only occasionally in what is called 'Andhi' (wind storm). The structures in this region should be designed keeping in view the above wind speed. In such events, weak houses of thatch, sheets etc. and those with sloping roofs using thatch, tiles, AC sheets and corrugated Galvanized Iron (CGI) sheet roofs, which are not fully anchored and integrated, will suffer damage. The damage occurring in 'Andhis' is again of localized nature and does not result in 'disaster' in the region.

Using the houses type data based on the Census 2001, the risk to the housing stock from the wind hazard could be worked out for different regions similar to the vulnerability risk tables prepared using Census 1991 data in the Vulnerability Atlas of different States.

This wind scenario does not cover the risk of tornado, which is a seldom case in respect of its occurrence, intensity and path, and is extremely difficult to deal with in general hazard risk studies. Also, in any one wind storm, it is unlikely that the whole or a large part of Delhi will be affected at once, and neither is there any possibility of a disastrous consequence from this hazard.

Fire Hazard

Fast growing cities like Delhi located in NCR are threatened by fire hazards, which may be attributed to following main reasons:

- Non-implementation of fire safety norms as part of building bye-laws.
- Encroachment, over crowded and haphazard growth affect the movement and timely approachability of fire tenders in emergency.

- Illegal and loose electric connections.
- Sub-standard wiring and over loading of electrical system.
- JJ clusters constructed with highly flammable material and some constructed with very toxic materials like plastics, polyethylene sheets, bamboo, soft wood etc. without proper access for fire tenders.
- Illegal storages and hazardous commercial activities.
- Inadequate pumping facilities hamper fire fighting and control of fire.
- Inadequate availability of special fire fighting equipments with local bodies especially for high rise multistoried buildings, where it is a prerequisite.

NCT-Delhi Sub-region with multi-faceted activities and a large number of multi-storied buildings, increased population density and mixed occupancy, is most vulnerable to fire hazard. Other towns such as Ghaziabad, Gurgaon, Noida, Alwar, Faridabad, etc. are also more vulnerable to fire hazard, with increased industrialization and development of multi-storied buildings.

A comprehensive study of the vulnerability due to fire hazards in the region and in different areas of fast growing towns should be taken up and adequate safety provisions be made for future planning of NCR and improvement in the quality of electrical cabling, wiring and distribution systems should be made.

15.3 POLICIES AND PROPOSALS

Following policies and strategies for disaster management are being proposed:

- i) Disaster management is a multi-sectoral, multi-disciplinary subject, which involves many groups. Therefore, all the groups (Government/NGOs/Community) should work together. There is a need to have proper planning at various levels for disaster preparedness, mitigation and response. Disaster Management Committee (DMC) may be formed at Sub- regional level and District Disaster Management Committee (DDMC) at district level. Further, detailing of roles and responsibilities of the Committees should be given in the Sub-regional Plans.

It is also suggested that Post-disaster Management Plan should form part of the Sub-regional Plan. The contents and guidelines required to be followed by the participating States and NCT-Delhi for this purpose should be clearly defined.

- ii) Human resource development is an important aspect of capacity building where several players are involved. For this, training programmes are essential for people from various organizations. Organizing workshops, seminars, research activities etc. should be undertaken periodically.

Disaster Management Centres may be established at strategic locations in the region for sensitizing people, training of personnel and mitigation measures.

- iii) Efforts need to be made on using state of art technologies viz., GIS, GPS, remote sensing, computer modeling and expert systems, electronic information and management systems etc. for collection,

storage, retrieval and dissemination of information. The control rooms need to be modernized and made more effective and community friendly in the participating States.

Detailed database should be compiled on the occurrence of hazards, damage caused to buildings and infrastructure and the economic losses suffered by various government departments, public and private enterprises, agriculture and horticulture and the related infrastructure in the area. This information should be widely publicized to create awareness among public. District administration should be prepared for all eventualities in future.

Telecommunications in terms of disaster warning systems need to be provided for rapid dissemination of warnings to the designated addressees even at remote places in vernacular languages. Disaster warning sets may be located in the States and district level headquarters.

- iv) A complete techno-legal regime has to be proposed for amending the present building bye-laws to include safety aspects from natural hazard's point of view.

The relevant Town and Country Planning acts, Development and Municipal Acts of the participating States should be carefully examined and amendments be carried out to incorporate necessary provisions on safety aspects relating to natural hazards. Development Control Rules and Building Bye-laws applicable in the Sub-regions should be appropriately modified by the constituent States, having provisions on safety aspects relating to natural hazards and fire safety. All multi-storied and high-risk buildings [as defined by the Earthquake manuals and National Building Code (NBC)] should be established keeping in view their ability to withstand earthquake of the defined intensity.

The States need to take up review of relief manuals and scarcity preparedness guidelines to suit local needs and geo-climatic conditions.

Appropriate guidelines have to be developed to cover the aspects of land use zoning, hazard resistant building construction. Transfer of better technologies can be effected through building centers.

- v) The participating States should undertake the vulnerability and risk assessment of their respective Sub-regions due to natural hazards and prepare Prevention cum Preparedness Plan as a part of Sub-regional Plan. Priority should be given to public buildings (such as hospitals, educational institutional, power stations, infrastructures, heritage monuments, life-line structures and those which are likely to attract large congregation) keeping in view their ability to withstand earthquake of the defined intensity. Suitable action should be taken by the State Governments for retrofitting and strengthening of structures identified as vulnerable as per earthquake manuals and NBC. Innovative construction technologies should be studied and implemented.

Keeping in view the geotectonic features of the region, it is observed that rocky ridges, although form a small part (as indicated in Map 15.1), yet act as water divides for recharging the aquifer of the surrounding areas and therefore, should be kept preserved.

- vi) Earthquake: Seismic micro-zonation on a scale of 1:1,00,000 to 1:1,50,000 should be prepared by the participating States for their respective Sub-regions based on the already available data/indicators. Seismic micro-zonation for selected areas/towns, having high growth rates should be taken up on priority.

There are certain areas like Rohtak, which are topographically low and flood prone, as such any development in these areas should be taken up keeping in view that these are also seismically intense zones.

- vii) Flood: Different areas in NCR, which are liable to flooding in rivers of return period of 5, 10, 25, 50 and 100 years, need to be identified on map for land use zoning at regional and Sub-regional levels. Participating States should prepare detailed Contour Maps for their respective Sub-regions on a scale of 1:1,5000 at a contour interval of 0.3 to 0.5 metre and mark areas that are flood prone.
- viii) High Winds: It is also observed that desert is extending eastward in the southern part of NCR. Suitable measures should be adopted to arrest the tendency of desert extension in this part of the region.
- ix) Fire: Comprehensive risk evaluation of growing towns should be undertaken on priority in order to identify areas in each town vulnerable to fires and database in terms of available equipments and personnel should be compiled and periodically updated.

Areas in cities and towns in NCR may be classified as High Vulnerability, Moderate Vulnerability, and Low Vulnerability from fire hazard's point of view. Fire safety measures for different areas should be worked out as per the basic character of cities/towns.

Part IV of National Building Code and other related Indian Standards provide safety regulations. These should be followed by the participating States as guide for formulating Development Control Rules/bye-laws for mitigation of the fire hazard.

Fire departments/authorities should be involved in planning for NCR from the initial stage so that there is a coordinated effort among different participating States.

16

RURAL DEVELOPMENT

16.1 BACKGROUND

As per the Remote Sensing data pertaining to 1999, about 91% of the total area of NCR was rural, accommodating about 43.61% of the population (Census 2001). Outside NCT-Delhi, which is predominantly rural, of the total population of 371 lakhs, 162 lakhs i.e., more than 44% live in the 7,528 rural settlements (2001) of the region. Thus a large area and population will be left out of planned development, unless the rural areas of NCR are included in the planning exercise. There is no development control in locating various economic activities in the rural areas, falling outside the controlled/development/regulated areas of the towns, which has resulted in the growth of unplanned urban/industrial activities. Secondly, rural settlements, located in the fast growing Delhi Metropolitan Region, are undergoing physical and socio-economic changes, particularly the rural settlements in NCT-Delhi and adjacent to the DMA towns, Priority towns and on the major transport corridors.

Regional Plan-2001 provided for lower order facilities in the Basic Villages and higher order facilities in Service Centres. The Plan emphasized on upgradation of skills of rural workers, training for rural artisan, creation of employment opportunities, provision of low-cost rural housing, water supply and sanitation facilities in rural areas. It also provided for preparation of integrated plans for cluster of villages at the block level as pilot project.

Review of Regional Plan-2001 recommended that in the settlement hierarchy, a category of central village should be added between the basic village and service centre. It also suggested that integrated District Development plans may be prepared by the States within the framework of Sub-regional Plans as mandated in the 74th Constitutional Amendment Act. It further suggested notifying the entire rural area in NCR as one area under the common legislation in order to control the unauthorised conversion of rural land use to urban use.

16.2 ISSUES

16.2.1 The existing Town and Country Planning Act of the constituent States have provisions for preparation of Master/Development Plan for the notified development/controlled/regulated area around a town and do not have any control on location of urban activities in rural areas outside development/controlled/regulated areas. In fact, none of the Acts are aimed at regional development per-se and are limited to urban planning and development.

16.2.2 No District Development Plans as per the 73rd and 74th Constitutional Amendment Acts have been prepared in NCR.

16.2.3 The rural settlements, which are very close to the national Capital and other Metropolitan cities, are undergoing rapid physical and socio-economic changes, causing haphazard development and shortages of basic services like water supply, power, sanitation, drainage etc.

16.3 POLICY AND PROPOSALS

16.3.1 At the regional level, comparably less developed districts should be identified based on development differential among the districts using human development and economic indicators like literacy, life expectancy, infant mortality, productivity and per capita income etc. by the States at the time of preparation of the respective Sub-regional Plans. The Sub-regional Plans would suggest a strategy for the balanced development of the districts. It will also set the socio-economic goals for the District Plan envisaged through the 74th Constitutional Amendment Act.

16.3.2 Service Centres and Central Villages will be identified in the Sub-regional/District Plans by the respective State Governments based on their growth potential, size and capability of performing central functions for the Basic Villages.

16.3.3 Respective State Governments will prepare the detailed rural development programmes and incorporate the same in the Sub-regional Plans as well as in the District Plans. These programmes should be prepared keeping in view the objective that migration from the villages to the neighbouring towns and industrial areas should be restricted to the extent possible.

16.3.4 Other strategies, in addition to above, which should be incorporated in the Sub-regional Plans, are as follows:

- (i) Training programmes in micro-entrepreneurship, processing of local produce, vocational skill upgradation etc., allied agro-economic activities such as poultry, dairy, pottery, handlooms, handicrafts and rural tourism may be encouraged.
- (ii) Financial incentives and loan schemes for starting micro-enterprises may be worked out and delivered in a package through district planning.
- (iii) Providing urban amenities/facilities in rural areas such as housing, better sanitation, water supply, communication system, social infrastructure etc., to improve the quality of life in the rural areas. Also provide better connectivity among various types of settlements in the rural areas.
- (iv) Increasing demand for exotic agriculture produces in the Metropolitan cities of NCR should be met through cultivating non-conventional crops such as mushrooms, broccoli, baby corn, bamboo shoot, poultry, fish as well as floriculture. The State Governments should provide necessary infrastructure in terms of technical know-how, finance and marketing support facilities etc. to the farmers to promote the non-conventional high value commercial farming in NCR. This will increase per unit earning and also reduce the risk of its conversion to other uses.
- (v) Promotion of strategic partnership between government agencies, private sector, NGOs and Cooperatives in the areas of marketing, research and development and growth of rural infrastructure.
- (vi) Dissemination of relevant information on regular basis to apprise rural people about new opportunities, on-going programmes, sources of micro-credit, market potentials, etc.

- (vii) The various programmes of the Ministry of Rural Development should be incorporated in the Sub-regional Plans and District Plans followed by the Action Plans for their implementation by the constituent State Governments and their agencies.
- (viii) The State Governments and their agencies should identify and promote dairy growth centres in the rural areas while preparing the Sub-regional Plans and District Plans.
- (ix) In order to protect rural areas from unauthorized activities, necessary provisions be made in the Sub-regional Plans by the State Governments.

17

REGIONAL LAND USE

17.1 BACKGROUND

17.1.1 Statutory Provisions

Section 10(2) (a) of the NCRPB Act, 1985 emphasizes that the Regional Plan shall indicate “the policy in relation to land use and the allocation of land for different uses”. Therefore, the Regional Land Use Plan translates broad planning policies and proposals into physical (spatial) form to illustrate the manner in which the land in NCR is to be used for various purposes. However, the detailed specific reservation of areas for various land uses of Sub-regional and urban importance will be detailed out in the Sub-regional Plans and Master Plans which are to be prepared by the respective participating States, within the overall framework of the Regional Plan.

17.1.2 Legal Status of Regional Land Use

The Regional Plan-2001 of NCR was prepared with the active participation, inputs and guidance by the concerned Central Ministries and participating State Governments through their departmental experts, and was approved on November 3, 1988. This Plan came into force from January 23, 1989. The actual implementation of the Regional Plan polices is being undertaken by the concerned Central Ministries and participating State Governments through their various departments.

The Allahabad High Court, while going through the various Plan-enabling provisions under the NCRPB Act, 1985, considered the Regional Plan a major instrument of development. In a judgement dated 18.12.1998 in the Civil Misc. Petition No.13899 of 1998, it observed:

"The National Capital Region Plan Act, 1985 is a central legislation. The intention of this central legislation is to decongest Delhi, and yet retain the conforming uses of agriculture and greens, and to harmoniously coordinate and monitor industry and urbanisation without compromising with the conforming areas and usage"

"... land uses cannot be changed except with the tacit permission and close scrutiny of the National Capital Region Planning Board. Development of industry or urbanisation by purchase of land reserved for conforming uses of agriculture, forests or greens within the area eclipsed by the National Capital Region, is prohibited. Whatever development is permissible must be strictly monitored under the National Capital Region Plan Act, 1985 by the authorities named and constituted under it."

In the judgement dated 01.10.1996 in Civil Misc. Writ Petition No.26737 of 1993, the Hon'ble Allahabad High Court observed:

"... One stipulation is inescapable that unless the National Capital Region Planning Board gives the green signal nothing can go ahead. The necessary implication of this is also that at every stage in

reference to the plans, aforesaid, constituent State a part of the National Capital Region Plan has to keep a close consultation with, the federal agency which is the Board”

“... Thus, to permit aspects, in context, to be examined by the Board, the Court adjourns these proceedings for a period of two months to enable the Board to approve, review, consult, affirm or confirm the plans which are the subject matters of these writ petitions in total freedom notwithstanding that a notification has been issued for acquisition of land by the State of Uttar Pradesh or for that matter that these proceedings are pending before the High Court. The only guidance which this court gives to the Board is to give effect to the intentions of the Act coordinating, monitoring and scrutinizing the implementation of the plans and for harmoniously building urban planning with excellence without disturbing the ecological balance of nature and by respecting the green cover, agriculture and not abdicating either in favour of urbanization but with a dedicated effort to respect the forests and strive to retain the balance of nature and ecology and at every given occasion not losing the perspective in so far as the Board is concerned in these matters, of the fundamental duties enshrined in Article 51 A(g) (h) and (j) read with 48 A of the constitution of India”

17.1.3 Review of Regional Plan-2001

- (i) The review of Regional Plan-2001 policies has brought out certain critical issues of large scale conversion of rich agricultural land into non-agricultural use, and conversion of land along the transport corridors in Delhi urban area, DMA (now CNCR) and close to the designated urban centres.
- (ii) In some States, proper land use control is exercised only within controlled/development/regulated areas around towns through their existing Acts but no planning/development control is available outside the controlled/development/regulated areas.

17.2 LAND USE ANALYSIS

17.2.1 Existing Regional Land Use 1999

The existing land use analysis through the Remote Sensing data pertaining to 1999 indicates that the “agricultural use”, which includes cultivated land, fallow, plantation, farmhouses and horticulture being the predominant use of land, constitutes 79.52%, (24,04,964 hectares) of the total land area of NCR. The Sub-region wise distribution of agricultural land reveals that Haryana has recorded highest area under “agriculture use”, which constitutes 46.70% of the total NCR followed by U.P. (38.11%), Rajasthan (12.60%) and NCT-Delhi is the lowest (2.59%) (refer Map17.1 National Capital Region: Land Use 1999).

The “built-up area”, which includes settlements, all sub-uses such as residential, transport, industries, commercial etc. within it, is the second largest use of land in NCR, constitutes 8.71%, (2,63,500 hectares). Haryana has the highest concentration (35.52%) of the area under "built up" category in NCR followed by U.P. (31.58%), NCT-Delhi (26.63%) and Rajasthan (6.27%).

The “wastelands”, which include gullied land, saline land, barren, rocky and water logged areas, constitutes 6.63% (2,00,535 hectares). The highest concentration of “wastelands” has been recorded in Rajasthan constituting 49.03% of the total wastelands of NCR mainly because of the existence of Aravalli ridge area followed by Haryana (33.11%) U.P. (14.83%) and NCT-Delhi (3.03%).

The “forests”, which include forests, non-agriculture plantation and open scrub, constitute 4.02%, (1,21,435 hectares). In the case of forest cover, Haryana again recorded the highest concentration constituting 37.88% of NCR followed by U.P. (32.45%), Rajasthan (23.90%) and NCT-Delhi (5.78%).

The highest concentration of forest cover is in Haryana and U.P., which may be due to large-scale road/rail/canal side plantations and social forestry.

The “water bodies” include rivers, canals, drains, lakes, tanks and ponds covering 0.80% (24,217 hectares) of NCR’s total land area. Haryana has the highest share of the area under “water bodies” constituting 41.10% followed by U.P. (39.75%), NCT-Delhi (10.05%) and Rajasthan (9.10%).

The “others” comprise uses not included in the above categories i.e., mining, quarrying, brick kiln constitutes 0.32% (9,549 hectares) of NCR. In case of land under “other uses”, U.P. has the highest share of 70.42% followed by Haryana (24.49%), NCT-Delhi (3.46%) and Rajasthan (1.63%).

The details and Sub-region wise comparison of land uses are given in the Tables 17.1 and 17.2. The spatial distribution of the land uses at Regional level for 1999 are indicated in the Plan (refer Map 17.1 National Capital Region: Land Use 1999) based on IRS (PAN + LISS III) data acquired on March, 1999.

Table 17.1: Existing Land Use in NCR (1999)

Category	Area (hectares)	% to total
1	2	3
Built-up	263,500	8.71
Agriculture	24,04,964	79.52
Forest	1,21,435	4.02
Wastelands	2,00,535	6.63
Water bodies	24,217	0.80
Others	9,549	0.32
Total NCR	30,24,200	100.00

Source: Study Report on Urban Sprawl and Land Use/Land Cover Mapping for NCR-NRSA, 1999.

17.2.2 Land Use Change Analysis (1986-1999)

The existing land use for the Regional Plan-2001 was prepared in 1986 and published along with the Regional Plan in January 1989. The NCR Planning Board used satellite data (IRS IC PAN + LISS III with 5.8 metres resolution) for the whole of NCR for March 1999. A comparative analysis of the level-I land use data for the year 1986 and 1999 has been undertaken and is indicated in the Table 17.3.

Table 17.2: Sub-region wise Land Use in NCR based on 1999 Satellite Imagery data (in hectares)

Category	NCT-Delhi Sub-region		Haryana Sub-region		Rajasthan Sub-region		Uttar Pradesh Sub-region		Total NCR	
	Area	%	Area	%	Area	%	Area	%	Area	%
1	2	3	4	5	8	9	6	7	10	11
Built-up	70,162	47.31	93,597	6.98	16,527	3.68	83,214	7.67	2,63,500	8.71
Agriculture	62,279	42.00	11,23,017	83.73	3,03,071	67.45	9,16,597	84.46	24,04,964	79.52
Forest	7,015	4.73	46,002	3.43	29,017	6.46	39,401	3.63	1,21,435	4.02
Wastelands	6,079	4.10	66,392	4.95	98,326	21.88	29,738	2.74	2,00,535	6.63
Water bodies	2,435	1.64	9,953	0.74	2,203	0.49	9,626	0.89	24,217	0.80
Others	330	0.22	2,339	0.17	156	0.03	6,724	0.62	9,549	0.32
Total	1,48,300	100.00	13,41,300	100.00	4,49,300	100.00	10,85,300	100.00	30,24,200	100.00

Source: Based on the Study Report on Urban Sprawl and Land Use/Land Cover Mapping for NCR, NRSA, 1999.

Table 17.3: Land Use in NCR for the year 1986 and 1999 (in hectares)

Category	1986		1999	
	Area	%age	Area	%age
1	2	3	4	5
Built-up	98,794	3.26	2,63,500	8.71
Agriculture	26,50,585	87.64	24,04,964	79.52
Forests	77,512	2.56	1,21,435	4.02
Wastelands	1,85,886	6.14	2,00,535	6.63
Water bodies	3,235	0.10	24,217	0.80
Others	8,200	0.27	9,549	0.32
Total	30,24,200	100.00	30,24,200	100.00

Source: Study Report on Urban Sprawl and Land Use/Land Cover Mapping for NCR, NRSA, 1999.

Major changes have been observed in the case of agriculture land use, built-up and forest as indicated in Figure 17.1.

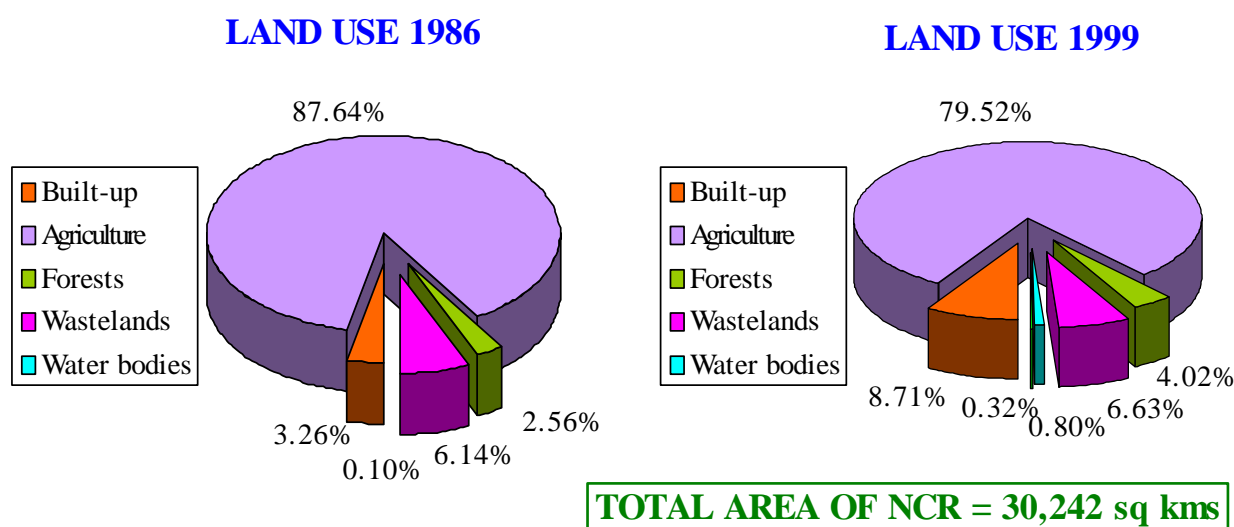


Figure 17.1: Land use Distribution in National Capital Region for the year 1986 and 1999

The use-wise land use change analysis is as under:

a) Agriculture

The land use change analysis reveals that there is a decline of about 8.12% (i.e., from 87.64% to 79.52%) in agricultural land during the period 1986-1999 indicating a threat to the rich agriculture land in the region. This warrants a rational policy for protecting the rich agricultural land for conversion into non-agriculture use.

The total decrease of agricultural land in 13 years (i.e., from 1986-1999) is 2,45,621 hectares, which works out to be 18,893 hectares per year. This conversion of agricultural land into non-agricultural uses specially through expansion of settlements is caused by development process. This conversion of agricultural land into non-agricultural uses has been indicated in the Table 17.4.

Table 17.4 indicates that major reduction in agricultural land has occurred due to the invasion of the built-up area (caused by expansion of settlements) i.e., 61.52% followed by forest plantations (28.76%).

Table 17.4: Conversion of agricultural land into non-agricultural uses

Agriculture land converted into	Area (in Hectares)	Percentage
1	2	3
Built-up	1,54,000	61.52
Forest plantation	72,000	28.76
Water bodies	18,300	07.31
Other uses	6,000	02.39
Total	2,50,300	100.00
Conservation of Wastelands into agriculture land	4,900	--
Net decrease	2,45,621	--

b) Built-up

The built-up area increased from 98,794 hectares in 1986 to 2,63,500 hectares in 1999, recording an increase of more than 166% in a span of 13 years. This increase in the built-up area has been caused by the conversion of the following land uses into built-up areas (refer Table 17.5).

Table 17.5: Conversion from Non-Built-up area into Built-up areas

Built-up area converted from	Area (in Hectares)	Percentage
1	2	3
Agriculture	1,54,000	93.45
Wastelands	10,100	06.13
Forest	600	00.36
Other uses	100	00.06
Total	1,64,800	100.00

The above table indicates large-scale conversion of agriculture land to built-up areas caused by industrial and urban development, specially observed along the transport corridors and in the fringe areas of Delhi's Urban Area within NCT-Delhi and the CNCR outside NCT-Delhi. This requires utmost care so as not to convert fertile agriculture land for urban development purposes and as far as possible utilisation of infertile/wastelands for this purpose.

c) Wastelands

The wastelands accounted for 1,85,886 hectares (6.14%) in 1986, which marginally increased to 2,00,535 hectares (6.63%) in 1999 (refer Table 17.6). Analyses of the inter-se conversions indicate that while 10,100 hectares of wastelands got converted into built-up areas, and others i.e., brick kilns and quarries etc., some area under forest and water bodies i.e., 31,800 hectares got converted into wastelands. Thus a net increase of 14,700 hectares recorded in the wastelands.

Table 17.6: Conversion of Wastelands

Areas converted from different uses to Wastelands		Wastelands converted into different uses		Net increase/decrease in wastelands
Use	Area (in Hectares)	Use	Area (in Hectares)	Area (in Hectares)
1	2	3	4	5
Forest	29,700			
Others (Brick-Kilns etc.)	2,100			
		Built up	10,100	
		Agriculture	4,900	
		Water Bodies	2,100	
TOTAL	31,800		17,100	+14,700

d) Forest

The analysis indicates only a marginal increase in the forest cover, which constituted 2.56% of the NCR in 1986 and increased to 4.02% in 1999 (refer Table 17.7). There is a dire need to substantially increase the forest cover in order to improve the environmental conditions, particularly the ridge/undulating areas of the region as well as both within the large settlements in the form of city forest and on their periphery as protective belts.

The increase in forest cover from 77,512 hectares (2.56%) in 1986 to 1,21,435 hectares (4%) in 1999 is mainly due to the increasing the road/rail/canal side plantations as well as the plantations on wastelands. The inter-se conversions are given in Table 17.7.

Table 17.7: Conversion of Forests cover

Areas converted from different uses to Forests		Forests converted into different uses		Net increase in forest
Use	Area (in Hectares)	Use	Area (in Hectares)	Area (in Hectares)
1	2	3	4	5
Agriculture	72,000			
Others	2,200			
		Wastelands	29,700	
		Water bodies	100	
		Built-up	600	
Total	74,200		30,400	43,800

17.2.3 Comparative Analysis of proposed Land Use Regional Plan-2001 and Existing Land Use 1999

NCR

A comparative analysis of existing land use 1999 and the proposed land uses of Regional Plan-2001 (refer Table 17.8) indicates that at the level of NCR, substantial urbanisable areas to the extent of 43,150 hectares (61%) was still un-built in 1999. This clearly indicates the comparatively low level of development specially in the Priority towns of NCR. On the other hand, the areas proposed to be kept as green belt have been reduced and eaten up by urban sprawl, specially in Delhi where out of the total post 1986 urbanised area of 14,800 hectares, 8,900 hectares (60%) had been built-up within the green belt proposed in Regional Plan-2001.

Table 17.8: Comparative Analysis of Land Use 1999 and Proposed Land Use 2001 of NCR

Land Use	Area (in Hectares)	
	1999	Proposed Regional Plan-2001
1	2	3
Urbanisable areas	27,570	70,720
Green Belt/Green wedge	2,62,590	3,01,000
Recreation	11,010	13,240
Sanctuaries and others	12,320	12,460

One of the important recommendations of Regional Plan-2001 was to increase the forest cover from 2.56% in 1986 to 10% in 2001. This was proposed to be achieved through conversion of entire wastelands i.e., 6.14% into forest. However, the 1999 Imagery indicated that hardly any wasteland had been converted into forest, which in fact increased from 6.14% to 6.63%.

17.2.4 Dynamics of Change of Land Use in Policy Zones Regional Plan-2001

The Land Use Plan 2001 included in the Regional Plan-2001 had indicated the direction and extent of urbanisable area for Priority and CNCR towns. As emerged from the analysis of Satellite data of 1999,

broad development status and general growth pattern of the priority towns in relation to the land use plan of Regional Plan-2021 are as under:

a) NCT-Delhi

The land use of 1999 indicates that the built-up area of NCT-Delhi increased from 56,727 hectares in 1986 to 70,162 hectares in 1999, which is more than 47% of the total area of NCT-Delhi. As per Regional Plan-2001 the existing urban and urbanisable area was planned for 62,777 hectares against which the urbanisable area/built-up area was 60,836 hectares. In addition, 9,326 hectares had also been built-up outside the urbanisable area.

b) Central NCR

- (i) Ghaziabad-Loni has its built-up area closer to NCT-Delhi and large area has been developed outside the urbanisable area particularly towards NCT-Delhi and Noida, while a large portion of urbanisable area falling in between Ghaziabad-Meerut highway and NH24 is lying un-built.
- (ii) Noida has achieved its physical target and its built-up area has almost covered the entire urbanisable area. In the north, it has reached to the NH24 bypass and in south it has extended beyond the Export Promotion Zone.
- (iii) Gurgaon has extended its urban spread up to the NCT-Delhi boundary. It has also covered substantial portion of its urbanisable area earmarked in the Regional Plan-2001.
- (iv) The urbanised area of Faridabad had already merged with NCT-Delhi. Faridabad has also made good progress in achieving its physical target. It is observed that a substantial area has been developed particularly the areas beyond the Agra canal in the east and the stretch in between Agra canal and NH1 in the south.
- (v) The urbanisable limit of Bahadurgarh has reached with NCT-Delhi particularly along the NH10.

c) Area beyond Central NCR

1) Haryana Sub-region

- (i) In Haryana Sub-region, Panipat, Rohtak, Rewari, Palwal had been identified as Priority Towns in Regional Plan-2001. The built-up area of Panipat has increased on the eastern side of the NH1 and to the north in between NH1 and Drain No. 2. Substantial area has been developed on the Panipat-Jind road along the Drain No. 2 and the NCR boundary, which are beyond the urbanisable limit. In case of Rohtak, the development has taken place on the Delhi-Rohtak road towards south-east. The development of Rewari has taken place towards south-west and east while large portion of urbanisable area on north-western part remaining undeveloped.
- (ii) In the case of Palwal, the development has taken place towards Faridabad i.e., north and substantial urbanisable area has been developed.
- (iii) In the case of Sonapat, the development has remained within the earmarked urbanisable limit. There is insignificant development in the Dharuhera.

2) Rajasthan Sub-region

In Rajasthan Sub-region, Alwar and Bhiwadi are the two Priority towns identified as such for induced development. From the land use change analysis, it is observed that Alwar has moderately

achieved its target and its development mostly confined within the urbanisable limit of the Master Plan except in the south of Alwar town where no development was envisaged, some development has come up. In case of Bhiwadi, substantial area has been built-up.

3) U.P. Sub-region

- (i) In the U.P. Sub-region, Meerut, Hapur, Bulandshahr and Khurja had been identified as Priority towns in the Regional Plan-2001. The urbanisable area of Meerut remained undeveloped, except few patches adjoining its urbanised areas have developed. It was also observed that few small patches along the Delhi-Meerut road and Meerut-Muzaffarnagar road have developed beyond the urbanisable limits.
- (ii) In the case of Hapur, Bulandshahr and Khurja area, the development activities remained almost within the earmarked urbanisable area.
- (iii) However, large tracts of urbanisable areas within the priority towns of Meerut, Hapur, Bulandshahr and Khurja are still un-built.

17.3 ISSUES

17.3.1 Large-scale Conversion of Agricultural Land to Non-Agricultural Use

The land use analysis indicates that from 1986 to 1999, the land under agriculture shrank by 8.12% i.e., from 87.64% to 79.52%. This drop of 8.12% is considerable when compared with the proposed drop of only 3.8% (87.64% to 83.84%) stated in Regional Plan-2001. This has resulted not only into over-conversion of agriculture into non-agriculture land but also non-conformity with the proposed settlement pattern of the Regional Plan-2001.

17.3.2 Unauthorised Conversion of Land Use

In the absence of proper legislation to control the land uses outside the controlled areas/development/regulated areas, the conversion of non-urbanisable area into urban uses specially industries has been continuing unabated in the areas which was otherwise supposed to remain agriculture/green belt/green wedge specially along the transport corridors.

17.3.3 Lack of Urban-Rural Continuum in Regional Development

Though the Regional Plan suggested a broad policy for development of selected centres for acting as nuclei for rural development, however, in the absence of a coordinated development strategy for the rural areas, the Regional Plan-2001 has remained urban biased.

17.3.4 Unplanned/haphazard Growth in Environmentally Sensitive Areas

The satellite imageries have shown that environmentally fragile and sensitive areas such as Yamuna riverbed/wetland, ridge areas, forest areas are being subjected to developments authorisedly and unauthorisedly.

17.3.5 Green Belts/Green Wedges

The provision of green belt/green wedges as protected belts to arrest undesirable growth provided in Regional Plan-2001 is conceptually ideal. Since most of the land ownership under the green belt is in private hands, it is practically difficult to prevent the owners from putting these lands to other more economic uses.

17.4 POLICIES AND PROPOSALS

At the Regional plan level, land use may be guided and regulated in selected areas and the other areas will be dealt in the lower hierarchy plans i.e., Sub-regional Plans and Master/Development Plans. Such areas of concern may be (i) those pockets where the development pressure is quite high or (ii) various kinds of natural areas which have to be conserved (e.g. ridge, river beds and banks, lakes, wild life and bird sanctuaries, forests, etc.) and (iii) pockets of planned green areas including green wedges, buffers, open spaces and parks, to be used as regulatory instruments for ensuring an over all physical form with adequate lung spaces judiciously located every where, from densely built core to peripheral areas of the open countryside.

Accordingly, four major land use zones and three sub-zones have been identified (Map 17.2 National Capital Region: Proposed Land Use 2021) and policies and proposals for each of the zones are as follows:

- a) Controlled/development/regulated zone
- b) Highway corridor zone
- c) Natural conservation zone
- d) Agricultural (Rural) zone outside controlled /development/regulated areas.

17.4.1. Controlled/Development/Regulated Zone

The controlled/development/regulated zone marked in the proposed Land Use Plan 2021 is under intense pressure of development. The activities within this zone will have to be effectively controlled and monitored. For this purpose while all the controlled areas/development areas declared by the respective State Governments from time to time within the preview of their own acts will be deemed as controlled/development/regulated zone. No development in the controlled/development/regulated zones can be undertaken except in accordance with the Master/Development Plans for the respective controlled areas approved by the Board and duly notified by the State Governments under their respective acts.

Within the controlled/regulated zones there will be three sub-zones, whose precise delineation will be undertaken by the respective Master/Development Plans for the controlled/development/regulated areas but have largely been indicated in the proposed Land Use Plan 2021.

(a) Urbanisable Areas (including existing Built-up/urban areas)

Density norms proposed in Regional Plan-2001 are as follows:

Table 17.9: Density Norms proposed in Regional Plan-2001

S. No.	Urban Centres	Persons per hectare
1	2	3
a)	Up to 1.0 lakh population	80
b)	1.0 lakh to 5.0 lakhs population	110
c)	More than 5.0 lakhs population	125

Realizing the fast urbanisation in the region, review of Regional Plan-2001 suggested for modification in the density norms. Accordingly, after a careful examination of the existing density norms being followed by the constituent States, the following density norms, suggested for Regional Plan-2021, are given in Table 17.10.

The existing and proposed built-up areas have to be regulated and guided by their Master/Development Plans and Local Area Plans including Village Development Plans within the framework of Regional Plan-2021 and Sub-regional Plans-2021. On the basis of the assigned population for the year 2021, new areas may be identified as development promotion zones and detailed Master/Development Plans may be

prepared by the respective State Governments, as per zoning regulations in para 17.5 of the Regional Plan-2021.

Table 17.10: Density Norms suggested in Regional Plan-2021

S. No.	Urban Centres	Persons per hectare
1	2	3
a)	Below 50,000 population	60 to 80
b)	50,000 to 1 lakh population	80 to 100
c)	1 lakh to 5 lakhs population	110 to 125
d)	5 lakhs to 10 lakhs population	125 to 150
e)	10 lakhs to 50 lakhs population	150 to 200
f)	More than 50 lakh population	200 to 250

Respective State Governments would elaborate the details of land uses, its phasing for development and zoning regulations in the Sub-regional Plans and Master/Development Plans while preparing them. Phasing of land use development would be done for the year 2011 and 2021.

While preparing the Master/Development Plans for the towns, it is to be ensured that proposed development should not be permitted in the natural conservation zones, planned green areas, agriculture areas, ground water recharging areas and water bodies. Land also be reserved for the activities such as disposal of solid waste generated from the respective towns, town level utility services (such as power plant, grid station, water and sewage treatment plants etc.) dairy farming, horticulture, inter and intra-urban transport system, etc.

Attempt be made to rationalize the quantum of land required for each urban activity while preparing the Master/Development Plan of towns. In case of Delhi, as per the draft Master Plan for Delhi-2021, the entire NCT-Delhi has been proposed as urbanisable area except a green belt of one revenue village depth wherever available along the NCT-Delhi boundary. While finalizing MPD-2021, the natural conservation zone/environmentally sensitive areas including flood plains of river Yamuna to be planned as per the policies mentioned in paras 8.3.4, 8.3.5, 13.1.3, 14.2 (viii) and 17.4.3 (iii) of this Plan. The required land for the activities cited above be earmarked in the Master Plan for Delhi-2021.

(b) Agriculture (Rural) Zone within controlled/development/regulated areas

Agriculture (Rural) zone within the controlled/development/regulated areas of urban centres provided in the Master/Development Plans of the respective controlled/development areas be strictly adhered to. No activities other than those defined in the zoning regulations to the Regional Plan-2021 will be permitted.

(c) Green buffers

Green buffers along the expressways, national highways, state highways and railway lines or around/adjacent to any other area, as provided in the regulated zone along major transport corridors and other areas be maintained and regulated as per the provisions of the respective State acts/Master/Development Plans. These green buffers will be outside urbanisable limits of towns and the zoning regulations for the green buffers will be applicable within and outside the controlled/regulated areas.

The green buffers along the transport networks within this zone will have the following minimum widths on either side of the 'right of way' (ROW), which may be increased if required in the respective Master/Development Plans by the State Governments.

No activities other than those permitted in the Zoning Regulations of the Regional Plan-2021 will be permitted in the green buffers. Where the prevailing State acts provide for a different width, these acts would be suitably amended to incorporate the widths provided in the Regional Plan-2021.

Table 17.11: Green Buffers along Transport Networks

Transport Network	Distance from the either side of ROW (in Metres)
1	2
Expressways/Bypass	100
National Highway	60
State Highway	30
Railway line	30

17.4.2 Highway Corridor Zone

In order to control the large-scale urban development along the important highways in the Region, outside the controlled/development/regulated areas, a regulated zone is provided, within which necessary planned development can be undertaken by the State Governments after taking into account the restrictions of green buffers spelt out in the Regional Plan. However, before planning this area, it be declared as controlled/development/regulated area and a Development/Master Plan will be prepared by the respective State Governments with the approval of the NCR Planning Board and duly notified. The width of these corridors outside the existing controlled areas be minimum 500 metres on either side of the ROW of the highways, as indicated in the proposed Land Use Plan 2021. The actual boundaries of the highway corridor zone will be delineated based on the revenue village boundaries by the respective State Governments in the Sub-regional Plans. The highways, where this restriction will be applicable, have been identified in Chapter 3.

17.4.3 Natural Conservation Zone

The major natural features, identified as environmentally sensitive areas, are the extension of Aravalli ridge in Rajasthan, Haryana and NCT-Delhi, forest areas, the rivers and tributaries of Yamuna, Ganga, Kali, Hindon and Sahibi, sanctuaries, major lakes and water bodies such as Badkal lake, Suraj Kund and Damdama in Haryana Sub-region and Siliserh lake in Rajasthan etc. These areas have been demarcated as Natural Area Conservation Zone in the Regional Plan-2021. Similarly, ground water recharging areas such as water bodies, ox-bow lakes and paleo-channels have also been identified (refer Map 8.1). These areas be further detailed out in the Sub-regional Plans and Master/Development Plans and the broad policies for these zones which are as under be incorporated appropriately in them and be further elaborated and implemented:

- (i) The extension of the Aravalli ridge, sanctuaries and other ecologically sensitive areas be conserved with utmost care and afforested with suitable species. The development in this area be in accordance with the notifications issued for such areas by the Ministry of Environment and Forests under the Environment (Protection) Act, 1986 from time to time.
- (ii) In view of the very low existing forest cover (4.02%), it is imperative to bring more areas under forest so as to maintain the ecological balance in this region. Accordingly, all wastelands identified in the existing Land Use 1999 and proposed Land Use Plan 2021, ROW of irrigation canals, drains, roads, railway lines and village common lands are proposed to be brought under forest cover. The total forest cover proposed to be 10% of the total area of the region.
- (iii) The areas under water bodies, ox-bow lakes and paleo-channels and their surrounding areas as shown in the Ground Water Rechargeable Areas in Map 8.1/Land Use Plan 2021 in Map 17.2 be kept free from any encroachment/development to allow free flow of water. Construction activities for human habitation or for any other ancillary purpose thereto not be permitted. Suitable measures be taken to maintain the water bodies with the minimal flow/water level.

- (iv) In the flood prone areas/river beds/banks, no construction or habitation activities be permitted. Flood Protection Plan be prepared by the concerned State Governments/agencies. Policies proposed in the Disaster Management chapter at para 15.3 be further elaborated in the Sub-regional Plans, Master/Development Plans and Flood Protection Plans.
- (v) Detailed Conservation Plans be prepared for the areas shown as Natural Area Conversation Zone in the Land Use Plan 2021.
- (vi) The monuments/man-made heritage sites and conservation heritage areas be identified in the Master/Zonal Plans of each town and detailed conservation plans be prepared for their protection and conservation.

17.4.4. Agricultural (Rural) Zone outside Controlled/Development/Regulated Areas

Agricultural (Rural) Area of NCR has to be regulated and guided by Village and Block Plans to be drawn under the district planning process. At the regional level, agriculture (rural) zone be designated for primary sector production and as open areas comprising of farmlands, orchards and pastures etc.

The new employment opportunities in non-agriculture sector and consequent concentration of population, the urban expansions would have to be largely made from the agricultural land and other non-urban uses. Therefore, there would be a major impact on land requirements of agriculture sector. In view of this, following policies have been proposed:

- (i) Existing cultivated land be conserved for agriculture use as far as possible. Efforts be made to increase the production through intensive cultivation by providing irrigation facilities and other necessary infrastructure.
- (ii) Measures be initiated for protection of prime agricultural land and ensure its needless conversion into non-agricultural/urban use.
- (iii) Utilisation of less and least valuable land for urban expansion/new urban centres/development purposes.

17.5 ZONING REGULATIONS

Keeping in view rapid urbanisation, environmental degradation and to ensure orderly development in the region, a legislative tool in the form of Zoning Regulation is required. In view of this, four broad zones have been identified for application of strict land use control and development and enabling preparation for detailed Plans such as Sub-regional/Master/Local Area Plans. The elaboration of the land use details and zoning regulations would be incorporated in the Sub-regional Plans and Master/Development Plans by the respective State Governments. Four broad zones and major activities/uses permitted in these zones are given below:

17.5.1. Controlled/Development/Regulated Zone

(a) Urbanisable Areas (including existing built-up/urban areas)

Within the urbanisable area proposed in the Master/Development Plan of the respective towns, the functions and uses designated as under be continued:

- i) Residential
- ii) Commercial
- iii) Industrial

- i) Government offices, public and semi-public
- ii) Recreational
- iii) Utility services
- iv) Transport and communications
- v) Open spaces, parks and playgrounds
- vi) Graveyards/cemeteries and burning ghats
- vii) Man-made heritage areas
- viii) Natural heritage areas/eco-sensitive areas/conservation areas

The local authority according to the prescribed uses in the Master/Development Plans will govern detailed land uses within the urbanisable area. The Master/Development Plans of all the towns will be prepared within the framework of the Regional Plan-2021 and Sub-regional Plans. In case any amendment is required in the acts to implement the policies of Regional Plan-2021 that be done by the respective State Governments appropriately.

(b) Agriculture (Rural) Zone within Controlled/Development/ Regulated Areas

- 1) Agricultural, horticultural crops and cash crops
- 2) Dairy and poultry farming including milk chilling station and pasteurization plants
- 3) Social forestry/plantations including afforestation
- 4) Non-polluting industries registered as RSI/SSI units subject to one of the following conditions:
 - (i) Located within half kilometer belt encircling the existing village *abadi* and approachable from a public road/*rasta* other than scheduled road, national highways and state highways.
 - (ii) On public road/*rasta* not less than 30 feet wide other than scheduled roads, national highways and state highways outside the half kilometre zone referred to in (1) above up to a depth of 100 metres along the approach road.
- (5) Non-polluting agro-based industries on public roads/revenue *rasta* not less than 30 feet wide other than scheduled roads, National Highway and State Highway.
- (6) The site should not fall within 900 metres restricted belt around defence installations.
- (7) Land drainage and irrigation by hydro-electric works and tube well for irrigation
- (8) Sanitary landfill, compost processing plant and other such activity sites with adequate protected belt as prescribed in the CPHEEO Manual of the Ministry of Urban Development and Poverty Alleviation and the notifications issued by the Ministry of Environment and Forests from time to time.
- (9) Mining and extraction operations including lime and brick kilns, stone quarries and crushing subject to the rules and approved site.
- (10) Bus queue shelter and railway station
- (11) Airports with necessary buildings
- (12) Wireless Station

- (13) Grain godowns, storage spaces at site approved by competent authority
- (14) Weather station
- (15) Telephone and electric transmission lines and poles
- (16) Cremation and burial grounds
- (17) Fuel filling station, Service stations and repair workshops
- (18) Power plant/sub-station/water works/treatment plants and other utility services
- (19) Storage godowns for inflammable petroleum products such as LPG, petrol, diesel, kerosene, aviation turbine fuel, light diesel oil and other petroleum products and lubricants with the approval of the competent authority
- (20) Village houses within *abadi-deh*.
- (21) Farm houses outside *abadi-deh*, and
- (22) Expansion of existing village contiguous to *abadi-deh* including social institutions like schools, dispensaries, veterinary centres and police posts strictly for the requirements of the village and located within 500 metres of the *abadi-deh*, if undertaken as a project approved or sponsored by the Central Government or State Governments.
- (22) Recreational/tourist facilities not more than 4.5 metres height, FAR not exceeding 5% of the plot areas.

(c) Green buffers

- i) Approach/service roads
- ii) Agriculture and horticulture
- iii) Social forestry/plantations including afforestation
- iv) Fuel filling stations with amenities like toilets, STD booths, small repair shop, small tea/soft drink and snack bar (with no cooking facility)
- v) Toll Plaza, bus queue shelters, police booth, first aid centres and telephone booth

17.5.2 Highway Corridor Zone

The Highway Corridor Zone will have to be notified as controlled/development/regulated area and Master/Development Plans will have to be prepared by the respective State Governments. In the Highway Corridor Zone (excluding green buffers along highways, activities permitted in ‘urbanisable area’, ‘agriculture zone within development/controlled/regulated areas’ and the ‘green buffers’ prescribed in paras 17.5.1(a), 1(b) and 1(c) of Zoning Regulations will be permitted through Master/Development Plans. Access to the expressways and highways will be regulated by the competent authority.

17.5.3 Natural Conservation Zone

In this zone the following uses activities may be permitted:

- i) Agriculture and horticulture
- ii) Pisciculture

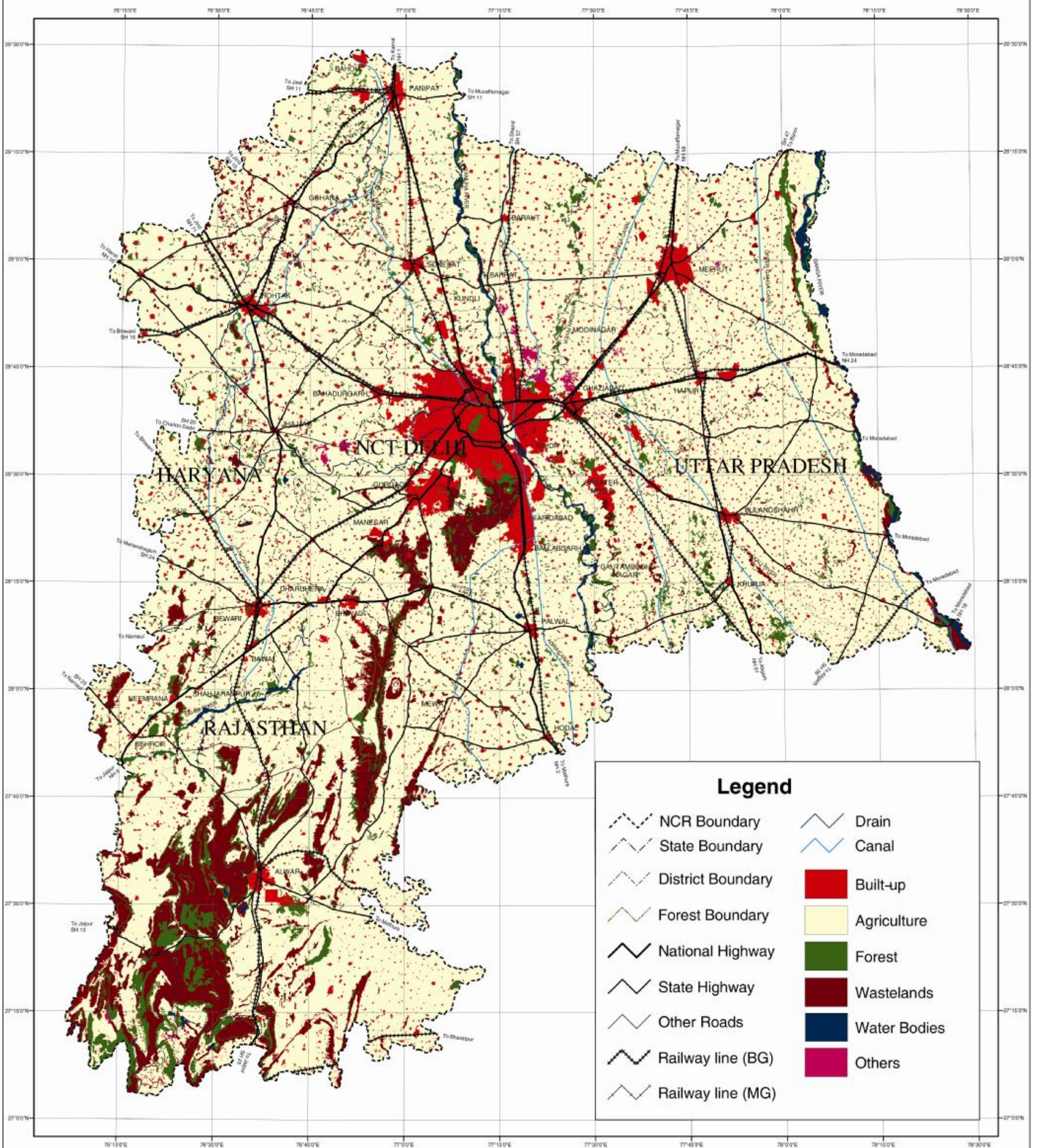
- iii) Social forestry/plantations including afforestation.
- iv) Regional recreational activities with no construction exceeding 0.5% of the area with the permission of the competent authority.

17.5.4 Agriculture (Rural) Zone outside Controlled/Development/Regulated Areas

In the agriculture (rural) area zone outside controlled/development/regulated areas the following activities/uses may be permitted in addition to the activities/uses permitted in the “agriculture zone within controlled/development/regulated area” as indicated in para 17.5 1(b):

- i) Intensive agriculture and allied activities such as dairying and poultry farming
- ii) Afforestation specially on the wastelands and barren lands
- iii) Regional recreational uses such as, regional parks, wildlife sanctuary etc.
- iv) Cemeteries, schools, hospitals, etc.
- v) Quarrying
- vi) Brick kilns
- vii) Existing village *Mandis*/agricultural markets
- viii) Rural industries
- ix) Farm houses

NATIONAL CAPITAL REGION LAND USE 1999



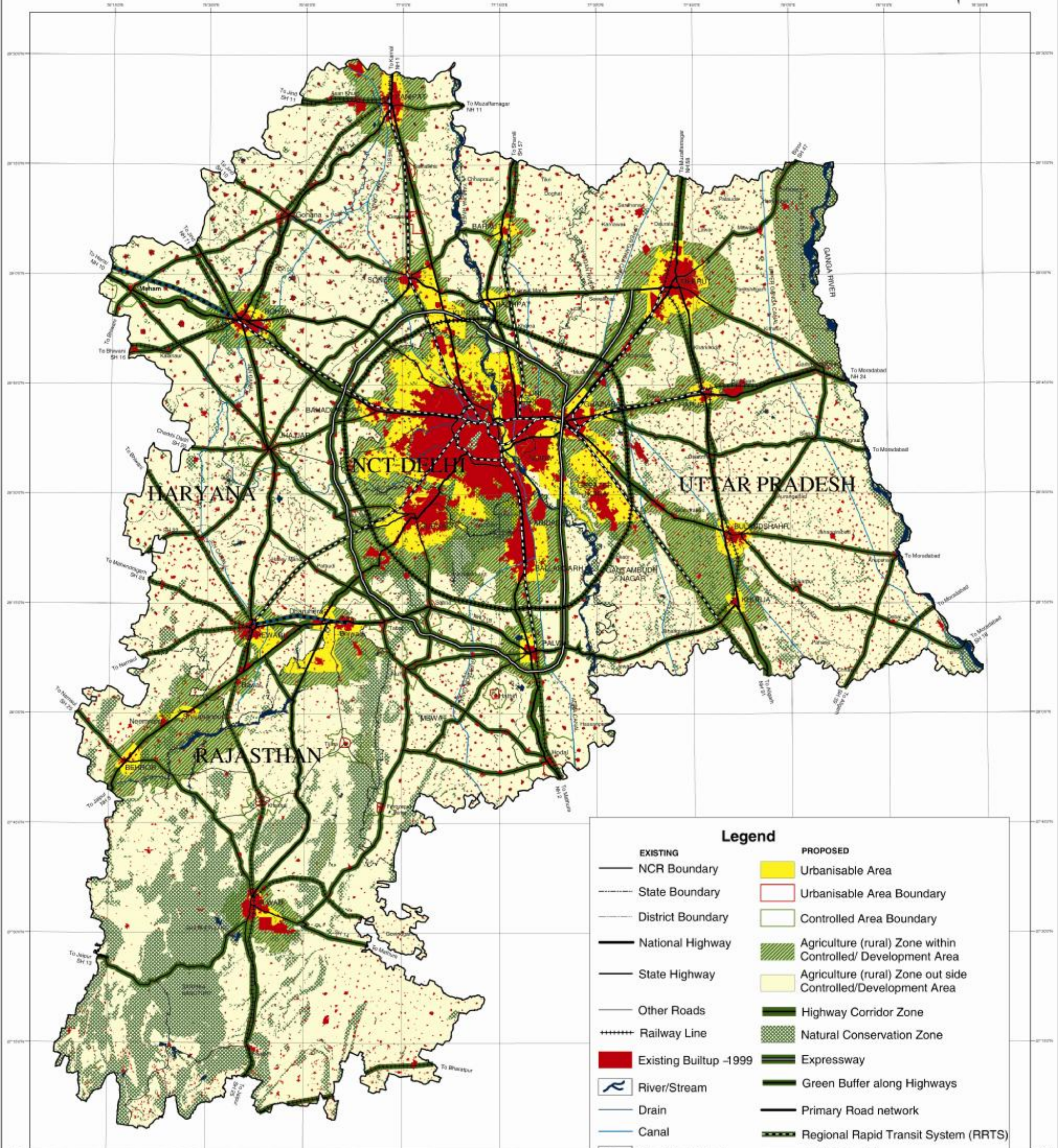
Legend

	NCR Boundary		Drain
	State Boundary		Canal
	District Boundary		Built-up
	Forest Boundary		Agriculture
	National Highway		Forest
	State Highway		Wastelands
	Other Roads		Water Bodies
	Railway line (BG)		Others
	Railway line (MG)		

NATIONAL CAPITAL REGION PLANNING BOARD
MAP 17.1

Source: Urban Sprawl and Land use/ land cover Mapping for NCR by NRSA.

NATIONAL CAPITAL REGION PROPOSED LAND USE 2021



EXISTING	PROPOSED
— NCR Boundary	Urbanisable Area
--- State Boundary	Urbanisable Area Boundary
--- District Boundary	Controlled Area Boundary
— National Highway	Agriculture (rural) Zone within Controlled/ Development Area
— State Highway	Agriculture (rural) Zone out side Controlled/Development Area
— Other Roads	Highway Corridor Zone
+++++ Railway Line	Natural Conservation Zone
Existing Builtup -1999	Expressway
River/Stream	Green Buffer along Highways
Drain	Primary Road network
Canal	Regional Rapid Transit System (RTTS)
Lake/Tank/Pond	Orbital Corridor
	Proposed Rail Link
	Green Buffer along Railway Line

NOTE:-

1. THIS MAP INDICATES BROAD LAND USES FOR NCR 2021 AD WHICH WOULD BE SUPPLEMENTED BY SUB-REGIONAL PLANS FOR THE RESPECTIVE SUB-REGIONS AND MASTER/DEVELOPMENT PLANS FOR METRO CENTRES AND REGIONAL CENTRES FOR THEIR POPULATION ASSIGNED IN THE REGIONAL PLAN FOR THE PERSPECTIVE YEAR 2021 AD BY THE PARTICIPATING STATES AND NCT-DELHI.
2. THE PROPOSED URBANISABLE AREAS AS SHOWN ON THE MAP FOR METRO CENTRES AND REGIONAL CENTRES ARE APPROXIMATE AND THE URBANISABLE LIMITS WOULD BE GOVERNED BY PROPOSALS OF THE STATUTORY MASTER PLANS /DEVELOPMENT PLANS/NEW MASTER PLANS AND DEVELOPMENT PLANS IN FORCE. DETAILS OF LOWER HEIRARCHY OF SETTLEMENTS WILL BE IDENTIFIED IN THE SUB-REGIONAL PLANS AND THEIR LANDUSES WILL BE AS SHOWN IN THE MASTER PLANS/DEVELOPMENT PLANS/NEW MASTER PLANS/DEVELOPMENT PLANS IN FORCE.
3. THE AGRICULTURE (RURAL) AREAS WITHIN THE CONTROLLED AREAS AROUND URBANISABLE AREAS AS SHOWN ON THE MAP ARE APPROXIMATE AND WOULD BE GOVERNED BY THE PROPOSALS OF SUB-REGIONAL PLANS & THE STATUTORY MASTER PLANS/DEVELOPMENT PLANS.
4. THE GREEN BUFFERS WILL BE 100 METRES ON EITHER SIDE OF EXPRESSWAYS/BYPASS, 60 METRES ON EITHER SIDE ON THE NATIONAL HIGHWAYS, 30 METRES ON EITHER SIDE ON THE STATE HIGHWAYS AND RAILWAY LINES.
5. THE BOUNDARIES OF CONSERVATION ZONES i.e. FOREST COVER, BIRD & WILD LIFE SANCTUARIES, RIDGE, RIVER BED & FLOOD PLAINS ARE TENTATIVE AND SHALL BE IN ACCORDANCE WITH THE SUB-REGIONAL PLANS/MASTER /DEVELOPMENT PLANS/NOTIFICATIONS OF MOE&F THEREOF.
6. ALIGNMENT OF EXPRESSWAYS, RTTS & ORBITAL RAIL CORRIDOR SHOWN ON THE PLAN ARE TENTATIVE.

10 5 0 10 20 30 40 50 Kms

**NATIONAL CAPITAL REGION PLANNING BOARD
MAP 17.2**

18

COUNTER MAGNET AREAS

18.1 BACKGROUND

Section 8(f) of the NCR Planning Board Act, 1985 empowers the Board to select, in consultation with the State Governments concerned, any urban area outside NCR having regard to its location, population and potential for growth, which may be developed as Counter-Magnet Area in order to achieve the objectives of the Regional Plan.

Conceptually Counter-Magnet Areas (CMAs) to NCR, as envisaged in Regional Plan-2001, should be such urban areas as may be located sufficiently away from NCR and, should have its known established roots and inherent potentials to function as viable independent growth foci. Such identified Counter-magnets would have the attributes of physical, social and economic viability, nodality with respect to transportation network and have the quality of physical linkages in the form of transportation and communications facilities.

18.2 ASSIGNED ROLE OF COUNTER-MAGNET AREAS IN REGIONAL PLAN-2001

The role of Counter-magnets as envisaged in Regional Plan-2001 was to play two distinctive and mutually complementary roles in the context of NCR:

- a) As interceptors of migratory flows into NCR, which may escalate, as the accelerated development of NCR would provide a pull to migrants from the less developed adjoining areas;
- b) As regional growth centres, which would be able to achieve a balanced pattern of urbanisation in the region of their own setting over a period of time.

18.3 IDENTIFICATION OF COUNTER-MAGNET AREAS IN REGIONAL PLAN-2001

Keeping in with the objectives of the NCR Planning Board Act, 1985 initially 36 cities falling within the range 100-400 kms from Delhi were considered and analysed in respect of their size and status, population growth, work force participation ratio, population density and the spatial parameters like accessibility, congruence with immigration corridors and proximity to other contenders in the region. Based on the analysis of these parameters and after discussions and consultations with the State Governments, the following urban centres were recommended as possible contenders for further scrutiny to decide the counter-magnet areas:

- a) Hissar, Yamuna Nagar, Ambala and Karnal in Haryana
- b) Gwalior in Madhya Pradesh
- c) Patiala, Bhatinda and Ludhiana in Punjab

- d) Kota, Sikar and Ajmer in Rajasthan
- e) Bareilly, Moradabad, Saharanpur and Allahabad in Uttar Pradesh

In the interest of balanced directional spilt, the following centres were finally selected as counter-magnets to NCR by the Board (Map 18.1 National Capital Region: Counter Magnet Areas):

- 1) Hissar in Haryana
- 2) Gwalior in Madhya Pradesh
- 3) Patiala in Punjab
- 4) Kota in Rajasthan
- 5) Bareilly in Uttar Pradesh

18.4 POLICY GUIDELINES OF REGIONAL PLAN-2001

Development of Counter-Magnet Areas would require coordinated efforts of the State and Central Governments and the National Capital Region Planning Board. The broad policy guidelines for development of Counter-Magnet Areas in terms of the role to be played by the respective Governments and the Board have been stipulated in Regional Plan-2001. The State Governments/implementing agencies proposed to prepare integrated development programme for the Counter-Magnet Areas for strengthening the economic base functions and upgradation of physical and social infrastructure. The concerned State Governments proposed to take steps to strengthen organisational capacities of the local bodies/development authorities in the counter-magnet cites and provide adequate financial resources for development. The Central Government and NCR Planning Board proposed to provide financial assistance for strengthening of regional linkages (transport and communications etc.) for development of counter-magnet towns.

Respective State Governments were required to take the following actions in order to make the CMAs eligible for assistance from the NCR Planning Board:

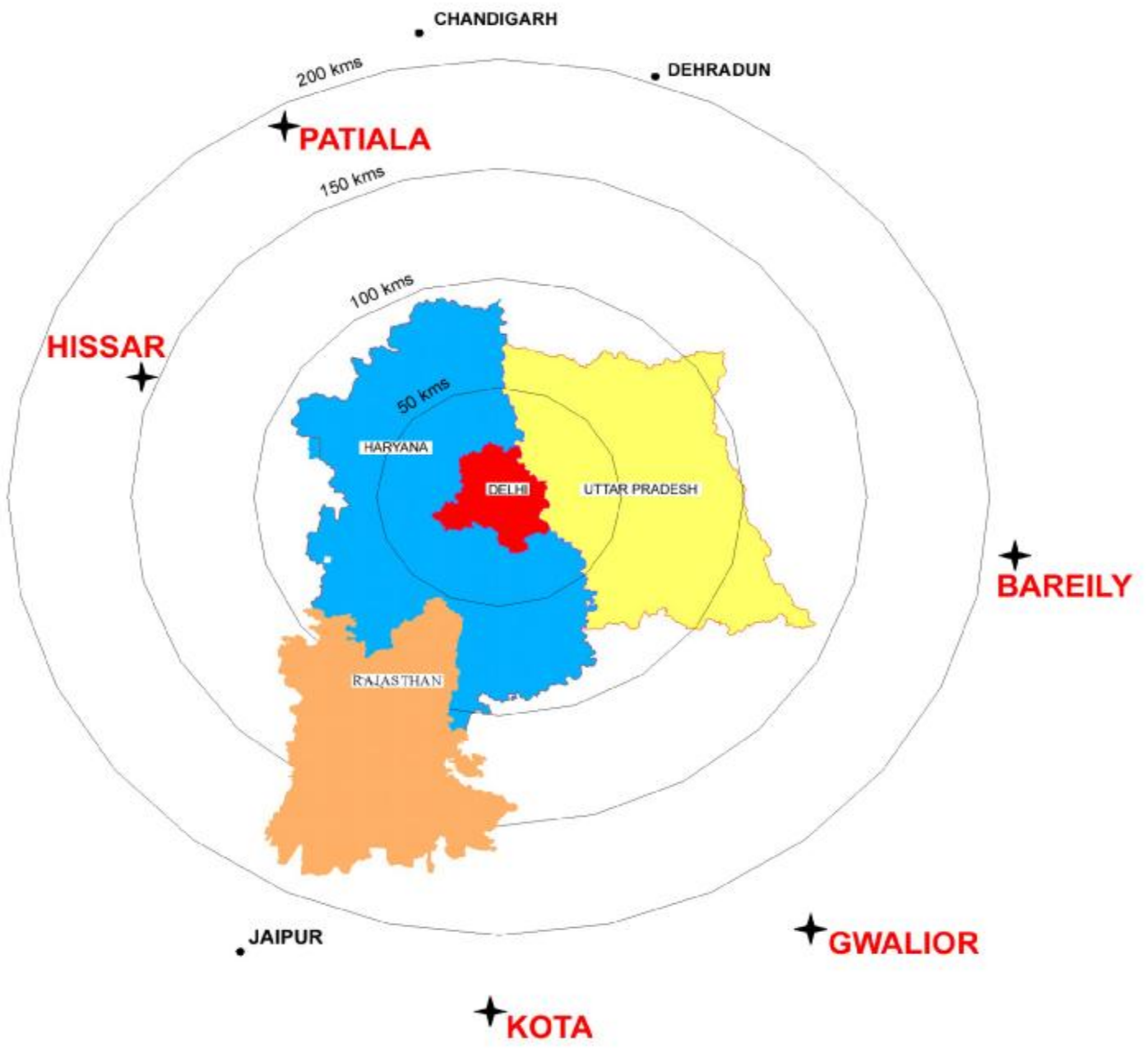
- i) Finalisation of the Development Plan for the counter-magnet town.
- ii) Constitution of Project Sanctioning Committee at the town level.
- iii) Preparation of Annual Action Plan.
- iv) Allocation by the State Government of its matching share in the Development Fund for the counter-magnet areas.

18.5 STATUS OF DEVELOPMENT OF COUNTER-MAGNET AREAS

A review of five Counter-Magnet Areas proposed in the Regional Plan-2001 suggested that the policies of the Plan should be to divert migration streams away from Delhi to the identified Counter-Magnet Areas with urbanization potential because any induced population growth in NCR would lead to the accelerated rate of growth of population of Delhi.

In most of the cases, the State Governments did manage to take the required actions referred to in the foregoing para in respect of the Counter-Magnet Areas. The counter-magnet towns of Gwalior and Patiala have so far availed of maximum loan assistance of Rs.61 crores and Rs.42.48 crores respectively followed by Bareilly at Rs.20 crores. Kota has obtained only a marginal loan assistance of Rs.2 crores and Hissar has not yet taken any loan assistance.

NATIONAL CAPITAL REGION COUNTER-MAGNET TOWNS



LEGEND

Counter Magnet Town ✦

 NATIONAL CAPITAL REGION PLANNING BOARD
MAP 18.1

18.6 ANALYSIS OF CMA DEVELOPMENT

The analysis of development of the CMAs during the tenure of Regional Plan-2001 has brought out the following observations:

- (i) The Counter-magnets have not played the assigned role in reducing the flow of migrants from the respective States to Delhi largely due to distance factor and paucity of funds allocated for their development.
- (ii) In order to pursue the policy of development of counter-magnets in a more effective manner, it is suggested that more than one such settlement be identified in UP, in consultation with the State Government, from where 49% migrant come to Delhi.

18.7 PROPOSALS AND RECOMMENDATIONS

Based on the review of the Regional Plan-2001 on Counter-Magnets, it is important to pursue the policy of development of counter magnets in a more effective manner. Therefore, it is suggested that more than one such settlement be identified in UP, in consultation with the State Government, from where about 49% migrant come to Delhi.

Further in order to make the counter-magnets capable to undertake their assigned roles more effectively, their future development must be directed to cover the following aspects:

a) Strengthening of Economic Base Functions

The success of the counter-magnets as interceptors of migration entirely depends upon their capacity to generate more and more economic activities so that they can provide adequate opportunities to the working-age group population of the surrounding areas, who would otherwise be tempted to migrate to Delhi. The counter-magnet areas may be declared as Special Economic Zone (SEZ) for attracting economic investment therein and projects be taken up jointly by the State Governments and the Central Ministry of Commerce and Industry. Simultaneously, other physical infrastructure and fiscal incentives could be provided so as to attract industry to these Counter-Magnet Areas.

b) Upgradation of Physical and Social Infrastructure

In order to support and sustain the economic infrastructure suggested in the counter-magnet areas, physical and social infrastructure of a very high order needs to be provided in these areas for which the Counter-Magnet Area Development Authorities and the State governments will have to prepare joint projects which could be financially supported by the NCRPB through its prevailing funding pattern for NCR areas.

Specialized social, cultural and institutional activities like universities and centre of higher education i.e., professional colleges could be established as well as encourage development of tourist destinations.

c) Strengthening of Regional linkages

In order to make meaningful use of the economic and physical infrastructure proposed to be developed in these counter-magnet areas, their linkages with the hinterland as well as with the other important metropolitan centres need to be very strong. The Central Ministries of Railways, Shipping, Road Transport and Highways as well as Communications and Information Technology will have to put in a lot of effort in improving the transport and communication linkages in these counter magnet areas in a planned manner within a specified time frame.

19

IMPLEMENTATION STRATEGIES, MANAGEMENT STRUCTURE AND RESOURCE MOBILISATION

The Committee which reviewed the Regional Plan-2001 had observed that the practice of piecemeal and ad hoc decisions for development should be stopped and the programme needs to be prepared with a time schedule and phasing.

Keeping these observations in view, the strategies for the Regional Plan-2021 have been formulated and tailor-made to suit implementation of different policies proposed in the Plan. The first kind of Strategy is related to the policy implementation by identifying the agencies responsible to implement the same through the provisions in their own acts and rules. The second strategy is related to the preparation of a plan of action for infrastructure up-gradation in the region, its costing and phasing for its implementation along with dovetailing these costs with five-year plans. It is also envisaged that there will be an active role of the private sector in implementation of various projects as envisaged in the Regional Plan-2021.

19.1 IMPLEMENTATION STRATEGIES

As stated above, the strategies for each sector such as demography and settlement pattern, economic base, rural development, regional landuse, environment, disaster management and heritage and tourism has been detailed out in the Table at Annexure 19/I, which also identifies the various implementing agencies that would be responsible for implementing the policies and strategies identified therein. Strategies for upgradation of civic infrastructure in the region along with the plan of action, identification of the agencies for its implementation and dovetailing the phasing with five-year plans has been proposed which have been detailed out in Tables at Annexures 7/I, 8/II and 9/II. This includes sectors such as power, water, sewerage, solid waste management, etc.

The strategy on demography and settlement pattern emphasizes on dovetailing the population assignments of the identified settlements as envisaged in the Regional Plan-2021 with the Sub-regional/District/Master Plans. It would be the primary responsibility of the concerned State governments and the development authorities who are preparing these Plans to work out the detailed strategies and assign the functions etc., as per the assigned population for the planning of the town's future requirements. The population assignment would be further reviewed and modified if required based on the Census 2011 data and further projections. The table given at Annexure 19/I, identifies the broad policies and the strategies for all the sectors along with the agencies responsible for implementing them.

The strategy proposed in the plan for developing wholesale markets in Delhi to meet its own requirements is in the interest of Delhi. Decentralization of economic activities is essential. Alternative wholesale markets be developed in the region outside Delhi by the concerned agencies of the respective State Governments as joint venture projects.

With regards to the policy on decentralization of industries from NCT-Delhi, it is emphasized that only hi-tech industries be allowed within NCT-Delhi and in the existing industrial areas. Low-tech industries

be transformed into hi-tech and those which are unable to do so, be phased out to be relocated outside NCT-Delhi. Sub-regional Centres should develop phase wise industrial areas and the State Government concerned should provide adequate incentives for the setting up of units in these places. The Industrial development authorities/corporations of the concerned State Government will prepare industrial lay out plans and will dovetail the concerned industrial policies of the State and the directions of the State Pollution Control Board.

There is a need to rationalize the tax structure, extend uniform financial and banking services, remove restriction of interstate movement of taxis and auto rickshaws, to provide uniform telecom facilities and uniform power supply, to have an integrated education policy and finally also to have an integrated law and order machinery. This rationalization would ensure the balanced development in the entire National Capital Region. The concerned Ministries of the Government of India and the State Government would be responsible to implement the respective policies within a time frame.

One of the major problems faced in the implementation of the Regional Plan-2001 was the conversion of agricultural land into non-agricultural uses at random. A serious note has been taken with regard to this menace in the Regional Plan-2021.

The regional land use policy 2021 also addresses the issues of natural conservation, high development pressure, etc. and their details would be reflected in the Sub-regional Plan and Master Plan of the concerned States and towns by the respective state governments. As an important step towards preservation of natural features such as ridges, rivers, streams, paleo-channels, etc., a minimum distance from the edge of any of the natural feature be demarcated permanently as a 'No Development Zone' at the Sub-regional and local levels in consultation with the Department of Environment and Forests, Central Ground Water Board, offices of the concerned State Departments and NCRPB. This would ensure not only preservation of natural resources but would also maintain the ecological balance in the area.

The Regional Plan-2021 has also placed emphasis on rural development, disaster management and heritage & tourism development wherein the local government would prepare such Plan converging it with the available resources and by giving priorities which can be incorporated in the District Development Plans. It is necessary for all development authorities/municipal corporations to provide detailed guidelines in their Development Control Rules for disaster management.

Emphasis has been given to improve the connectivity and overall infrastructure in the region. Among the infrastructure, transportation networks are the most important which will in the long run help in decentralizing the economic activities, which is at present concentrated in NCT-Delhi. As a matter of fact, efficient transportation system will also help in development of residential and commercial colonies outside NCT-Delhi urban area. Therefore, in view of the above, Peripheral and Ghaziabad-Meerut expressways has been proposed. The access to these Expressways will be provided from the major roads through interchanges with partial control on access. Primary network identified in the Plan is proposed to be upgraded to at least four lane divided carriageway immediately and they are further to be widened depending upon increase in the traffic volume in phased manner. In addition, a Regional Rapid Transit System connecting NCT-Delhi with major towns in the region for the commuter travel has been proposed. This will involve either laying of two additional dedicated tracks or strengthening of the existing railway network.

In the power sector, future demand of power for the region has been projected as 34,444 MW by the year 2021 and policies have been suggested to improve/augment power generation and transmission & distribution in the region. It is proposed that an islanding scheme for NCR as second level of island after NDMC/Delhi will be prepared by the CEA and State power utilities concerned after revisiting the system which will be implemented by the concerned power utility companies for better load management. State

Governments concerned will also carry out periodic audit for identification of technical and commercial losses, which will help in improving the transmission and distribution system on a regular basis. A Sub-group in the Northern Region Electricity Board be created for NCR by the Ministry of Power to oversee the power supply issues in the NCR and make recommendations regarding quality and reliability of power supply in the region.

In the water sector, in order to improve the overall situation of the drinking water supply in the region a blue print for water resources in the region and an integrated regional scheme has been proposed to be prepared to augment drinking water supply in the region. Total drinking water demand in the region by the year 2021 will be about 12,000 mld. Apart from this, norms and standards, identification of land areas for ground water recharging and policies for their protection, recycling of waste water for non-drinking uses, relocation of water consuming industries, commercial approach for tariff, creation of mass awareness, quality of water etc. have been proposed.

Policies and strategies for improvement of sewerage system and its treatment facility, solid waste management, drainage and irrigation have been proposed.

In the Regional Plan, a plan of action for implementation of infrastructure policies & proposals and their dovetailing with five-year plans has also been proposed. Implementation of these policies and proposals will improve the overall quality of life in the region and will help in balanced and harmonized development in the region.

19.2 MANAGEMENT STRUCTURE

In order to implement the above mentioned policies and strategies, it is required to have an efficient management system for speedy implementation of the Plan proposals and for proper monitoring of the projects. The management structure and role of each body can be as follows:

NCRPB Level

The NCRPB Act, 1985 stipulates various functions of the Board. The major functions are to prepare the Regional Plan and Functional Plans and to arrange for preparation of the Sub-regional Plans at the Sub-regional level and Project Plans by the State Governments and their implementing agencies and through concerned Central Ministries. The Board also is responsible to create a centralized database, to engage itself as partner in Joint sector/Joint venture projects and to monitor the implementation of policies and proposals of Regional Plan-2021, Functional Plans, Sub-regional Plans and Project Plans which are being implemented by constituent States and concerned Central Ministries.

State/NCR Cell Level

The role of the State Government is governed by the activities listed in the State list and further it will support the State NCR Cell and the implementing agencies by providing adequate resources of all types and their State policies be dovetailed with the Policies of the Regional Plan.

The Role of State Governments/NCR Cell will be as follows:

- i) Preparation of Sub-regional Plan-2021 and Master Plans.
- ii) Ensure/coordinate preparation of district plans as per the provisions of Regional Plan-2021.

- iii) Ensure preparation of Master Plans for water, sewerage, solid waste and drainage for all the towns in the Sub-regions.
- iv) Project Planning and Monitoring of NCRPB funded Projects.
- v) Ensure implementation of policies related to Common economic zone as detailed out in Regional Plan-2021.
- vi) Ensure implementation of Regional Plan-2021 policies & proposals, Sub-regional Plan and other Plans prepared as per the provisions of Regional Plan-2021.
- vii) Ensure preparation of Sub-component Plans for various sectors in the State budget.
- viii) Ensure preparation and implementation of Rural development Plans.
- ix) Creation of Database and ME System at Sub-regional Level.
- x) Creation of Policy and Planning Group.

State Departments and Agencies Level

The role of State departments and other implementing agencies will be:

- i) To get the District Plans prepared in consonance with the Regional Plan-2021 and the Sub-regional Plan and in accordance to the 73rd and 74th Constitutional Amendments.
- ii) To ensure preparation of Master Plans for all towns for the perspective of 2021.
- iii) To Prepare Master Plans for water supply, sewerage and solid waste management at town level.
- iv) To ensure preparation of Projects and proposals as per directions in Regional Plan-2021, Sub-regional Plans and Master Plans and implement the same.

Central Ministries Level

The role of the Central Government will be more of a supportive nature by providing adequate resources of all kinds at all levels. They will also be responsible for:

- i) Preparation and implementation of Sub-component Plan in conformity with the Regional Plan-2021.
- ii) Ensuring implementation of the policies, proposals and projects highlighted in the Regional Plan-2021.

Issues and Policies

- i) With its limited powers and jurisdiction, the NCRPB cannot take up the task of comprehensive management of implementation of the Regional Plan. It, therefore, requires the support not only from the Ministry of Urban Development but also from other Central Ministries, Planning Commission and constituent State Governments, their local bodies etc. who are having power under their own jurisdiction.

- ii) In order to have an effective monitoring at the State level, it is suggested that Secretary, Urban Development and In-charge of the NCR Cell should be responsible to coordinate among all the agencies at the State level for implementing the schemes as proposed in the Regional Plan-2021.
- iii) It is proposed that a Sub-regional Area Development Authority be created for overall planning and development of urban and rural areas at the Sub-regional level. In this context, it is also proposed that the State Government concerned to amend their acts/rules for creating such an Authority.
- iv) The implementation of Regional Plan requires a multi-disciplinary approach, which involves tremendous amount of coordination and monitoring not only of the policies and strategies of the Regional Plan but also the physical verification of the change of landuse cases approved by the Board and monitoring of the projects funded by the NCRPB. Since the total area of the National Capital Region is 33,578 sq kms, creation of adequate database which needs to be regularly updated as well, becomes a herculean task, thereby it has become very difficult to coordinate and monitor with the meagre technical staff available in the Board's office.

At present, there is one Chief Regional Planner, head of the Technical wing and is assisted by three Joint Directors, two Deputy Directors, five Assistant Directors, one Planning Assistant and one Tracer. Since the role of the NCRPB is well defined, there is a need to strengthen it from technical manpower point of view. Now, it is proposed to have one Chief Regional Planner, one Additional Chief Regional Planner, four Joint Directors (Technical), eight Deputy Directors (Technical), sixteen Assistant Directors (Technical), four Planning Assistants and two Draughtsman (Grade-III)/Technical Assistants. Details of sanctioned strength, proposed strength and additional required strength of officers have been given in Annexure 19/II. Based on the strengthening of the technical staff, the requirement of support staff in finance and administration wings will have to be strengthened adequately.

- v) As a facilitative step and also as an incentive to motivate the private sector entrepreneurs to be involved in the development programmes in the NCR, it would be necessary for the public sector to take the lead in the implementation of at least certain preliminary stages of regional infrastructure, like road and rail network, assembling land for expressways, social infrastructure of higher educational and medical institutions, shelter, and provide essential support facilities like R&D and policy regulations. This would possibly help the private sector to step in and establish economic infrastructure of industrial, trading and commercial activities and handle the construction, operation and management segments of various infrastructure components.
- vi) Though normally it would be expected that the projects envisaged to be funded through private sector are remunerative enough and capable of generating sufficient reinvestible surpluses, it may be possible that a few components of projects may not give sufficient returns on their own to become commercially viable. Such project components with comparatively lower FIRR's may have to be clubbed together with other project components which may have higher rate of returns so that the composite profits of the two could make the whole project viable. As an example, the expressways proposed to be taken up through the private sector on BOT basis in the NCR may not yield a very high return simply on the basis of user charges alone i.e., toll rates and, for improving their FIRR's, development rights for certain additional pockets of land may have to be provided.
- vii) For encouraging the private sector to actively involve in the development programmes in the NCR and in order to sustain their continued participation, a climate of mutual trust and cooperation with their counterpart public agencies are pre-requisites.

Immediate steps are therefore required for:

- Evolving stable and transparent official policies for entry and functioning of private enterprises in a competitive environment
- Establishing single window system for processing official clearances for development projects
- Adopting independent regulatory mechanisms
- Creating modalities for expeditious settlement of disputes between private and official agencies involved in the development projects
- Setting up machinery for quick redressal of grievances of targeted beneficiaries (consumers) of various project components

The following components could be undertaken by the private sector, some of them exclusively and some others jointly with the Central and State agencies.

- Acquisition and development of land
- Industries and wholesale trade
- Social infrastructure, local and trunk services
- Construction of block housing
- Construction of expressways
- Mass transport system
- Power generation
- Power transmission and distribution
- Telecom services

19.3 RESOURCE MOBILISATION

The most important element required for achieving success of a Plan is the availability of the resources. Financing of various projects is critical to the success of the NCR Plan. It is necessary to have large investments in infrastructure such as transportation, power, water and telecom and also in social sectors such as health and education.

Funds for development activities in the NCR are available mainly from four sources:

- a) NCRPB assisted projects, the Board provides loan up to 75% of the cost of the project.
- b) State Government projects are implemented by various development authorities, local bodies, housing boards, industrial development corporations etc.
- c) Projects funded by Central Ministries such as Railways, Communications and Information Technology, Shipping, Road Transport and Highways etc. and
- d) Private sector investment in infrastructure.

The funds available with the Board are from the following sources:

- a) Grant from the Ministry of Urban Development
- b) Contribution from Delhi Government
- c) Market borrowing (Taxable and Tax-free bonds)
- d) Internal accruals (Interest income)

The resources became available to the Board through various sources are as summarised below:

Table 19.1: Resource mobilization by NCR Planning Board (Rs. in Crores)

Five-year/ Annual Plans	Plan outlay (sought)	Plan allocation	Plan Funds released by Central Government	GNCT-Delhi Contribution	Bonds/Line of Credit*	Loan Released
1	2	3	4	5	6	7
7th Plan	200.00	35.00				
1985-86			3.90	--	--	3.75
1986-87			4.25	--	--	4.00
1987-88			6.00	--	--	7.23
1988-89			7.92	--	--	9.36
1989-90			7.60	--	--	9.20
Sub-total			29.67			33.54
Annual Plans	22.25	22.25				
1990-91			10.00	--	--	12.02
1991-92			12.25	--	--	21.14
Sub-total			22.25		--	33.16
8th Plan	640.00	200.00				
1992-93			10.00	--	--	8.87
1993-94			20.00	3.50	--	15.78
1994-95			25.00	3.00	--	14.18
1995-96			40.00	3.50	--	109.75
1996-97			40.00	3.75	60.00	146.85
Sub-total			135.00	13.75	60.00	295.43
9th Plan	800.00	224.00				
1997-98			42.00	15.00	226.40	84.27
1998-99			45.00	20.00	285.00	206.81
1999-2000			42.00	30.00	--	238.45
2000-01			45.00	30.00	152.40	159.57
2001-02			50.00	25.00	234.75	271.91
Sub-total			224.00	120.00	898.55	961.01
10th Plan	3000	350.00		#250.00		
2002-03		55.00	55.00	--	--	110.86
2003-04		52.00	52.00	30.00	--	274.08
2004-05		55.00	61.70	30.00	--	275.72
Sub-total		162.00	168.70	60.00	0.00	660.66
Total		162.00	579.62	193.75	958.55	1983.80

* Out of total loan from capital market in the form of private placement of Bonds of Rs. 898.55 crores, balance of Rs. 387.15 crores is outstanding as on date and the rest has been redeemed.

Rs.250 approved by GNCT-Delhi against demand for Rs 580 crores for the Tenth Plan

However, from the above, it is clear that there have been resource constraints with NCRPB in financing large-scale projects in the region due to which the regional infrastructure envisaged in the Regional Plan-2001 could not be implemented. In view of the resource constraints with the NCRPB in financing development programmes in the region and in the light of the existing modalities of jointly funded projects, the NCRPB do not have the facility of providing any financial assistance to its constituent states as grant.

Issues and Strategies

Special Component Plan

A comprehensive view of the fund available from all the sources is required to be taken so as to integrate development activities undertaken by various agencies. Without a mechanism of dedicated fund, it would not be feasible to effectively undertake various activities envisaged in the Regional Plan. This can be achieved to a considerable extent through a 'Special Component Plan'. There should be a mechanism of 'Special Component Plan' for the NCR to be established as a part of five-year plans prepared by the

Planning Commission. The requisite fund should be allocated by the Planning Commission as a Sub-component of the plan in respect of Central Ministries of Shipping, Road Transport and Highways, Railways, Communications and Information Technology and Power as well as the participating States of the NCR. However in order to achieve these objectives, all Central Ministries and the participating States have to go beyond their token approval to the Plan. They have to recognise the Regional Plan-2021 as their own Plan and accept the responsibility of implementing its policies, projects and proposals through their physical and financial effort, reflecting it in their five-year and annual plans and work programmes.

Further, it is imperative that more innovative mechanism of resource generation are explored in addition to normal budgetary support and IEFR, so that the envisaged development programmes could be implemented within a reasonable time-frame.

As the system of funding based on Plan allocations has to be minimized under the new policy regime and the demand for financial resources by the priority sectors may not permit the Central government to enhance the Plan allocations significantly for the development of NCR, alternative innovative instruments for mobilizing resources for the projects envisaged in the Regional Plan-2021 will have to be explored. In recent years, the Central Government has provided several fiscal incentives to help mobilisation of resources for urban infrastructure development. These include permitting the issuance of tax-free Municipal Bonds, broadening the definition of infrastructure to include urban infrastructure such as water supply and sanitation, removing restrictions on Foreign Direct Investment in urban infrastructure, and encouraging externally assisted urban sector projects. The Ministry of Urban Development and Poverty Alleviation issued on 08.02.2001 guidelines for tax-free Municipal Bonds.

It is recommended that market based funds through accessing the capital market and the involvement of the private sector by making the projects commercially viable should be resorted to in the financing of urban infrastructure in the NCR. This is, however, contingent on effective urban management that could be amenable to fairly good credit rating and offering suitable fiscal concessions to the investors in the debt instruments.

There exists enough scope to enhance revenue generation from the existing local taxes. Tax administration in almost all the states in the country is constrained by

- (i) not-so-effective tax administration and
- (ii) difficulties encountered in administration of the major tax-the Property Tax.

The maladies in tax administration relate to lack of proper assessment of demand, billing and collection. Tax collection and generation of additional revenue could be ensured through a scheme of incentives and penalties for municipal staff and the taxpayers.

Land as Resource

Urban land is a highly valuable asset that should be very judiciously used to raise resources by the implementing agencies to fund the repayment of loans taken for initial development and for funding future development programmes. Even the private sector projects in the NCR towns are likely to derive large benefits because of the overall NCR development and hence a considerable value would be added to their assets. It is therefore, desirable that a part of this net value addition should be recovered in the form of development/betterment charges and use the same for funding further development programmes in the region by loading it on to the land cost.

Optimal utilization of land through appropriate pricing and distribution mechanisms and land use control measures can yield substantial surpluses for the Area Development Authorities for undertaking additional development works.

Some of the methods through which land could be used as a viable resource for financing various urban development programme in the region are as follows:

- a) Creation of land banks by the public agencies for utilization for future requirements
- b) Permitting the private sector to develop the land and recovering a part of the value added on account of such permitted development
- c) Granting of transferable development rights (TDR), funding of infrastructure projects on innovative methods like BOT, BOLT, BOOT etc. by providing land as initial input
- d) Permitting commercial use of precious land by the private sector and deriving returns in the form of social housing/development for the occupants of that land
- e) Recycling of land for facilitating the shifting/relocation of industries units located thereon, etc.

User Charges

Amongst the non-tax sources, the user charges happen to be the most important mechanism of cost recovery. Water supply, sewerage, urban transport, solid waste collection and parks qualify for imposition of user charge. The economic rationale of cost recovery entails that the user charges have to be based on the unit cost of providing a service. In actual practice, however, the municipal governments are not recovering even the maintenance cost. Urban Local Bodies do not levy user charges that recover at least the operations and maintenance costs due to political as well as consumer pressures.

Private Sector

Private sector entrepreneurs should be motivated to get involved in the development programmes in the NCR as discussed in the management structure. In order to sustain their continued participation, a climate of mutual trust and cooperation with their counter-part public agencies should be created.

Restructuring and Reforms

Access to infrastructure and private finance cannot be sustained on a piecemeal, project-by-project basis. Internationally, it is being increasingly recognized that the sustainability of infrastructure development is ultimately determined by the overall management and creditworthiness of urban centers. International experience also suggests that the success of Central and State fiscal transfers into the urban sector is dependent on the efficiency of cities themselves. Reforms in institutional, fiscal and economic systems of cities will be necessary to achieve the management efficiency and credit-worthiness that will sustain a long-term programme of infrastructure investments based on private finance while ensuring the effective utilisation of public funds. Wherever citywide reform is not feasible, systematic reforms focused on critical services, like water and sanitation, is an equally important option. Such systematic reforms in selected sectors would have to be centered on significant private sector participation in the management, financing and delivery of services. Without these reforms at the citywide level or specific sectoral level, it would not be possible to ensure the inflow of private investment in urban infrastructure.

1. CONSTITUTION OF THE BOARD

The National Capital Region Planning Board was constituted on the 28th March 1985 under the provisions of National Capital Region Planning Board Act, 1985. The Board under the chairmanship of the Union Minister of Urban Development has 21 members of the re-constituted Board and the 10 co-opted members. The composition is as under:

Union Minister of Urban Development, Government of India	Chairman
Union Minister of Power, Government of India	Member
Union Minister of Communications and Information Technology, Government of India	Member
Union Minister of Railways, Government of India	Member
Union Minister of Shipping, Road Transport and Highways, Government of India	Member
Chief Minister, Government of Haryana	Member
Chief Minister, Government of Rajasthan	Member
Chief Minister, Government of Uttar Pradesh	Member
Lieutenant Governor, National Capital Territory of Delhi	Member
Chief Minister, Government of National Capital Territory of Delhi	Member
Minister of State for Urban Development, Government of India	Member
Minister of Town and Country Planning, Government of Haryana	Member
Minister of Urban Development, Government of Rajasthan	Member
Minister, Urban Development, Government of Uttar Pradesh	Member
Chief Secretary, Government of National Capital Territory of Delhi	Member
Chief Secretary, Government of Haryana	Member
Chief Secretary, Government of Rajasthan	Member
Secretary, Ministry of Urban Development, Government of India	Member
Secretary, Housing and Urban Development, Government of Uttar Pradesh	Member
Chief Planner, Town and Country Planning Organization, Government of India	Member
Member Secretary, National Capital Region Planning Board	Member Secretary

Co-opted Members

Chief Minister, Government of Madhya Pradesh

Chairman, Railway Board, Government of India

Principal Advisor (HUD), Planning Commission, Government of India

Secretary, Department of Industrial Policy and Promotion, Ministry of Commerce and Industry, Government of India

Secretary, Ministry of Shipping, Road Transport and Highways, Government of India

Secretary, Department of Expenditure, Ministry of Finance, Government of India

Secretary, Department of Power, Government of India

Secretary, Department of Urban Development and Housing, Government of Punjab

Secretary, Department of Urban Development and Housing, Government of Madhya Pradesh

Vice-chairman, Delhi Development Authority

2. FUNCTIONS OF THE NCR PLANNING BOARD

Under Section 7 of the NCR Planning Board Act, 1985, the functions of the Board are:

- (a) to prepare the Regional Plan and the Functional Plans;
- (b) to arrange for the preparation of Sub-regional Plans and Project Plans by each of the participating States and the Union Territory;
- (c) to coordinate the enforcement and implementation of the Regional Plan, Functional Plans, Sub-regional Plans and Project Plans through the participating States and the Union Territory;
- (d) 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 ;
- (e) to arrange for and oversee the financing of selected development projects in the National Capital Region through Central and State Plan funds and other sources of revenue.

The Board is further empowered to coordinate and monitor the implementation of the Regional Plan and to evolve harmonised policies for control of land uses and development of infrastructure in the National Capital Region so as to avoid any haphazard development of the region. 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 or their authorized implementing agencies. 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 Board, under the provisions of the Section 4 of NCR Planning Board Act, 1985, constituted a committee called the Planning committee for assisting the Board in the discharge of its functions. The composition is as under:

Member Secretary	NCR Planning Board		Chairman
Joint Secretary	Ministry of Urban Development dealing with Housing and Urban Development	}	Members
Secretary	In-charge of Urban Development, Haryana In-charge of Urban Development, Rajasthan In-charge of Urban Development Uttar Pradesh In-charge of Urban Development NCT-Delhi		
Vice-chairman	Delhi Development Authority		
Chief Planner	Town and Country Planning Organization		
Director	Town Planning Department, Haryana		
Chief Town Planner	Government of Rajasthan		
Chief Town Planner	Government of Uttar Pradesh		
Representative each	from Ministries of Shipping, Road Transport and Highways, Communications and Information Technology, Railways, Department of Power, Department of Environment	}	Co-opted Members
Representative	Planning Commission		
Chairman-cum-Managing Director Chief Regional Planner	HUDCO NCR Planning Board		

1. STUDY GROUPS

Following are the study groups constituted for preparation of Regional Plan-2021:

NCR Policy zones, demographic profile and settlement pattern

Regional land use and rural development

Physical infrastructure including transport and communications

Utility and service infrastructure including power, water, sewerage, solid waste, drainage, irrigation etc.

Social infrastructure including education, health, shelter, recreation, law and order etc.

Environment including tourism, heritage, pollution, disaster management etc.

Institutional Framework

Economic and Fiscal Policy including resource mobilisation, funding etc.

2. MEMBERS OF THE STUDY GROUPS AND SUB-GROUPS

Study Group I: NCR Policy zones, demographic profile and settlement pattern Members

- | | | |
|--|--|--|
| <p>1. Shri D.S. Meshram (Chairman)
Former Chief Planner, TCPO,
107, Dhruva Apartments, I.P.Estate,
New Delhi</p> | <p>5. Deputy Registrar General,
Census of India, Man Singh Road,
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Addl. Commissioner (Planning),
Delhi Development Authority,
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New Delhi.</p> |
| <p>2. Dr. R.B. Singh,
Department of Geography,
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North Campus, Delhi</p> | <p>6. Chief Coordinator Planner (NCR),
Town and Country Planning Department,
Government of Haryana,
Sector 18A, Chandigarh,
Haryana</p> | <p>10. Late Shri K.A. Reddy, (Convener)
Joint Director, NCRPB
(Up to October 2001)</p> |
| <p>3. Dr. S .K. Kulshrestha,
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New Delhi</p> | <p>7. Chief Town Planner (NCR),
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| <p>4. Prof. Krishna Gopal,
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Town and Country Planning Department,
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Navyug Market, Ghaziabad</p> | <p>12. Shri Manmohan Singh, (Co-convener)
Deputy Director, NCRPB
(Up to May 2001)</p> |
| | | <p>13. Ms. Anjali Pancholy, (Co-convener)
Assistant Director, NCRPB</p> |

Co-opted Members

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| <p>1. Shri M. L. Chotani,
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| <p>2. Dr. R. P. Singh,
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Census of India,
West Block-1, R.K. Puram, New Delhi</p> | <p>4. Shri Abdul Qaiyum,
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Shalimar Bagh, New Delhi</p> | <p>6. Shri Kshirsagar,
Town and Country Planner,
Town and Country Planning
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I.P. Estate, New Delhi</p> |

Sub-group 1: NCR Policy zones

Sub-group 2: Demographic profile

Sub-group 3: NCR settlement pattern

Study Group II: Regional land use and rural development

Members

- | | | |
|--|--|--|
| <p>1. Prof. H.B. Singh, (Chairman)
School of Planning and Architecture,
New Delhi</p> <p>2. Prof. Padma Vasudevan,
Indian Institute of Technology,
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Head-Landuse, NRSA,
Government of India, Hyderabad</p> <p>4. Prof. (Ms.) Atiya Habib,
Jawahar Lal Nehru University,
New Delhi</p> <p>5. Prof. Kavas Kapadia,
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Chief Planner, TCPO, New Delhi</p> <p>7. Shri U. K. Srivastava,
Chief Town Planner
NCR Planning Cell, Rajasthan</p> <p>8. Shri S. K. Zaman,
Chief Coordinator Planner,
NCR Planning Cell, UP</p> <p>9. Shri R. C. Aggarwal,
Chief Coordinator Planner,
NCR Planning and Monitoring Cell,
Haryana</p> <p>10. Shri Chandra Bhallabh,
Additional Commissioner,
Delhi Development Authority, New Delhi</p> | <p>11. Shri Chandu Bhutia,
Associate Town and Country Planner,
NCR Planning Cell, Government of NCT-Delhi</p> <p>12. Shri J. N. Barman, (Convenor)
Joint Director, NCRPB</p> <p>13. Shri S. Surendra, (Co-convenor)
Deputy Director, NCRPB</p> |
|--|--|--|

Co-opted Members

- | | | |
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| <p>1. Prof. Shovan Saha,
School of Planning and Architecture,
New Delhi</p> <p>2. Shri S.C. Gupta,
School of Planning and Architecture,
New Delhi.</p> | <p>3. Dr. A. Panneerselvam,
School of Planning and Architecture,
New Delhi</p> <p>4. Prof. S. Suneja,
School of Planning and Architecture,
New Delhi,</p> | <p>5. Prof. Mahavir,
School of Planning and Architecture,
New Delhi,</p> <p>6. Shri Manu Bhatnagar,
Advisor-NHD, INTACH, New Delhi</p> |
|--|---|--|

Sub-group 1: Regional land use

Sub-group 2: Rural development

Study Group III: Physical infrastructure including transport and communications

Members

- | | | |
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| <p>1. Dr. P.K. Sikdar, (Chairman)
Director, Central Road Research Institute,
Mathura Road, New Delhi</p> <p>2. Shri P.S. Rana,
Director, Corporate Planning, HUDCO,
India Habitat Centre, Lodhi Road, New Delhi</p> | <p>3. Prof. A. K. Sharma,
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Chief Engineer, (Traffic and Transportation),
Ministry of Surface Transport,
Transport Bhawan, New Delhi</p> <p>5. Shri Anurag Mishra, CTPM,
Northern Railway, Railway Board,
Rail Bhawan, New Delhi</p> |
|---|---|--|

- | | | |
|---|---|--|
| <p>6. Shri S.K. Jain,
Executive Director (Metro Project),
Railway Board, Rail Bhawan,
New Delhi</p> <p>7. Ms. Geeta Banerjee,
Director,
Telecom (Long Term Planning),
Department of Telecommunications,
Sanchar Bhavan, New Delhi</p> <p>8. Shri A.K. Bhargava,
Executive Director (Technical),
TCIL, TCIL Bhawan, G.K.1-48, Delhi</p> <p>9. Shri Vijay Risbud,
Commissioner (Planning),
Delhi Development Authority,
Vikas Minar, I. P. Estate, New Delhi</p> <p>10. Shri I.M. Singh,
Engineer-in-Chief, PWD,
Government of NCT Delhi,
Kasturba Gandhi Marg, New Delhi</p> | <p>11. Shri G. Sharan,
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New Delhi</p> <p>12. Shri U.K. Srivastava,
Chief Town Planner (NCR),
Town and Country Planning Department,
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Nagar Niyojan Bhawan,
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C/O Chief Administrator,
HUDA Office, SCO, Sector – 6,
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Joint Director, NCRPB</p> <p>17. Shri Utpal Deka, (Co-convenor)
Assistant Director, NCRPB
(Up to June 2001)</p> <p>18. Shri Dinesh Arora, (Co-convenor)
Assistant Director, NCRPB</p> |
|---|---|--|

Study Group IV: Utility and service infrastructure including power, water, sewerage, solid wastes, drainage, irrigation etc.

Members

- | | | |
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| <p>1. Shri O.P.Chadha, (Chairman)
Former Chief Engineer, PHED-Haryana,
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Jamnagar House, New Delhi</p> <p>4. Shri S.N. Kataria,
Director (UT Division),
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Raj Nagar, Ghaziabad, U.P.</p> <p>6. Shri S.K. Kulshreshtha,
Chief Engineer,
Public Health Engineering Department,
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|--|--|---|

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Co-opted Members

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2, Civil Lines, Near Railway Hospital,
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2. Shri S.K. Huria,
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3. Shri P.K. Jain (Retd.),
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Sub group 1: Power

13. Shri U.K. Srivastava,
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17. Shri S. K. Rohilla (Co-convenor)
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8. Chief Engineer (Ganga),
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Study Group V: Social infrastructure including education, shelter, recreation, law and order etc. Members

1. Shri Vinay D. Lall, (Chairman)
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3. Prof. (Dr.) Amitabh Kundu,
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4. Prof. J.H. Ansari,
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5. Dr. S.K. Aggarwal,
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Delhi University, Delhi
6. Ms. Madhu Shree Majumdar,
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7. Shri U.K. Srivastava,
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8. Shri R.C. Aggarwal,
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Co-opted Members

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2. Shri Chandra Ballabh,
Addl. Commissioner, MP- 2021 Unit,
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9. Shri S.K. Zaman,
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10. Shri Chandu Bhutia,
Associate Town and Country Planner,
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Vikas Bhawan, I.P. Estate, New Delhi
11. Mr. V.K. Thakore, (Convenor)
Joint Director, NCRPB

3. Dr. (Ms.) Stuti Lall,
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4. Shri Tanmay Kumar,
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5. Shri Manjeet Singh,
Additional Commissioner
(Slum and Wing), Slum and J.J. Wing
Vikas Kutir, I.P. Estate, New Delhi

12. Shri P. Sisupalan, (Co-convenor)
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13. Ms. Anjali Pancholy, (Co-convenor)
Assistant Director, NCRPB

6. Shri Sabir Ali
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Lodhi Road, New Delhi
7. Dr. Ashok Kumar
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8. Shri Ajay Suri
Associate Professor
Society for Development Studies
India Habitat Centre, New Delhi

Sub-group 1: Review of Regional Plan-2001

Sub-group 4: Education, medical, security, PDS and other social infrastructure

Sub-group 2: Informal settlements

Sub-group 3: Housing

Sub-group 5: Database, monitoring and evaluation system

Study Group VI: Environment including tourism, heritage, pollution, disaster management etc.

Members

- | | | |
|--|---|--|
| <ol style="list-style-type: none"> 1. Prof. A.K. Maitra, (Chairman)
Director,
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Parivesh Bhawan,
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Professor Emeritus,
EE-1, 72/6, Civil Lines,
University of Roorkee, Roorkee 4. Member Secretary,
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Ministry of Tourism,
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9. Shri. T. C. Gupta,
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1. Dr. S. Mukherjee,
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2. Dr. A.K. Sinha,
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4. Shri B.K. Jain,
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11. Chief Coordinator Planner (NCR),
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8. Shri S.C. Gupta,
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10. Director,
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11. Shri J.K. Prashad,
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13. Shri Chandu Bhutia,
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14. Shri Rajeev Malhotra, (Convenor)
Joint Director, NCRPB
15. Shri Suresh K. Rohilla, (Co-convenor)
Assistant Director, NCRPB
13. Shri Raghu Babu,
CPCB
14. Ms. Sanjukta Bhaduri,
Assistant Professor,
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15. Ms. Meenakshi Dhote,
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16. Shri Anand Kumar,
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17. Shri Ajay Raghav,
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18. Shri Sidharath Yadav,
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19. Ms. Meenakshi Singh,
Project Associate,
ENVIS Centre on Human Settlements, SPA

Sub-group 1: Environment**Sub-group 2: Heritage and tourism****Sub-group 3: Disaster management****Study Group VII: Institutional Framework Members**

1. Shri K.C. Shivramakrishnan, (Chairman)
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President,
Institute of Town Planners India,
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3. Prof. G.K.Mishra,
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4. Shri Ramesh Narain Swamy,
Principal Secretary,
Urban Development,
NCT Government of Delhi,
Vikas Bhawan, I.P. Estate, New Delhi
5. Shri V.M. Bansal,
Secretary and Commissioner,
DDA, Vikas Sadan, INA, Delhi

6. Ms. Nisha Singh,
Deputy Secretary (DD),
Ministry of Urban Development,
Nirman Bhawan, New Delhi
7. Shri O.P. Mathur,
Director, NIPFP,
Special (Qutub) Institutional Area,
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8. Shri E.F.N. Rebeiro,
Director, AMDA, Siri Institutional Area,
Khel Gaon Marg, New Delhi
9. Shri N.C. Wadhwa,
Director,
Department of Town and Country Planning,
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10. Shri B.R. Mehta,
President, Council of Architecture,
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11. Shri A.B. Pawar,
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12. Mrs. Shiel Sethi,
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13. Shri U.K. Shrivastava,
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14. Shri B.C. Datta,
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15. Dr. N.B. Johri, (Convenor)
Joint Director, NCRPB

Study Group VIII: Economic and Fiscal Policy including resource mobilization, funding etc. Members

1. Dr. V.K. Tewari, (Chairman)
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3. Prof. S. Gangopadhyay,
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7. Shri U.K. Srivastava,
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Government of Rajasthan,
Nagar Niyojan Bhawan,
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8. Shri R.C. Aggarwal,
Chief Coordinator Planner (NCR)
Town and Country Planning Department,
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Sector -6, Panchkula, Haryana

9. Shri S.K. Zaman,
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10. Shri Chandu Bhutia,
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11. Shri V K Thakore (Convenor)
Joint Director, NCRPB
12. Shri P. Shisupalan, (Co-convenor)
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(Up to February 2001)
13. Ms. Anjali Pancholy, (Co-convenor)
Assistant Director, NCRPB

Co-opted Members

1. Shri B.K. Jain,
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2. Shri A.N. Gupta,
Director (Finance), HUDCO,
IHC, Lodhi Road, New Delhi

Sub-group 1: Economic activities and fiscal policy

Sub-group 2: Resource mobilisation and funding

3. MEMBERS OF NRSA TEAM (associated with the creation of database generation and preparation of maps)

1. Dr. V. Raghavswamy,
Group Director,
LU&US/RS&GIS-AA
Overall Coordinator
2. Pro.f. V. K. Jha,
Head, RRSSC, Dehradun

3. Dr. K. H. V. Durga Rao,
Scientist
4. Shri B. Ramesh,
Senior Scientist

5. Dr. S. K. Subrahmanyam,
Senior Scientist
6. Shri Tapas Ranjan Martha
Scientist

WORKING GROUP

A Working Group was constituted for further strategizing and phasing the Plan in respect of relevant areas. This Group also undertook a preliminary appraisal of draft Regional Plan-2021 in the context of recommendations of Review Plan-2001. This Group further examined the latest inputs received from the State Governments pursuant to the decision of 48th meeting of the Planning Committee.

The constitution of the Group is as under:

1. Shri Syed S. Shafi, (Chairman)
Former Chief Planner
TCPO and Former UN Expert on Urban Planning and Development
Flat No. 22, Hauz Khas SFS Apartments
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2. Shri R. C. Aggrawal
Former Chief Regional Planner and
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3. Shri Rajeev Malhotra
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4. Shri K. S. Chandrashekar
Joint Director, NCRPB
5. Shri S. Surendra (Secretary)
Deputy Director, NCRPB

PUBLICATION UNDER SECTION 12 OF THE NCRPB ACT, 1985

HINDUSTAN TIMES 27/12/04

NATIONAL CAPITAL REGION PLANNING BOARD
FORM A
(See Rule 23)

NOTICE UNDER SUB-SECTION 1 OF SECTION 12 OF THE NATIONAL CAPITAL REGION PLANNING BOARD ACT 1985 READ WITH RULE 23 OF THE NATIONAL CAPITAL REGION PLANNING BOARD RULES, 1985.

Notice is hereby given that:

(1) (a) The draft of the Regional Plan 2021 has been prepared, and
(b) A copy thereof will be available for inspection in the office of the **National Capital Region Planning Board situated at 1st Floor, Core-IVB, India Habitat Centre, Lodhi Road, New Delhi** and for convenience of the public, also in the offices of the NCR Planning and Monitoring Cells as under:

(i) Chief Coordinator Planner, C/o Chief Administrator, HUDA, SCO, Sector-6, Panchkula, Haryana.

(ii) Chief Town Planner (NCR) Town and Country Planning Department, Govt. of Rajasthan, Nagar Niyajan Bhawan, Jawaharalal Nehru Marg, Jaipur, Rajasthan.

(iii) Chief Coordinator Planner, NCR Cell, Town & Country Planning Deptt, Nagar Nigam Bhawan, Navyug Market, Commercial Building, 2nd Floor, Ghaziabad, U.P.

(iv) Associate Town & Country Planner, NCR Planning Cell, Govt. of NCT, Delhi, Room No. 507, 5th Level, B-Wing, Delhi Secretariat, I.P. Estate, New Delhi, on all working days from 11 a.m. to 3 p.m. till the date mentioned in Para 3 hereinafter.

(2) Objections and suggestions are hereby invited to the Draft Regional Plan.

(3) Objections and suggestions may be sent in writing to the **Member Secretary, National Capital Region Planning Board situated at 1st Floor, Core-IVB, India Habitat Centre, Lodhi Road, New Delhi** on or before 9th February, 2005.

Any person making the objection or suggestions should also give his name and address.

Member Secretary
National Capital Region Planning Board

Place: New Delhi. Date: 27.12.2004.
davp 1076(5)2004 (937989_1)

HINDU 30/1/05

NATIONAL CAPITAL REGION PLANNING BOARD, NEW DELHI

Prepared

Draft Regional Plan- 2021 of NCR

for
a balance and harmonised development of
National Capital Region (NCR)
and
Notified for inviting objections / suggestions
from public in leading
Newspapers on 27.12.2004

**Send your objections / suggestions
Latest by 9.2.2005**

To
Member Secretary, National Capital Region Planning Board
Core IV-B, First Floor, India Habitat Centre, Lodhi Road,
New Delhi-110003. Fax: 24642163

The Plan is displayed at NCR Planning Board, New Delhi and all the NCR Planning Cells at Delhi, Chandigarh (Haryana), Ghaziabad (UP) & Jaipur (Rajasthan). The Plan is also available on sale both in Hindi & English at a price of Rs. 225/-.

davp 2004/540

THE TIMES OF INDIA 8/2/05

**NATIONAL CAPITAL REGION PLANNING BOARD,
NEW DELHI**

Prepared

Draft Regional Plan- 2021 of NCR
&
Notified on 27.12.2004 and also advertised on
29/30.01.2005 in leading Newspapers for
inviting objections / suggestions from public.

**DATE
EXTENDED
UPTO
9.3.2005**

On the request of public and various
organizations, the date for receiving
objections / suggestions on draft Regional
Plan-2021 has been extended up to
9.3.2005.

Send your objections / suggestions to:
Member Secretary, National Capital Region Planning Board
Core IV-B, First Floor, India Habitat Centre, Lodhi Road,
New Delhi-110003. Fax: 24642163

The Plan is displayed at NCR Planning Board, New Delhi and all the NCR Planning Cells at Delhi, Chandigarh (Haryana), Ghaziabad (UP) & Jaipur (Rajasthan). The Plan is also available on sale both in Hindi & English at a price of Rs. 225/- in cash.

davp 2004/519

NOTIFICATION UNDER SECTION 13 OF THE NCRPB ACT, 1985 AND RULE 27 OF THE NCRPB RULES, 1985


Part III—Sec. 4] THE GAZETTE OF INDIA, SEPTEMBER 17, 2005 (BHADRA 26, 1927) 2363

NATIONAL CAPITAL REGION PLANNING BOARD
FORM B
(See Rule 27)
New Delhi, the 23rd August 2005

Notice under Sub-section 1 of Section 13 of the National Capital Region Planning Board Act, 1985 read with Rule 27 of the National Capital Region Planning Board Rules, 1985

Notice is hereby given that: -

(1) (a) The final Regional Plan has been prepared; and
(b) A copy thereof will be available for inspection in the office of the National Capital Region Planning Board situated at Core-IV B, 1st Floor, India Habitat Centre, Lodhi Road, New Delhi-110 003 on all working days from 11.00 A.M. to 3.00 P.M.


MEMBER SECRETARY
NATIONAL CAPITAL REGION PLANNING BOARD

**NATIONAL CAPITAL
REGION PLANNING BOARD**
Form B
(See Rule 27)

Notice under Sub-section 1 of Section 13 of the National Capital Region Planning Board Act, 1985 read with Rule 27 of the National Capital Region Planning Board Rules, 1985.

Notice is hereby given that:

(1) (a) The final Regional Plan has been prepared; and
(b) A copy thereof will be available for inspection in the office of the National Capital Region Planning Board situated at Core-IV B, 1st Floor, India Habitat Centre, Lodhi Road, New Delhi-110003 on all working days from 11.00 A.M. to 3.00 P.M.

MEMBER SECRETARY
NATIONAL CAPITAL REGION PLANNING BOARD

Place: New Delhi
Dated : 3rd October 2005

davp 1076(11)2005 (1070013_1)

AVAILABILITY OF URBANISABLE LAND IN NCT-DELHI FOR 2021

S. No.	Land Use	Area		Remarks
		(in Hectares)	(%age to total area)	
1	2	3	4	5
1.	Total geographical area of NCT-Delhi	1,48,300.00	100.00	
2.	Built-up area (as per IRS IC LISS III satellite data 1999)	70,162.00	47.31	
3.	Natural features to be conserved (forest, wild life sanctuary, ridge, river Yamuna and other water bodies/drains)	19,509.10	13.16	Forest-303.56 hectares, Wild life sanctuary- 28.54 hectares, Ridge-7777 hectares, river Yamuna-9700 hectares, Other water bodies/drains-170 hectares
4.	Sub-Total (Built-up + Natural features)	89,671.10	60.47	
5.	Balance land available in NCT-Delhi (1-4)	58,628.90	39.53	
6.	Land to be kept reserved for:			
(i)	Disposal of solid wastes generated up to 2051 [sanitary landfill, processing and statutory green belts) (refer Annexure 4/II)]	10,000.00	6.74	
(ii)	Metro services/utilities e.g. power plants, grid stations, water and sewerage treatment plants etc.	10,000.00	6.74	
(iii)	Agriculture zone in NCT-Delhi including dairy farming, horticulture, green belts etc.	11,000.00	7.42	
7.	Sub-total of S.No.6	31,000.00	20.90	
8.	Proposed/actual land available for urbanization (5-7)	27,628.90	18.63	
9.	Total urbanisable area 2021 (including built-up area 1999) (2+8)	97,790.90	65.94	
10.	Population, which can be accommodated in 97,790.90 hectares @ 225 PPH= 220 lakhs			

AVAILABILITY OF WATER IN NCT-DELHI

(Up to the year 2021 from existing known sources of water and the population it can sustain)

1.	Population (2021)	220 lakhs
2.	Rate of water supply	225 lpcd
3.	Water requirement for 220 lakhs population in the year 2021 including 15% losses (743 mld)	5693 mld say, 5700 mld
4.	Fresh Water available from various known sources	
	i) Surface Water-Yamuna and WJC	
	a) Chandrawal waterworks-river Yamuna at Wazirabad barrage	409 mld (90 mgd)
	b) Wazirabad waterworks-river Yamuna at Wazirabad barrage	545 mld (120 mgd)
	c) Haiderpur waterworks-Western Yamuna canal	908 mld (200 mgd)
	d) Nagloi waterworks-Western Yamuna canal	182 mld (40 mgd)*
	e) NCT-Delhi parallel branch (lining of canal)	91 mld (20 mgd)**
	Sub-total (i)	2,135 mld
	ii) Shahdara waterworks-water from Upper Ganga canal	454 mld (100 mgd)
	iii) Water expected from Tehri Dam	635 mld (140 mgd) [@]
	iv) Sub-surface water available	370 mld (81 mgd)
	v) Sub-surface water which can be available from Yamuna flood planes after protecting the same for ground water recharging in NCT-Delhi	200 mld (44 mgd)
	Total (i)-(v)	3,794 mld say, 3,800 mld
5.	Gap between demand and supply of drinking water	1,900 mld
6.	Gap to be bridged by use of recycled waste water (about 50% of S. No. 3 i.e., 3,800 mld) for non-potable purpose	1,900 mld

Note:

* 91 mld available at present

** Work in progress

@ Work in progress

LAND REQUIREMENT FOR SANITARY LAND FILLING IN DELHI UP TO THE YEAR 2051

S. No.	Particulars	2001-2021	2022-2035	2036-2051
1	2	3	4	5
a)	Generation of wastes			
i)	Per capita waste generation per day	685 gms	685 gms	685 gms
ii)	Projected Population	Year 2021: 220 lakhs	Year 2035: 260 lakhs*	Year 2051: 300 lakhs
iii)	Waste generation (beginning of block year)	6,000 MT/day	15,000 MT/day	18,000 MT/day
iv)	Waste generation (end of the block year)	15,000 MT/day	18,000 MT/day	20,550 MT/day
b)	Assuming life of sanitary landfill	20 years	15 years	15 years
c)	Total waste generated	=0.5(6000+15000)x365x20 = 76.65 x 10 ⁶ MT	=0.5(15000+18000)x365x15 = 90.34 x 10 ⁶ MT	=0.5(18000+20550)x365x15 = 105.53x 10 ⁶ MT
d)	Total waste volume (assumed density 0.85 MT/m ³)	=76.65 x 10 ⁶ /0.85 = 90.18 x 10 ⁶ m ³	=90.34 x 10 ⁶ /0.85 = 106.28 x 10 ⁶ m ³	=105.53 x 10 ⁶ /0.85 = 124.15 x 10 ⁶ m ³
e)	Volume of daily cover	=0.1 x 90.18 x 10 ⁶ = 9.02 x 10 ⁶ m ³	=0.1 x 106.28 x 10 ⁶ = 10.63 x 10 ⁶ m ³	=0.1 x 124.15 x 10 ⁶ = 12.42 x 10 ⁶ m ³
f)	Volume of liner and cover system	0.125 x 90.18 x 10 ⁶ = 11.27 x 10 ⁶ m ³	0.125 x 106.28 x 10 ⁶ = 13.29 x 10 ⁶ m ³	0.125 x 124.15 x 10 ⁶ = 15.52 x 10 ⁶ m ³
g)	First Estimate of volume requirement of waste, liner and cover systems (d)+(e)+(f)	(90.18+9.02+11.27) x 10 ⁶ = 110.47 x 10 ⁶ m ³	(106.28+10.63+13.29) x 10 ⁶ = 130.20 x 10 ⁶ m ³	(124.15+12.42+15.52) x 10 ⁶ = 152.09 x 10 ⁶ m ³
h)	Likely shape of landfill (Partly below and partly above ground)	Rectangular in plan Length: Width = 2:1	Rectangular in plan Length: Width = 2:1	Rectangular in plan Length: Width = 2:1
i)	Area restriction	Nil	Nil	Nil
j)	Possible maximum height	10 metres (half below ground and half above ground)	10 metres (half below ground and half above ground)	10 metres (half below ground and half above ground)
k)	Area required	=110.47 x 10 ⁶ /10 m ² = 11.05 sq kms	=130.20 x 10 ⁶ /10 m ² = 13.02 sq kms	=152.09 x 10 ⁶ /10 m ² = 15.21 sq kms
l)	Area will be	3.7 sq kms (Assuming 3 different locations)	3.26 sq kms (Assuming 4 different locations)	3.80 sq kms (Assuming 4 different locations)
	Approximate Dimension of each	2.7 km x 1.4 km (2700 m x 1400 m)	2.5 km x 1.3 km (2500 m x 1300 m)	2.7 km x 1.4 km (2700 m x 1400 m)
m)	Additional 30 metres land will be required around the landfill to place the equipments around landfill sites			
n)	As per Schedule III, para 10 of Notification No. 583 dated 27.09.1999 of MOE&F, a 500 metres wide buffer zone of no development be maintained around landfill site and shall be incorporated in the town planning departments land use plans.			
o)	Approximate dimension of each site incorporating para (m&n)	3760 m x 2460 m	3560 m x 2360 m	3760 m x 2460 m
p)	Total area required for sanitary landfill site for NCT-Delhi up to the year 2021 assuming 100% garbage will go to landfill site	3760 m x 2460 m x 3 = 3.76 km x 2.46 km x 3 = 27.75 sq kms	3560 m x 2360 m x 4 = 3.56 km x 2.36 km x 4 = 33.61 sq kms	3760 m x 2460 m x 4 = 3.76 km x 2.46 km x 4 = 37 sq kms

Note:

* As the projection was not available, it has been worked out on the basis of assumption for the mid value

1. Land requirement for disposal of solid wastes, which will be generated in NCT-Delhi up to the year 2051, through sanitary land filling is 100 sq kms assuming 100% disposal through landfill.
2. Assumptions for calculation of land requirement:
 - (i) Density of solid waste=0.85MT/m³.
 - (ii) Maximum height/depth of filling proposed is 10 metres on the basis of half below ground and half above ground and likely shape of landfill will be rectangular.
 - (iii) Three different locations have been proposed for sanitary landfill sites during the period 2001-2021, four locations for 2022-2035 and four locations for 2036-2051.
 - (iv) All solid waste will be disposed off through sanitary landfill.
3. Land area requirement will reduce if only 50% waste is disposed off through sanitary landfill and change in height/depth of filling. Land requirement will be 15.7 sq kms up to the year 2021 in case 50% waste is disposed off through sanitary landfill. In addition to this, if depth/height of filling is increased to 20 metres, the land requirement up to the year 2021 will be 7.35 sq kms.

ANNEXURE 4/III

POPULATION OF NCR CITIES/TOWNS, 1981-2001 AND PROJECTIONS FOR THE YEAR 2011 AND 2021

S. No.	Sub-region/City/Town	Class	Civic Status 2001	Population			Decadal Growth		Exponential Method		Water's Formula		Ratio Method	
				1981	1991	2001	1981-1991	1991-2001	2011	2021	2011	2021	2011	2021
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
I	Haryana													
1	<u>Panipat district</u>													
1	Panipat	I	UA	1,37,927	1,91,212	3,54,148	38.63	85.21	4,96,231	6,95,318	6,10,521	9,26,928	5,34,121	7,02,929
2	Samalkha	III	MC	13,532	18,384	29,866	35.86	62.46	40,149	53,973	47,932	70,229	45,043	59,279
3	<i>Asan Khurd</i>	V	CT	-	-	8,066	-	-	-	-	-	-	12,165	16,010
2	<u>Sonepat district</u>													
4	Sonepat	I	UA	1,09,369	1,43,922	2,25,074	31.59	56.39	2,99,243	3,97,852	3,52,763	5,10,353	3,39,453	4,46,737
5	Gohana	III	MC	26,188	32,496	48,532	24.09	49.35	63,703	83,616	73,764	1,04,904	73,195	96,328
6	Ganaur	IV	MC	16,489	20,952	29,006	27.07	38.44	37,324	48,028	41,679	57,319	43,746	57,572
7	Kharkhoda	V	MC	9,279	13,151	18,763	41.73	42.67	24,331	31,551	27,593	38,491	28,298	37,242
3	<u>Rohtak district</u>													
8	Rohtak	I	UA	1,66,767	2,16,096	2,94,577	29.58	36.32	3,77,593	4,84,003	4,18,064	5,70,467	4,44,277	5,84,689
9	Maham	IV	MC	11,722	15,083	18,174	28.67	20.49	22,634	28,188	23,038	29,040	27,410	36,073
10	Kalanaur	IV	MC	12,380	14,524	16,853	17.32	16.04	20,819	25,718	20,518	25,040	25,417	33,451
4	<u>Jhajjar district</u>													
11	Bahadurgarh	I	UA	37,488	57,235	1,26,746	52.68	121.45	1,89,712	2,83,960	2,36,119	3,71,103	1,91,156	2,51,571
12	Jhajjar	III	MC	24,247	27,693	39,002	14.21	40.84	50,406	65,146	56,796	78,757	58,822	77,413
13	Beri	IV	MC	13,490	14,508	16,162	7.55	11.40	19,798	24,251	18,765	21,976	24,375	32,079
14	<i>Ladrawan</i>	V	CT	-	-	8,008	-	-	-	-	-	-	12,078	15,895
15	<i>Sankhol</i>	V	CT	-	-	5,179	-	-	-	-	-	-	7,811	10,280
5	<u>Faridabad district</u>													
16	Faridabad	I	M. Corp	330,864	617,717	1,055,938	86.70	70.94	14,41,618	19,68,168	17,45,461	25,96,447	15,92,550	20,95,872
17	Palwal	I	MCI	47,328	59,168	100,722	25.02	70.23	1,37,333	1,87,250	1,66,106	2,46,800	1,51,907	1,99,917
18	Hodal	III	MC	18,740	25,635	38,309	36.79	49.44	50,293	66,025	58,251	82,863	57,777	76,037
19	Hathin	IV	MC	6,553	7,863	10,916	19.99	38.83	14,056	18,100	15,720	21,648	16,463	21,667
20	Hasanpur	V	MC	5,190	7,130	9,090	37.38	27.49	11,466	14,463	12,174	15,980	13,709	18,042
21	<i>Tilpat</i>	V	CT	-	-	6,369	-	-	-	-	-	-	9,606	12,641
6	<u>Gurgaon district</u>													
22	Gurgaon	I	UA	1,00,877	1,35,884	2,28,820	34.70	68.39	3,10,950	4,22,558	3,75,051	5,55,524	3,45,103	4,54,172
23	Sohna	III	MC	12,667	16,348	27,570	29.06	68.64	37,483	50,960	45,227	67,019	41,581	54,722

S. No.	Sub-region/City/Town	Class	Civic Status 2001	Population			Decadal Growth		Exponential Method		Water's Formula		Ratio Method	
				1981	1991	2001	1981-1991	1991-2001	2011	2021	2011	2021	2011	2021
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
24	Firozpur Jhirka	IV	MC	9,400	12,413	17,755	32.05	43.04	23,039	29,895	26,160	36,534	26,778	35,241
25	Taoru	IV	MC	6,912	12,534	17,328	81.34	38.25	22,289	28,672	24,871	34,181	26,134	34,393
26	Hailley Mandi	IV	MC	10,140	13,263	17,081	30.80	28.79	21,596	27,305	23,088	30,503	25,761	33,903
27	Pataudi	IV	MC	8,422	11,278	16,085	33.91	42.62	20,856	27,042	23,649	32,983	24,259	31,926
28	Punhana	IV	MC	4,325	8,697	13,179	101.09	51.54	17,368	22,888	20,231	28,935	19,876	26,158
29	Nuh	IV	MC	5,992	7,492	11,039	25.03	47.34	14,437	18,881	16,620	23,508	16,649	21,911
30	Dundahera	IV	CT	4,604	6,767	10,626	46.98	57.03	14,144	18,827	16,698	24,192	16,026	21,091
31	Farukknagar	V	MC	6,367	8,046	9,521	26.37	18.33	11,811	14,651	11,842	14,706	14,359	18,898
7	<u>Rewari district</u>													
32	Rewari	I	MCI	51,562	75,342	1,00,684	46.12	33.64	1,28,429	1,63,820	1,40,559	1,89,771	1,51,850	1,99,842
33	Dharuhera	IV	MCI	5,266	10,848	18,892	106.00	74.15	25,944	35,627	31,549	47,170	28,493	37,498
34	Bawal	IV	CT	7,760	9,010	12,144	16.11	34.78	15,523	19,842	17,075	23,161	18,315	24,104
35	Rewari (Rural)	VI	CT	-	-	4,454	-	-	-	-	-	-	6,717	8,840
II Rajasthan														
1	<u>Alwar district</u>													
36	Alwar	I	UA	1,45,795	2,10,146	2,66,203	44.14	26.68	3,35,282	4,22,288	3,35,959	4,36,259	3,49,426	4,43,422
37	Bhiwadi	III	CT	1,729	15,285	33,877	784.04	121.64	50,724	75,949	57,013	90,278	44,468	56,430
38	Khairthal	III	M	15,962	22,741	32,005	42.47	40.74	41,356	53,439	43,533	60,108	42,011	53,312
39	Rajgarh	III	M	-	20,223	25,009	-	23.67	31,327	39,240	30,965	39,528	32,828	41,658
40	Behror	III	M	1,085	16,238	22,856	1,396.59	40.76	29,535	38,166	31,091	42,933	30,001	38,072
41	Tijara	IV	M	12,199	15,399	19,921	26.23	29.37	25,214	31,913	25,548	33,639	26,149	33,183
42	Kherli	IV	M	-	12,263	15,506	-	26.45	19,522	24,577	19,542	25,344	20,354	25,829
43	Govindgarh	IV	CT	-	7,991	10,089	-	26.25	12,697	15,980	12,700	16,454	13,243	16,806
44	<i>Kishangarh</i>	V	CT	-	-	9,473	-	-	-	-	-	-	12,435	15,779
III Uttar Pradesh														
1	<u>Meerut district</u>													
45	Meerut	I	UA	5,36,615	8,49,799	11,61,716	58.36	36.70	14,90,153	19,11,444	15,17,842	20,87,016	14,53,500	18,23,742
46	Mawana	II	MB	37,620	51,701	69,191	37.43	33.83	88,289	1,12,658	89,160	1,21,075	86,569	1,08,621
47	Sardhana	III	MB	30,138	42,980	48,314	42.61	12.41	59,291	72,762	54,404	64,137	60,449	75,847
48	Kithaur	III	NP	13,791	19,270	23,614	39.73	22.54	29,519	36,900	28,574	36,500	29,545	37,071
49	Hastinapur	III	NP	11,637	15,081	21,249	29.60	40.90	27,465	35,501	28,291	39,546	26,586	33,358
50	Sewal Khas	IV	NP	10,278	14,402	18,451	40.12	28.11	23,300	29,423	23,074	30,462	23,085	28,966
51	Lawar	IV	NP	11,535	14,471	18,035	25.45	24.63	22,631	28,397	22,104	28,608	22,565	28,313
52	Parikshitgarh	IV	NP	11,328	13,677	17,369	20.74	26.99	21,889	27,585	21,584	28,321	21,732	27,267
53	Phalauda	IV	NP	10,357	13,970	17,206	34.88	23.16	21,533	26,948	20,901	26,806	21,528	27,011
54	Karnawal	IV	NP	9,895	11,047	12,609	11.64	14.14	15,523	19,109	14,392	17,243	15,776	19,794
55	Kharkhoda	IV	NP	8,708	10,550	12,593	21.15	19.36	15,651	19,452	14,926	18,654	15,756	19,769

S. No.	Sub-region/City/Town	Class	Civic Status 2001	Population			Decadal Growth		Exponential Method		Water's Formula		Ratio Method	
				1981	1991	2001	1981-1991	1991-2001	2011	2021	2011	2021	2011	2021
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
56	Daurala	IV	NP	9,146	10,025	10,685	9.61	6.58	12,974	15,754	11,439	12,643	13,369	16,774
57	Behsuma	IV	NP	7,906	9,060	10,561	14.60	16.57	13,059	16,148	12,275	15,014	13,214	16,579
58	<i>Aminagar urf Bhurbaral</i>	V	CT	-	-	5,500	-	-	-	-	-	-	6,881	8,634
59	<i>Mohiuddinpur</i>	V	CT	-	-	4,890	-	-	-	-	-	-	6,118	7,677
2	<u>Baghpat district</u>													
60	Baraut	II	MB	46,292	67,705	85,708	46.26	26.59	1,07,932	1,35,920	1,06,263	1,39,114	1,07,235	1,34,550
61	Khekada	III	NP	24,984	35,191	40,335	40.85	14.62	49,698	61,235	46,208	55,595	50,466	63,321
62	Baghpat	III	MB	17,157	24,939	36,384	45.36	45.89	47,458	61,902	49,451	70,336	45,522	57,118
63	Chhaprauli	IV	NP	13,805	16,008	17,798	15.96	11.18	21,793	26,684	19,842	23,108	22,268	27,941
64	Tikri	IV	NP	11,315	12,784	13,427	12.98	5.03	16,258	19,685	14,161	15,334	16,799	21,079
65	Doghat	IV	NP	10,019	12,310	13,263	22.87	7.74	16,139	19,637	14,351	16,090	16,594	20,821
66	Aggarwal Mandi	IV	NP	9,353	10,871	12,405	16.23	14.11	15,271	18,798	14,156	16,956	15,521	19,474
67	Aminagar Sarai	IV	NP	6,837	8,274	10,112	21.02	22.21	12,633	15,782	12,211	15,564	12,652	15,875
3	<u>Ghaziabad district</u>													
68	Ghaziabad	I	M Corp	2,87,170	5,11,759	9,68,256	78.21	89.20	13,66,611	19,28,856	14,89,453	23,22,451	12,11,449	15,20,035
69	Hapur	I	MB	1,02,837	1,46,262	2,11,983	42.23	44.93	2,76,020	3,59,402	2,87,019	4,06,944	2,65,226	3,32,786
70	Loni	I	NP	10,259	36,561	1,20,945	256.38	230.80	2,20,926	4,03,558	2,17,289	3,71,270	1,51,322	1,89,868
71	Modinagar	I	UA	87,665	1,23,279	1,39,929	40.63	13.51	1,72,063	2,11,578	1,58,939	1,89,321	1,75,074	2,19,670
72	Behta Hajipur	II	CT	4,058	30,360	94,298	648.15	210.60	1,66,028	2,92,320	1,67,298	2,83,970	1,17,982	1,48,036
73	Muradnagar	II	MB	26,047	44,395	74,151	70.44	67.03	1,00,515	1,36,253	1,08,124	1,62,422	92,775	1,16,407
74	Pilkhuwa	II	MB	37,884	50,162	66,907	32.41	33.38	85,305	1,08,762	86,025	1,16,581	83,712	1,05,035
75	<i>Dharoti Khurd</i>	III	CT	-	-	34,044			-	-	-	-	42,595	53,445
76	Garhmukteshwar	III	MB	17,914	25,241	33,847	40.90	34.10	43,210	55,164	43,673	59,377	42,348	53,135
77	Dasna	III	NP	13,037	16,963	24,434	30.11	44.04	31,764	41,292	32,964	46,597	30,571	38,358
78	Faridnagar	IV	NP	9,116	10,940	11,272	20.01	3.03	13,599	16,406	11,651	12,257	14,103	17,696
79	Ordi. Fact. Muradnagar	IV	CT	9,026	12,792	10,756	41.72	-15.92	12,536	14,611	8,431	4,716	13,458	16,886
80	Niwari	V	NP	7,078	8,841	9,921	24.91	12.22	12,171	14,931	11,154	13,125	12,413	15,575
81	Patala	V	NP	7,847	9,181	9,733	17.00	6.01	11,806	14,320	10,363	11,371	12,178	15,280
82	Babugarh	V	NP	2,389	3,581	5,939	49.90	65.85	8,033	10,866	8,631	12,934	7,431	9,323
4	<u>Gautam Buddha Nagar district</u>													
83	NOIDA	I	CT	37,000	1,46,514	3,05,058	295.98	108.21	4,45,731	6,51,274	4,86,073	7,75,378	3,81,678	4,78,901
84	Dadri	II	MB	19,723	32,883	57,416	66.72	74.61	78,912	108,456	85,426	130,193	71,837	90,136
85	Jewar	III	NP	15,275	21,376	27,016	39.94	26.38	34,009	42,811	33,455	43,747	33,802	42,412
86	Rabupura	IV	NP	8,999	10,769	13,046	19.67	21.14	16,267	20,283	15,646	19,801	16,323	20,481
87	Dankaur	IV	CT	7,935	9,531	11,999	20.11	25.89	15,091	18,980	14,817	19,320	15,013	18,837
88	<i>Salarpur Khadar</i>	IV	CT	-	-	10,750	-	-	-	-	-	-	13,450	16,876
89	Jahangirpur	V	NP	6,447	8,206	9,510	27.28	15.89	11,745	14,505	10,999	13,378	11,899	14,929

S. No.	Sub-region/City/Town	Class	Civic Status 2001	Population			Decadal Growth		Exponential Method		Water's Formula		Ratio Method	
				1981	1991	2001	1981-1991	1991-2001	2011	2021	2011	2021	2011	2021
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
90	Bilaspur	V	NP	4,661	6,127	7,481	31.45	22.10	9,344	11,671	9,027	11,498	9,360	11,744
91	Kakod	V	NP	4,299	5,838	7,139	35.80	22.29	8,920	11,145	8,624	10,998	8,932	11,207
5	<u>Bulandshahr district</u>													
92	Bulandshahr	I	MB	1,03,436	1,27,201	1,76,425	22.98	38.70	2,27,126	2,92,398	2,32,626	3,22,448	2,20,737	2,76,964
93	Khurja	II	MB	67,119	80,305	98,610	19.65	22.79	1,23,324	1,54,233	1,19,509	1,52,912	1,23,377	1,54,805
94	Sikandarabad	II	MB	43,135	60,992	69,867	41.40	14.55	86,076	106,044	80,000	96,195	87,415	1,09,682
95	Jahangirabad	II	MB	29,301	37,981	51,394	29.62	35.32	65,757	84,135	66,708	91,184	64,302	80,682
96	Guloathi	III	MB	24,416	33,982	42,903	39.18	26.25	53,995	67,954	53,088	69,367	53,679	67,352
97	Siana	III	MB	22,410	29,888	38,999	33.37	30.48	49,461	62,730	49,401	66,027	48,794	61,223
98	Debai	III	MB	22,430	27,721	34,877	23.59	25.81	43,859	55,153	43,047	56,105	43,637	54,752
99	Shikarpur	III	MB	21,499	29,197	33,187	35.81	13.67	40,820	50,209	37,743	45,023	41,522	52,099
100	Anupshahr	III	MB	15,193	19,684	23,795	29.56	20.88	29,655	36,959	28,489	35,990	29,771	37,355
101	Naraura	III	NP	9,573	15,652	20,407	63.50	30.38	25,877	32,812	25,836	34,513	25,533	32,036
102	Aurangabad	III	NP	11,622	15,402	20,097	32.52	30.48	25,488	32,326	25,457	34,025	25,145	31,550
103	Pahasu	IV	NP	9,016	13,127	17,122	45.60	30.43	21,713	27,536	21,683	28,973	21,422	26,879
104	Khanpur	IV	NP	8,311	11,420	13,761	37.41	20.50	17,138	21,344	16,434	20,706	17,217	21,603
105	Bugrasi	IV	NP	8,307	11,093	12,789	33.54	15.29	15,777	19,463	14,725	17,820	16,001	20,077
106	Chhatari	IV	NP	5,862	8,202	10,903	39.92	32.93	13,890	17,694	13,987	18,915	13,641	17,116
107	Bhawan Bahadur Nagar	V	NP	6,779	9,101	9,322	34.25	2.43	11,234	13,538	9,574	9,978	11,663	14,634

Source: Census 2001- Final Population Totals, Census of India

Note:

1) Projections have been made for 97 towns in NCR

2) Town names in italics indicate that the town has been added for the first time in Census 2001. Projections have not been made for these.

3) The projections have been made as per methodology suggested by the Study Group on Policy zones, demographic profile and settlement pattern.

4) This does not include NCT-Delhi

Size Class of Towns

Class-I 1,00,000 +

Class-II 50,000 to 99,999

Class-III 20,000 to 49,999

Class-IV 10,000 to 19,999

Class-V 5,000 to 9,999

Civic Status

UA Urban Agglomeration

M Corp Municipal Corporation

M Cl Municipal Council

MC Municipal Committee

MB Municipal Board

NP Nagar Panchayat

CB Cantonment Board

CT Census Town

A) CLASSIFIED TRAFFIC VOLUME COUNT AT SELECTED POINTS (1999)

Description	Non-Motorized Vehicles	Motor Cycles	Auto Rickshaw	Passenger Car	Bus	Trucks	Sub-Total	Motorized Vehicles
1	2	3	4	5	6	7	(5-7)=8	(3-7)=9
Boundary of Delhi NH2	5,636	10,504	392	20,077	1,408	8,211	29,696	40,592
Boundary of Delhi NH8	1,733	8,901	175	24,650	2,533	9,441	36,624	45,700
Boundary of Delhi NH10	2,965	4,541	746	6,667	863	5,084	12,614	17,901
Boundary of Delhi NH1	1,938	3,863	312	12,714	2,305	11,338	26,357	30,532
Boundary of Delhi SH57	2,277	1,752	112	1,833	526	3,857	6,216	8,080
Bridge over Hindon NH24	8,085	15,122	8,317	22,578	7,924	15,514	46,016	69,455
Bridge over Hindon NH24 bypass	6,670	5,003	1,732	5,807	1,221	2,803	9,831	16,566
Ghaziabad-Modinagar (NH58)	2,711	4,966	457	8,225	1,920	5,591	15,736	21,159
Modinagar-Meerut (NH58)	2,135	3,073	578	6,560	2,150	5,057	13,767	17,418
Meerut-Baghpat	866	514	14	492	193	1,029	1,714	2,242
Yamuna river-Wazirabad bridge	14,657	14,014	2,941	8,274	4,619	9,332	22,225	39,180
Yamuna river-ISBT bridge	14,989	19,673	13,460	21,342	6,853	13,957	42,152	75,249
Yamuna river-Yamuna bridge	30,465	19,054	12,275	8,290	335	1,279	9,904	41,233
Yamuna river-ITO bridge	16,097	58,837	16,795	48,361	9,340	2,831	60,532	1,37,164
Yamuna river-Nizamuddin bridge	7,477	34,889	6,411	53,011	4,397	7,675	65,083	1,06,383
Yamuna river-Okhla bridge	4,059	7,448	1,419	11,402	845	5,909	18,156	27,023

B) DIRECTIONAL PROPORTIONS FLOW AT MORNING AND EVENING PEAK HOUR

Location	Time	Peak	%Flow to NCT-D	%Flow from NCT-D
1	2	3	4	5
Ghaziabad-Modinagar (NH58)	Morning Peak	1030-1130	55.4	44.6
	Evening Peak	1730-1830	46.7	53.4
Modinagar-Meerut (NH58)	Morning Peak	1000-1100	50.3	49.7
	Evening Peak	1215-1315	38.0	62.0
Yamuna river-Wazirabad bridge	Morning Peak	0830-0930	74.2	25.8
	Evening Peak	1730-1830	46.8	53.1
Yamuna river-ISBT bridge	Morning Peak	1045-1145	60.3	39.6
	Evening Peak	1530-1630	133.0	67.0
Yamuna river- Yamuna bridge	Morning Peak	1000-1100	57.8	42.2
	Evening Peak	1615-1715	55.9	43.9
Yamuna river-ITO bridge	Morning Peak	0915-1015	66.4	33.6
	Evening Peak	1845-1945	24.7	75.3
Yamuna river-Nizamuddin bridge	Morning Peak	0830-0930	79.3	20.7
	Evening Peak	1745-1845	42.4	57.6
Yamuna river-Okhla bridge	Morning Peak	1030-1130	47.4	52.6
	Evening Peak	1700-1800	43.7	56.3

Source: The Feasibility Study on the construction of Expressways in the National Capital Region in India, JICA Study Team, Pacific Consultants International, March 2000.

A) BREAK-UP OF TRIPS ON THE BASIS OF THE ORIGIN-DESTINATION

	Internal to External (Delhi to NCR)	External to Internal (NCR to Delhi)	External to External (Outside Delhi)	Total
1	2	3	4	5
Number of Trips (in lakhs)	12.54	14.32	7.34	34.21
Percentage of Total (%)	36.67	41.86	21.27	100.00

Source: The Feasibility Study on the construction of Expressways in the National Capital Region in India, JICA Study Team, Pacific Consultants International, March 2000.

B) BREAK-UP OF TRIPS ON THE BASIS OF THE MODE USED

	Public Mode	Private Mode	Total
1	2	3	4
Number of Trips (in lakhs)	24.47	9.73	31.54
Percentage of Total (%)	71.54	28.46	100.00

Source: Identification of Rail Projects for Commuter Traffic for Delhi and NCR, March 1999, RITES.

A) TRANSPORT DEMAND FORECAST FOR DESIGN YEARS IN URBAN AREAS OF NCT-DELHI

S. No.	Item	2005	2011	2025
1	2	3	4	5
1.	Intra city trips (lakhs)	160.4	215.4	260.6
2.	Modal split-Public transport (%)	82.00	82.00	82.00
3.	Mass transport trips (lakhs)	131.5	176.6	213.7
	MRTS (lakhs)	43.2	58.0	71.0
	NR (lakhs)	14.2	19.0	23.0
	Bus (lakhs)	74.1	99.6	119.7
4.	Peak hour factor (%)	10.00	10.00	10.00
5.	Peak direction factor (%)	60.00	60.00	60.00

Source: Identification of Rail Projects for Commuter Traffic for Delhi and NCR, RITES, March 1999.

B) PROJECTED TRAVEL DEMAND FOR INTERCITY TRIPS IN NCT-DELHI AND NCR

Mode	Daily Transport Demand (in lakhs)		
	2005	2011	2025
1	2	3	4
Rail	13.11	16.72	34.03
Bus	13.77	17.56	35.73
Other modes	5.90	7.52	15.32
Total	32.78	41.80	85.08

Source: Identification of Rail Projects for Commuter Traffic for Delhi and NCR, RITES, March 1999.

A) PROPOSED RAIL NETWORK DEVELOPMENT PLAN IN NCT-DELHI

S. No.	Section	Proposals	
		Phase I (2011)	Phase II (2021)
1	2	3	4
1	Shahdara-Sahibabad	Dedicated BG double line and electrified (on MRTS standards)	-
2	Sahibabad-New Delhi railway station	Dedicated BG double line and electrified	-
3	Holambi Kalan-Narela	Dedicated BG double line and electrified (on MRTS standards)	-
4	Dayabasti-Bijwasan	Dedicated, electrified BG double line	-
5	Tilak Bridge-Tughlakabad	Dedicated BG double line electrified	-
6	Southern ring rail from Tilak bridge to Daya Basti	Strengthening, one more line	One more line (dedicated)
7	Patel Nagar to Shakurbasti	Dedicated BG double line electrified	-
8	Brar Square to Delhi Cantonment station	Dedicated, electrified BG double line	-
9	Terminal at Tilak bridge	EMU terminal	-
10	New Tilak bridge to Mayur Vihar (NCT-Delhi border)-part of New Tilak bridge Noida-Greater Noida new rail link	Dedicated, electrified BG double line	

B) PROPOSED RAIL NETWORK DEVELOPMENT PLAN IN NCR

S. No.	Section	Proposals	
		Phase I (2011)	Phase II (2021)
1	2	3	4
1	Narela-Sonepat	Strengthening, dedicated BG double line electrified	-
2	Sonepat-Panipat	Strengthening, automatic colour light signaling, one more BG line electrified	One more electrified BG line (dedicated)
3	Nangaloi-Bahadurgarh	Strengthening, automatic colour light signalling and electrification, dedicated BG double line electrified	-
4	Bahadurgarh-Rohtak	Strengthening, automatic colour light signalling and electrification, one more BG line	One more BG line (dedicated)
5	Bijwasan-Gurgaon	Dedicated, electrified BG double line	-
6	Gurgaon-Rewari	Strengthening and electrification, one more BG line	One more BG line (dedicated)
7	Sahibabad-Ghaziabad	Dedicated BG double line electrified	-
8	Ghaziabad-Meerut	Strengthening and electrification, one more BG line	One more BG line (dedicated)
9	Ghaziabad-Hapur	Strengthening and electrification	One more line
10	Ghaziabad-Khurja	Strengthening	One more line
11	Tilak Bridge-Noida	Dedicated BG double line electrified	-
12	NOIDA-Dadri	-	Dedicated BG double line electrified
13	Tughlakabad-Ballabhgarh	Dedicated BG double line electrified (new rail line)	-
14	Ballabhgarh-Palwal	Strengthening, one more BG line	One more BG line (dedicated)
15	Shahdara-Shamli	Strengthening	One more line

Source: Identification of Rail Projects for Commuter Traffic for Delhi and NCR, March 1999, RITES

PLAN OF ACTION AND PHASING–POWER

S. No.	Policies/Proposals	10 th Plan (2002-2007)	11 th Plan (2007-2012)	12 th Plan (2012-2017)	13 th Plan (2017-2021)
1	2	3	4	5	6
1.	<p><u>Future Demand and Augmentation of Power:</u> Additional power generating capacity augmentation in the installed capacity of power plants required by the year 2021 is 23,345 MW for which following recommendations have been made:-</p> <ul style="list-style-type: none"> § Allocation of power from the new central sector/mega projects to be made by the Ministry of Power. § Ministry of Power to consider allocation of power from the 15% unallocated quota from the Central sector projects available with the government. § State Governments to allocate power to their Sub-region from their new State sector projects § State Governments should ensure the allocated quota to their respective Sub-regions from the present allocation/ generation of power. § State Governments should enter MOU with power generation companies to ensure requisite allocation of power to the Sub-region simultaneously and expeditiously. § Efficient and clean technology based power plants should be encouraged/adopted to meet the growing power demand in order to reduce Greenhouse gases (GHG) levels. 	Net generation needs to be augmented by about 4,500 MW by the year 2006-2007.	Net generation needs to be augmented by about 2,600 MW by the year 2011-2012.	Net generation needs to be augmented by about 8,000 MW by the year 2016-2017.	Net generation needs to be augmented by about 8,500 MW by the year 2020-2021.
2.	<p><u>Load Management:</u> Modern techniques for Load Management must be adopted to flatten the load curve and reduce the peak demand in the system to manageable proportion, vis-à-vis availability of generation in the grid through a control room by starting ripple generators, so that breakdown of generation is minimized. This will generate savings in the investment on additional generation of power for peak demand. Similarly, street lighting on National Highways/ State Highways within the NCR can have centrally controlled system for operation through operation of ripple generator. Energy efficient housing should be promoted and the concept of 66 KV underground cable ring main system should be planned</p>	<p>Directions to be issued to the participating States in the first year of the implementation to adopt the policies.</p> <p>CEA and State Government to undertake islanding of NCR after revisiting the system.</p> <p>Follow up and monitoring of implementation of policies to be done.</p>	Follow up and monitoring of implementation of policies to be done.	Follow up and monitoring of implementation of policies to be done.	Follow up and monitoring of implementation of policies to be done.

S. No.	Policies/Proposals	10 th Plan (2002-2007)	11 th Plan (2007-2012)	12 th Plan (2012-2017)	13 th Plan (2017-2021)
1	2	3	4	5	6
	<p>and executed in new townships to provide uninterrupted power supply.</p> <p>It is also proposed that an Islanding Scheme for NCR as second level of Island after NDMC/Delhi will be prepared by CEA and concerned State power utilities after revisiting the scheme which will be implemented by the concerned power utility companies for better load management.</p>				
3.	<p><u>Improvement in Transmission and Distribution:</u> Transmission and distribution system in the region should be improved by properly designing the L.T. distribution system viz. service line & service mains and by providing transformers with adequate capacities, electronic meters, LT/HT breakers conforming to IE Rules and specifications and by promoting communications (automation) in power supply system.</p> <p>State Governments will also carry out periodic audit for identification of technical and commercial losses which will help in improving the transmission and distribution system on a regular basis.</p>	<p>Improvement in the T&D has already been initiated by the State governments of UP and Haryana. At least, 60% of the area of the region should be covered by the end of 10th Plan.</p> <p>State Governments will carry out periodic auditing on regular interval.</p>	<p>Remaining 40% of the area of NCR should be covered during the 11th Plan period. Capacity augmentation to be done for additional power generation.</p> <p>State Governments will carry out periodic auditing on regular interval.</p>	<p>Capacity augmentation to be done for additional power generation.</p> <p>State Governments will carry out periodic auditing on regular interval.</p>	<p>Capacity augmentation to be done for additional power generation.</p> <p>State Governments will carry out periodic auditing on regular interval.</p>
4.	<p><u>Sub-group within Northern Region Electricity Board:</u> Sub-group within Northern Region Electricity Board should be created for NCR by Ministry of Power to oversee the power supply and periodically discuss the power issues in NCR and make recommendations regarding quality and reliability of power supply in the region.</p>	<p>Sub-group within NCRPB to be created by the Ministry of Power to oversee the implementation of the policies immediately and review of quality and reliability of power supply on regular basis.</p>	<p>Ministry of Power to implement the policies immediately and review of quality and reliability of power supply on regular basis.</p>	<p>Ministry of Power to implement the policies immediately and review of quality and reliability of power supply on regular basis.</p>	<p>Ministry of Power to implement the policies immediately and review of quality and reliability of power supply on regular basis.</p>
5.	<p><u>Sectoral Plans for Power:</u> State Governments concerned will prepare Sectoral Plans for power and incorporate/integrate the same in their respective Sub-regional Plans in order to improve the quality of power supply in their respective Sub-regions.</p>	<p>State Governments concerned will prepare Sectoral Plans for power and incorporate/integrate the same in their respective Sub-regional Plans.</p>	<p>State Governments concerned to review on regular basis.</p>	<p>State Governments concerned to review on regular basis.</p>	<p>State Governments concerned to review on regular basis.</p>

S. No.	Policies/Proposals	10 th Plan (2002-2007)	11 th Plan (2007-2012)	12 th Plan (2012-2017)	13 th Plan (2017-2021)
1	2	3	4	5	6
6.	<u>Promotion for Non-conventional Energy Resources:</u> Emphasis should be given for promoting non-conventional energy resources such as solar energy plants on roof top etc. in big hotels, institutions, commercial buildings, group housing etc. to meet part of power demand.	To be implemented by the respective State Governments through enactment of an Act in this regard in the first year of implementation of the Plan. Mass awareness to be created among public.	Mass awareness to be created among public.	Mass awareness to be created among public.	Mass awareness to be created among public.
7.	<u>Public-Private Partnership:</u> In view of the huge investment of about Rs.93,380 crores, for the generation of power and Rs.58,000 crores for transmission & distribution, in the year 2021, public/private partnership should be promoted. Commercial approach and simplified procedures for the release of new connections, upgradation of demand load etc. should be adopted by these companies. In order to promote public/private partnership/ Joint Venture companies, the enabling provision in the Power Act may have to be made.	To be implemented by the respective State Governments in this regard in the first year of implementation of the Plan.	To be reviewed and improvement to be made as and when required.	To be reviewed and improvement to be made as and when required.	To be reviewed and improvement to be made as and when required.
8.	<u>Review of Policies and Strategies for Power:</u> In view of the reforms at the national level and technological advancements taking place, the review the Power Sector strategies and policies for NCR should be done at least once in every five years.		Review to be done in the year 2007-2008.	Review to be done in the year 2012-2013.	Review to be done in the year 2020-2021.
9.	<u>Investment Plan:</u> Power requirement in the region would be 23,345 MW by the year 2021 and accordingly there will be need to generate this additional power and strengthen/ expand the transmission and distribution lines in the region. Total investment required for the generation of power by the year 2021 will be Rs.93,380 crores and for strengthening/expansion of transmission and distribution system, it will be Rs.58,362 crores.	Investment requirement for augmenting power generation in the region is Rs.18,052 crores. Constituent State Governments will have to interact with Ministry of Power to get power allocated from Central sector project/mega projects, unallocated quota of Central Government, sign power purchase agreement with power generating companies	Investment requirement for augmenting power generation in the region is Rs.10,196 crores. Constituent State Governments will have to interact with Ministry of Power to get power allocated from Central sector project/mega projects, unallocated quota of Central Government, sign power purchase agreement with States with surplus power or enhance their capacity of power	Investment requirement for augmenting power generation in the region is Rs.31,120 crores. Constituent State Governments will have to interact with Ministry of Power to get power allocated from Central sector project/mega projects, unallocated quota of Central Government, sign power purchase agreement with power generating companies	Investment requirement for augmenting power generation in the region is Rs.34,012 crores. Constituent State Governments will have to interact with Ministry of Power to get power allocated from Central sector project/mega projects, unallocated quota of Central Government, sign power purchase agreement with power generating companies

S. No.	Policies/Proposals	10 th Plan (2002-2007)	11 th Plan (2007-2012)	12 th Plan (2012-2017)	13 th Plan (2017-2021)
1	2	3	4	5	6
		<p>or States with surplus power or enhance their capacity of power generation.</p> <p>Investment of about Rs.11,282 crores will have to be made by States or transmission/distribution companies for improvement and upgradation of transmission and distribution system in the region.</p>	<p>generation.</p> <p>Investment of about Rs.6,372.50 crores will have to be made by States or transmission/distribution companies for improvement and upgradation of transmission and distribution system in the region.</p>	<p>or States with surplus power or enhance their capacity of power generation.</p> <p>Investment of about Rs.19,450 crores will have to be made by States or transmission/distribution companies for improvement and upgradation of transmission and distribution system in the region.</p>	<p>or States with surplus power or enhance their capacity of power generation.</p> <p>Investment of about Rs.21,257 crores will have to be made by States or transmission/distribution companies for improvement and upgradation of transmission and distribution system in the region.</p>

STATUS OF WATER SUPPLY IN NCR TOWNS

S. No.	Sub-region/Town	Source	Installed Capacity (in mld)	Present Production (in mld)	Present rate of W/S (in lpcd)	Number of Water Treatment Plants	Type of Treatment
1	2	3	4	5	6	7	8
Haryana							
1	Faridabad	T/W	115.33	115.33	100	NIL	Chlorination
2	Gurgaon	T/W/Canal	17.52	17.52	95	NIL	RF, Chlorination
3	Bahadurgarh	Canal	6.90	6.90	80	03	SSF, Chlorination
4	Panipat	T/W	38.40	38.40	145	NIL	Chlorination
5	Rewari	Canal	12.10	12.10	110	02	RSF, Chlorination
6	Palwal	T/W	5.91	5.91	80	NIL	Chlorination
7	Rohtak	Canal	22.39	22.39	80	13	SSF & RSF, Chlorination
8	Sonepat	Canal/T/W	14.63	14.63	80	1	RF, Chlorination
9	Samalkha	T/W	1.74	1.74	70	NIL	Chlorination
10	Gohana	T/W	2.82	2.82	70	NIL	Chlorination
11	Gannaur	T/W	1.20	1.20	45	NIL	Chlorination
12	Jhajjar	Canal	3.35	3.35	110	07	SSF, Chlorination
13	Haily Mandi	T/W	0.86	0.86	50	NIL	Chlorination
14	Pataudi	T/W	1.06	1.06	70	NIL	Chlorination
15	Sohna	T/W	1.48	1.48	70	NIL	Chlorination
16	Hodel	T/W	3.86	3.86	110	NIL	Chlorination
17	Nuh	T/W	0.68	0.68	80	NIL	Chlorination
18	Meham	Canal	1.35	1.35	70	05	SSF, Chlorination
19	Bawal	T/W	1.04	1.04	100	NIL	Chlorination
20	Village Kosli	Canal	0.98	0.98	110	03	SSF, Chlorination
21	Village Kundli	T/W	0.94	0.94	110	NIL	Chlorination
22	Village Dharuhera	T/W	1.10	1.10	50	NIL	Chlorination
Rajasthan							
1	Alwar	T/W-114 Nos. O/W-31 Nos. H.P's-327 Nos.	32.50	29.50	98	NIL	Chlorination
2	Bhiwadi	N.A.	N.A.	2.40			
3	Khaithal	TW -8 Nos. O/W-2 Nos. HP-61 Nos.	1.50	1.30	65	NIL	Chlorination
4	Behror	TW-10 Nos. O/W-2 Nos. HPP-48 Nos.	1.10	1.40	75	NIL	Chlorination

S. No.	Sub-region/Town	Source	Installed Capacity (in mld)	Present Production (in mld)	Present rate of W/S (in lpcd)	Number of Water Treatment Plants	Type of Treatment
1	2	3	4	5	6	7	8
5	Tijara	TW-9 Nos. HP-41 Nos.	1.20	1.60	92	-	Chlorination
6	Shahjahanpur	TW-2 Nos. OW-2 Nos. HP-18 Nos.	0.30	0.30	35	-	Chlorination
Uttar Pradesh							
1	Meerut	TW	150.00	150.00	142	One	Slow sand filter
2	Ghaziabad	TW	145.00	125.00	130	Nil	Chlorination
3	Bulandshahr	TW	14.00	12.00	75	Nil	Chlorination
4	Baraut	TW	6.00	4.00	50	Nil	Chlorination
5	Mawana	TW	5.80	3.13	30	Nil	Chlorination
6	Pilkhua	TW- 4	4.50	3.48	50		Chlorination
7	Muradnagar	TW	3.00	2.88	40	Nil	Chlorination
8	Garhmukteshwar	TW	3.96	3.00	99	Nil	Chlorination
9	Baghpat	TW	0.53	0.38	95	Nil	Chlorination
10	Dasna	TW	2.00	2.00	81	Nil	Chlorination
11	Phalauda	TW	0.35	0.35	28	Nil	Chlorination
NCT-Delhi							
		River Yamuna	90 MGD	NA	225	Chandrawal WTP I & II	Conventional method
		River Yamuna	120 MGD	NA	-	Wazirabad WTP I, II & III	Conventional method
		Western Yamuna canal	200 MGD	NA	-	Haiderpur WTP I&II	Conventional method
		Western Yamuna canal	40 MGD	NA	-	Nangloi W.T.P.	Conventional method
		Ganga water	100 MGD	NA	-	Shahadara WTP	Conventional method
		Sub-surface water	81 MGD	-	-		Conventional method
		Total	631 MGD	640 MGD	225	5	
			2865 mld	2924 mld			

Note:

For remaining towns information was not available.

SSF: Slow Sand Filtration

RSF: Rapid Sand Filter

RF: Rapid Filtration

NCBWW: New Canal Based Water Works

Addl. Filtration Plant

PLAN OF ACTION AND PHASING-WATER

S. No.	Policies/Proposals	10 th Plan (2002-2007)	11 th Plan (2007-2012)	12 th Plan (2012-2017)	13 th Plan (2017-2021)
1	2	3	4	5	6
1.	<u>Blueprint for Water Resources in the Region:</u> Blueprint for water resources in the region including augmentation of drinking water should be prepared for NCR identifying all the potential surface water sources and ground water aquifers in the region and inter-basin transfer of water. This should include water mapping, desilting, augmentation of existing lakes/depressions for storage of rain/flood water, rain water harvesting, reuse and recycling of waste water, measures for conservation of water, inter basin transfer of water and include integrated land & water management for the region.	A detailed study will be needed to be taken up through an independent agency which will take about 2-3 years. This will lead to formulation of an Integrated Regional Scheme for augmentation of drinking water supply in the region.	Implementation and monitoring of the scheme to be done by the States.	Implementation and monitoring of the scheme to be done by the States.	Monitoring to be done to be done by the States.
2.	<u>Integrated Regional Schemes for Augmentation of Drinking Water Supply (surface and ground):</u> considering NCR as a single entity should be prepared. All the future planning for multi-purpose dams should be done considering the future demands of the NCR and not for NCT-Delhi only. Long term solutions should include construction of upstream reservoirs to store excess water during monsoon for use in lean period and inter-basin transfer of water such as Sarda-Yamuna link canal etc.	Scheme will be formulated on the basis of study at S. No. 1	Implementation and monitoring of the scheme to be done by the States.	Implementation and monitoring of the scheme to be done by the States.	Monitoring to be done by the States.
3.	<u>Norms and Standards:</u> § Rate of Water supply: <i>Urban</i> NCT-Delhi : 225 lpcd Population one lakh and above : 200 lpcd Population below one lakh : 135 lpcd <i>Rural</i> Spot Source : 70 lpcd Pipe supply : 100 lpcd § Unaccounted for water (UFW)-should be reduced to 15%	Should be implemented strictly by the participating States in their respective Sub-regions immediately and to be done in phases. In Phase I, all the towns getting water supply less than 100 lpcd should be taken up to enhance rate of water supply to 100 lpcd. Capacity of supply main and distribution system to be enhanced as per norms laid down in plan.	Augmentation of the capacities to be done based on increased demand. In Phase II, all the towns with population more than one lakh to be brought to 150 lpcd level and towns with population below one lakh to be brought 135 lpcd. Capacity of supply main and distribution system to be enhanced as per norms laid down in plan.	Augmentation of the capacities to be done based on increased demand. In Phase III, all the towns with a population one lakh and above should be brought to 200 lpcd supply level from 150 lpcd level. Capacity of supply main and distribution system to be enhanced as per norms laid down in plan.	Augmentation of the capacities to be done based on increase in demand due to increase in population.

S. No.	Policies/Proposals	10 th Plan (2002-2007)	11 th Plan (2007-2012)	12 th Plan (2012-2017)	13 th Plan (2017-2021)
1	2	3	4	5	6
4.	<u>Protection of Land for Ground Water Recharging:</u> Recent studies of Central Ground Water Board have revealed that additional exploitation to the extent of 1,816 mld (1.82 MCM/day), 454 mld (0.45 MCM/day) and 908 mld (0.91 mcm/day) could be made available by harvesting the ground water potential of aquifer system of river Yamuna, upper Ganga canal system and Ganga flood plains respectively falling within NCR. In the Sub-regional Plans and Master/Development Plans, all the flood plains and other ground water recharging areas such as ponds, lakes, other water bodies etc. should be identified and protected from the invasion by other land uses and encroachments. At least, 2-5% area should be earmarked under water bodies (natural as well as constructive) in the distribution of landuses.	The areas to be protected for ground water recharging have already been identified in the Plan on the basis of the study done by IIRS, Dehradun on "Geology, Geomorphology and Ground Water prospects for NCR". These areas should be protected in the sub-regional plans and master plans by the respective State governments and should be implemented on priority basis immediately.	State Governments to ensure protection of ground water recharging areas while undertaking the development works in their respective Sub-regions.	State Governments to ensure protection of ground water recharging areas while undertaking the development works in their respective Sub-regions.	State Governments to ensure protection of ground water recharging areas while undertaking the development works in their respective Sub-regions.
5.	Intensive urban development/induced developments/water consuming industries, should not to be recommended/proposed in grey/dark blocks of ground water potential.	State Governments to ensure its implementation in their respective Sub-regions and monitor the same on regular basis.	State Governments to ensure its implementation in their respective Sub-regions and monitor the same on regular basis.	State Governments to ensure its implementation in their respective Sub-regions and monitor the same on regular basis.	State Governments to ensure its implementation in their respective Sub-regions and monitor the same on regular basis.
6.	<u>Recycling of waste water for non drinking water use:</u> Recycling of waste water for non drinking water use should be promoted. All the town level urban irrigation for landscaping, hotels, industrial units, air-conditioning of large centrally air-conditioned buildings/institutions, large installations and other non-potable demands should be met through treated recycled waste water as per norms. At least 50% of the treated waste water should be recycled for these purposes and emphasis should be laid towards waste minimization, which will also help in improving the environment as a whole. Government may also provide liberal tax rebates for Institutions/ industries adopting recycling of waste water to compensate for the cost involved in treating waste water for recycling. No fresh water should be used for irrigation purpose if treated waste water is available.	To be implemented and monitored on regular basis by the respective State Governments. Initially it is to be implemented in institutions/hotels and new colonies under development/proposed to be developed. If required, enabling provisions in the respective acts of the local bodies may be made by the respective State Governments.	To be implemented and monitored on regular basis by the respective State Governments.	To be implemented and monitored on regular basis by the respective State Governments.	To be implemented and monitored on regular basis by the respective State Governments.

S. No.	Policies/Proposals	10 th Plan (2002-2007)	11 th Plan (2007-2012)	12 th Plan (2012-2017)	13 th Plan (2017-2021)
1	2	3	4	5	6
7.	Mass Awareness should be created among public through mass media with regard to saving water and waste minimization.	To be implemented and monitored by the respective State Governments.	To be implemented and monitored by the respective State Governments.	To be implemented and monitored by the respective State Governments.	To be implemented and monitored by the respective State Governments.
8.	Commercial Approach is required to be adopted by the local bodies for revenue generation. Water charges should cover at least O&M cost. The structure of the water tariff should be demand based and increase telescopically depending upon the monthly consumption and should be reviewed periodically as a built in mechanism to make the service self sustaining and a deterrent to wastage. Tariff for the recycled treated waste water should be fixed accordingly to encourage its non-potable uses such as gardening, horticulture and other uses referred above. "Public-Private Partnership" needs to be introduced for operation and maintenance of the water supply schemes.	States should improve water tariff by the end of 11 th Plan. Water tariff to be reviewed every five years by the State Governments.			
9.	<u>Institutional Capacity Building:</u> Water demand management and institutional capacity building measures, e.g. zoning, setting up a contingent valuation fund, transparent operation-maintenance, regulatory guidelines etc. for efficient operation of the system contribute towards improvement in the finances.	Capacity building is a continuous process and required to be taken up immediately by the respective State Governments. The Board should help the State Governments in conducting the courses for capacity building.			
10.	Emphasis should also be given to the quality of water as per BIS standards and CPHEEO Manual.	Constituent States to ensure the quality of water as per standards and ensure implementation from first year of the plan and future also.	Constituent States to ensure and monitor.	Constituent States to ensure and monitor.	Constituent States to ensure and monitor.
11.	<u>Allocation of Land for Water Treatment Plants and Water Distribution System:</u> Planning of the city must incorporate advance land allocations at appropriate places for different components of water treatment & distribution systems.	To be ensured by the constituent States/development authorities in the first year of the implementation of Plan and subsequently to follow the same.	To be ensured by the constituent States/development authorities.	To be ensured by the constituent States/development authorities.	To be ensured by the constituent States/development authorities.

S. No.	Policies/Proposals	10 th Plan (2002-2007)	11 th Plan (2007-2012)	12 th Plan (2012-2017)	13 th Plan (2017-2021)
1	2	3	4	5	6
12.	Provision for Special Component Plan for NCR should be made by the Planning Commission in the five-year plans and Sub-component Plans should be prepared by the respective State Governments. Centrally Sponsored Schemes for Infrastructure Development (drinking water supply, sewerage, sewage treatment plant, drainage, roads, power etc.) in NCR should be formulated with state share of 25%, central grant of 25% and remaining 50% could be interest bearing loan from NCRPB.	Respective State Governments, Central Ministries and Planning Commission to ensure the provision. Ministry of Urban Development and Poverty Alleviation to form a centrally sponsored scheme for the purpose.	Respective State Governments, Central Ministries and Planning Commission to ensure the provision. Centrally sponsored scheme to continue.	Respective State Governments, Central Ministries and Planning Commission to ensure the provision. Centrally sponsored scheme to continue.	Respective State Governments, Central Ministries and Planning Commission to ensure the provision. Centrally sponsored scheme to continue.
13.	<u>Investment Plan</u> : Total water requirement in the region would be 11,984 mld by the year 2021. Accordingly, there will be need to produce additional water and to strengthen/expand the water supply distribution system in the region. Total investment required for the production/augmentation of water would be about Rs. 5,992.15 crores by the year 2021 and for strengthening/expansion of distribution system/network, it would be about Rs.7,190.57 crores.	Fund requirement for drinking water supply is estimated to be Rs.2,637 crores.	Fund requirement for drinking water supply is estimated to be Rs.3,955 crores.	Fund requirement for drinking water supply is estimated to be Rs.3,955 crores.	Fund requirement for drinking water supply is estimated to be Rs.2,637 crores.

STATUS OF SEWERAGE IN NCR TOWNS

S. No.	Sub-region/Town	Sewerage System Combined/Separate	Coverage (in %)	Number of STP capacity (in mld)	Quantity generated (in mld)	Quantity intercepted for treatment (in mld)	Disposal to drain/river/ irrigation
1	2	3	4	5	6	7	8
Haryana							
1	Faridabad	Separate	65	1 No.-45 1 No.-50 1 No.-20	105.00	105.00	Agra canal Gaunchi drain/Yamuna Buria nala/Yamuna
2	Gurgaon	Separate	60	2 Nos.; 30 each	13.14	13.14	Najafgarh drain
3	Bahadurgarh	Separate	60	-	5.18	-	Drain No. 8
4	Panipat	Separate	50	2 Nos.; 10 and 35	28.80	28.80	Yamuna River
5	Rewari	Separate	70	-	9.08	-	Irrigation
6	Palwal	Separate	60	1 No, 12	4.43	4.43	Gaunchi drain
7	Rohtak	Separate	65	-	16.79	-	Drain No.8
8	Sonepat	Separate	40	1 No, 30	10.97	10.97	Drain No.6
9	Samalakha	Separate	60	-	1.30	-	Drain No. 6
10	Gohana	Separate	25	1No, 3.5	2.12	2.12	Drain No. 6
11	Gannaur	Separate	40	-	0.90	-	Drain No. 6
12	Jhajjar	Separate	65	-	3.00	-	Drain No. 8
13	Haily Mandi	Separate	75	-	0.65	-	Irrigation
14	Pataudi	Separate	-	-	0.80	-	Irrigation
15	Sohna	Separate	60	-	1.09	-	Irrigation
16	Hodel	Separate	-	-	2.90	-	Gaunchi drain
17	Nuh	Separate	30	-	0.51	-	Irrigation
18	Meham	Separate	-	-	1.01	-	Irrigation
19	Bawal	Separate	-	-	0.78	-	Irrigation
20	Village Kosli	Separate	-	-	0.74	-	Irrigation
21	Village Kundli	Separate	-	-	0.71	-	Drain No. 8
22	Village	Separate	-	-	0.83	-	Sahibi River
	Dharuhera	-	-	-	-	-	-
Rajasthan							
1	Alwar	Com/Sep. Partial	5	Nil	10.50	Nil	River Gajuka
2	Bhiwadi	Separate	3	Nil	0.02	Nil	Drain Matiala village
3	Khaithal	Separate	3	Nil	0.42	-	Sahibi River
4	Behror	Separate	-	-	0.45	-	-
5	Tijara	Separate	-	-	0.52	-	-
6	Shahjahanpur	Separate	-	-	0.09	-	-

S. No.	Sub-region/Town	Sewerage System Combined/Separate	Coverage (in %)	Number of STP capacity (in mld)	Quantity generated (in mld)	Quantity intercepted for treatment (in mld)	Disposal to drain/river/ irrigation
1	2	3	4	5	6	7	8
Uttar Pradesh							
1	Ghaziabad	Separate	70	2 Nos., 73 & 56	109.00	30	Drain/River
2	Meerut	-	30	Nil	80.00	-	-
3	Sayana	Nil	Nil	Nil	Nil	Nil	Nil
4	Dasna	Nil	-	-	-	-	-
5	Mawana	-	-	-	-	-	-
6	Hapur	Combined	40	58.60	586.00	Nil	Drain/Irrigation
7	Anoopshahar	No sewerage system	-	-	-	-	River Ganga
8	Bugrasi	Combined	85	-	-	-	-
9	Shikarpur	Nil	Nil	Nil	Nil	Nil	Nil
10	Bulandshahr	No sewerage system	-	-	-	-	-
11	Karkhodha(Meerut)	No sewerage system	-	-	-	-	-
12	Parikshit Garh	Nil	Nil	Nil	Nil	Nil	Nil
13	Babugarh	Only 85% individual houses have flush toilet system					
14	Phalawada Meerut	Nil	Nil	Nil	Nil	Nil	Nil
15	Pilkhuwa	-	-	-	-	-	-
16	Bhawan Bahadur Nagar, Bulandshahar	-	-	-	-	-	-
17	Baghpat	-	-	-	-	-	-
18	Karnawal	Nil	Nil	Nil	Nil	Nil	Nil
19	Baraut	No sewerage system	-	-	-	-	-
20	Baghpat	No sewerage system	-	-	-	Yamuna River	-
21	Daurala	-	-	-	-	-	-
22	Dankaur	-	-	-	-	-	Drain
23	Gulaothi	-	-	-	-	-	-
24	Muradnagar	-	-	-	-	-	-
25	Siwal Khas	Nil	Nil	Nil	Nil	Nil	Nil
26	Hastinapur	-	-	-	-	-	-
27	Chaproli (Bhagpat)	No sewerage system	-	-	-	-	-
NCT-Delhi							
1	NCT-Delhi	Separate		1828.00	2540.00	1500.00	Partly for irrigation and rest in river Yamuna

Note:

For remaining towns information was not available.

PLAN OF ACTION AND PHASING—SEWERAGE, SOLID WASTE MANAGEMENT, DRAINAGE AND IRRIGATION

S. No.	Policies/Proposals	10 th Plan (2002-2007)	11 th Plan (2007-2012)	12 th Plan (2012-2017)	13 th Plan (2017-2021)
1	2	3	4	5	6
SEWERAGE					
1.	Master Plans should be prepared for sewerage system and its treatment for all the identified towns.	To be prepared by the State governments by the year 2006.	Implementation and monitoring to be done by the States on regular basis.	Implementation and monitoring to be done by the States on regular basis.	Implementation and monitoring to be done by the States on regular basis.
2.	All identified towns should have cent percent sewerage system and should treat their sewage up to the desired standards. Existing townships/cities where existing sewerage system is in poor condition, these systems should be rehabilitated. Remaining towns may initially be provided with low cost sanitation systems followed by sewerage system with appropriate treatment facilities. All the urban villages should be provided with the facilities equivalent to the towns, within whose controlled areas they are located. Other rural areas should be provided with low cost sanitation (LCS) measures such as sanitary latrines, septic tanks and soak pits.	To be implemented in the towns with a population of 5 lakhs and above. LCS to be provided in the 30% area.	To be implemented in the towns with a population from 2-5 lakhs. LCS to be provided in the 40% area.	To be implemented in the towns with a population below 2 lakhs. LCS to be provided in the 30% area.	Upgradation/augmentation of capacities for the increased population. Upgradation/augmentation of capacities for the increased population.
3.	Master/Development Plans of the towns and cities should incorporate land allocations at appropriate locations for such facilities.	To be done immediately as per norms prescribed in the Regional Plan.	To ensure the compliance.	To ensure the compliance.	To ensure the compliance.
4.	Overall management of surface drains and sewerage system in a town with its effluent treatment facilities should be with single agency and policy of dual agencies should be discarded.	To be implemented immediately.	To ensure the compliance.	To ensure the compliance.	To ensure the compliance.
5.	Recycling of waste water for non drinking water use should be promoted to the extent of at least 50% of the waste water generated. If required, enabling provisions in the respective acts of the local bodies may be made by the respective state governments.	To be done immediately.	To ensure the compliance.	To ensure the compliance.	To ensure the compliance.

S. No.	Policies/Proposals	10 th Plan (2002-2007)	11 th Plan (2007-2012)	12 th Plan (2012-2017)	13 th Plan (2017-2021)
1	2	3	4	5	6
6.	Mass awareness should be created for waste minimization.	To be done immediately.	To ensure the compliance.	To ensure the compliance.	To ensure the compliance.
7.	Commercial approach is required to be adopted by the local bodies for revenue generation. Tariff should be so fixed that it meets at least the Operation and Maintenance cost of the sewerage system, if not the capital cost of the system. Introduction of sewage tax and improved recovery of taxes may help in reducing the revenue-expenditure gap. The structure of the sewage tax should be demand based and increased telescopically depending upon the monthly consumption of water and should be reviewed periodically as a built-in mechanism to make the service self sustaining and a deterrent to wastage. Public-private partnership needs to be introduced for operation and maintenance of the sewerage schemes and sewage treatment plants.	To be implemented immediately. States should improve water tariff by the end of 11th Plan.	To ensure the compliance. States should improve water tariff by the end of 11th Plan.	To review the tariff structure and if required to be enhanced.	To review the tariff structure and if required to be enhanced.
8.	Institutional capacity building measures should be adopted.	Capacity building is a continuous process and is required to be taken up immediately by the respective State governments. The Board should help the State governments in conducting the courses for capacity building. Training courses for capacity building to continue. Tariff to be reviewed.			
9.	External Development Charges (EDC) should be proportionately spent for the development of physical infrastructure in the existing township and new area under development.	To be done immediately	To ensure the compliance	To ensure the compliance	To ensure the compliance
10.	Provision for Special Component Plan for NCR in the five-year plan and Sub-component Plan by the State governments should be made. Centrally Sponsored Schemes for Infrastructure Development in NCR should be formulated and implemented.	Should be implemented immediately	To ensure implementation	To ensure implementation	To ensure implementation
11.	Total estimated sewage generation in the urban areas of the region is estimated to be 6,935 mld by the year 2021 and accordingly, there will be need to strengthen/expand the sewerage system and its treatment capacities in the region. Total investment required for laying of sewerage system would be	Fund requirement for laying of sewerage system is estimated to be Rs.1,248.29 crores.	Fund requirement for laying of sewerage system is estimated to be Rs.2,912.68 crores.	Fund requirement for laying of sewerage system is estimated to be Rs.2,496.58 crores.	Fund requirement for laying of sewerage system is estimated to be Rs.1,664.39 crores.

S. No.	Policies/Proposals	10 th Plan (2002-2007)	11 th Plan (2007-2012)	12 th Plan (2012-2017)	13 th Plan (2017-2021)
1	2	3	4	5	6
	Rs.3,467.47 crore by the year 2021 and for treatment of waste water, the investment would amount to Rs. 4,854.46 crores.				
SOLID WASTE MANAGEMENT					
1.	All the towns in NCR should prepare detailed Solid Waste Management Plan as per directions of the Ministry of Environment & Forests and Norms & Standards given in the Manual of CPHEEO, MOUD&PA.	Should be prepared immediately compliance by the respective State Governments.	Respective State governments to ensure the implementation of the Plan.	Respective State governments to ensure the implementation of the Plan.	Respective State governments to ensure the implementation of the Plan.
2.	Land for treatment/disposal of solid waste should be earmarked while preparing the Master/Development Plan for various towns/cities. The acquisition of these sites by the Development Authorities and Municipalities should form a compulsory element of the development programme and properly budgeted for in their Plan documents.	To be done immediately compliance by the respective State Governments.	To ensure the compliance by the respective State Governments.	To ensure the compliance by the respective State Governments.	To ensure the compliance by the respective State Governments.
3.	The policy of waste minimization through recycling /recovery of resources should be adopted- at least 50% of the Solid Waste generated should be disposed off through other treatment technologies like composting and the balance through sanitary landfill.	To be done immediately compliance by the respective State Governments.	To ensure the compliance by the respective State Governments.	To ensure the compliance by the respective State Governments.	To ensure the compliance by the respective State Governments.
4.	Institutional capacity building measures should be taken including involvement of NGO's/Private Sector to improve the efficiency and effectiveness of Solid waste management at each stage such as waste collection, transfer/transportation, treatment and disposal. Local bodies and Panchayats should improve their financial conditions through better financial management and should also improve the revenue generation capacities	Capacity building is a continuous process and is required to be taken up immediately by the respective State governments. The Board should help the State governments in conducting the courses for capacity building. States should improve water tariff by the end of 11th Plan. Training courses for capacity building to continue. Tariff to be reviewed.			
5.	In the rural areas, there is no mechanism for collection and disposal of solid waste. This should be developed by associating local Panchayats.	All the urban villages to be covered in Tenth Plan.	Other villages to be covered by the end of Eleventh Plan.	To ensure the compliance by the respective State Governments.	To ensure the compliance by the respective State Governments.

S. No.	Policies/Proposals	10 th Plan (2002-2007)	11 th Plan (2007-2012)	12 th Plan (2012-2017)	13 th Plan (2017-2021)
1	2	3	4	5	6
6.	Total solid waste generation in the urban areas of the region would be about 27,236 MT/day by the year 2021 and accordingly there will be need to develop appropriate system for collection, transportation and disposal of solid waste in environmental friendly manner either through properly designed sanitary land filling or through other treatment methods. Total investment required for this would be about Rs.1,361.81 crores upto the year 2021.	Investment for solid waste management is estimated to be Rs. 544.73 crores.	Investment for solid waste management is estimated to be Rs. 340.45 crores.	Investment for solid waste management is estimated to be Rs. 272.36 crores.	Investment for solid waste management is estimated to be Rs. 204.27 crores.
DRAINAGE					
1.	Urban drainage system should be designed for maximum rainfall of five years frequency storm for internal as well as peripheral drains and ten years frequency storm for the main drains.	Should be adopted immediately by the respective State Governments.	To ensure the compliance by the respective State Governments.	To ensure the compliance by the respective State Governments.	To ensure the compliance by the respective State Governments.
2.	Integrated Regional Drainage Plan at the regional level and Drainage Master Plans at the District level should be prepared for enhancing the quality of regional and local drains taking into account the present/future development and settlement pattern in the region. All the related works at the regional level should be coordinated by a single agency.	Drainage Master Plans at the District level need to be prepared by the constituent State Governments and to be part of Blue print for water resources in the region indicated in policy at S. No. 1 of water.	Implementation and monitoring to be done by the respective State Governments.	Implementation and monitoring to be done by the respective State Governments.	Implementation and monitoring to be done by the respective State Governments.
3.	Measures should be taken to prevent the use of storm water drains for conveying sewage, dumping of solid wastes, sludge and unauthorized development/slum dwellings.	It should be implemented by the respective State Governments immediately.	Implementation and monitoring to be done by the respective State Governments.	Implementation and monitoring to be done by the respective State Governments.	Implementation and monitoring to be done by the respective State Governments.
4.	Investment required in this sector will depend upon the district Level drainage Master Plans to be prepared by the respective State governments and there Integrated Regional Drainage Plan. Provisions for fund requirement will have to be made by the constituent States on the basis of district level Drainage Master Plans on the same lines as for the irrigation channels.	To be implemented by the respective State Governments immediately.	Implementation and monitoring to be done by the respective State Governments.	Implementation and monitoring to be done by the respective State Governments.	Implementation and monitoring to be done by the respective State Governments.

S. No.	Policies/Proposals	10 th Plan (2002-2007)	11 th Plan (2007-2012)	12 th Plan (2012-2017)	13 th Plan (2017-2021)
1	2	3	4	5	6
IRRIGATION					
	Integrated Water Resource Management Approach for the region is required for optimum water resources utilization and demand management.	It should form part of Blue print for water resources in the region indicated in policy at S. No. 1 of water.	Implementation and monitoring to be done by the respective State Governments.	Implementation and monitoring to be done by the respective State Governments.	Implementation and monitoring to be done by the respective State Governments.
	Augmentation of water resources should be done through adopting rain water harvesting (micro and macro) and recycling/reuse of treated waste water.	To be implemented by the respective State Governments immediately.	Implementation and monitoring to be done by the respective State Governments.	Implementation and monitoring to be done by the respective States.	Implementation and monitoring to be done by the respective States.
	Sprinkler/drip irrigation should be promoted to save water. Cropping pattern should be decided on the basis of availability of water.	It should be implemented by the respective State Governments immediately.	Implementation and monitoring to be done by the respective State Governments.	Implementation and monitoring to be done by the respective State Governments.	Implementation & monitoring to be done by the respective State Governments.

ANNEXURE 9/III

STATUS OF SOLID WASTE IN NCR TOWNS

S. No.	Sub-region/Town	Quantity produced (MT/day)	Number of Collection centres	Number of transfer stations	Average travel Distance for disposal (km)	Number of Landfill Sites		Disposal by other means			
						Environmental friendly	Non-environmental friendly	Composting	Incineration	Pellatisation	Others
1	2	3	4	5	6	7	8	9	10	11	12
Haryana											
1	Faridabad	461	-	-	7.0	1	4	-	-	-	Yes
2	Gurgaon	74	-	-	6.0	-	3	-	-	-	Yes
3	Bahadurgarh	34	-	-	4.0	-	2	-	-	-	Yes
4	Panipat	106	-	-	5.0	-	3	-	-	-	Yes
5	Rewari	44	-	-	4.0	-	2	-	-	-	Yes
6	Palwal	29	-	-	3.0	-	2	-	-	-	Yes
7	Rohtak	111	-	-	6.0	-	3	-	-	-	Yes
8	Sonepat	73	-	-	5.0	-	3	-	-	-	Yes
9	Samalakha	10	-	-	3.0	-	1	-	-	-	Yes
10	Gohana	16	-	-	2.0	-	2	-	-	-	Yes
11	Gannaur	11	-	-	1.5	-	1	-	-	-	Yes
12	Jhajjar	12	-	-	2.0	-	2	-	-	-	Yes
13	Haily Mandi	7	-	-	2.0	-	1	-	-	-	Yes
14	Patudi	6	-	-	2.5	-	1	-	-	-	Yes
15	Sohna	8	-	-	1.5	-	1	-	-	-	Yes
16	Hodel	14	-	-	1.5	-	1	-	-	-	Yes
17	Nuh	3	-	-	2.0	-	1	-	-	-	Yes
18	Meham	8	-	-	1.5	-	1	-	-	-	Yes
19	Bawal	4	-	-	2.0	-	1	-	-	-	Yes
20	Village Kosli	4	-	-	1.5	-	1	-	-	-	Yes
21	Village Kundli	3	-	-	1.5	-	1	-	-	-	Yes
22	Village Dharuhera	9	-	-	2.0	-	1	-	-	-	Yes
Rajasthan											
1	Alwar	45	1145	4	2.5	-	5	-	-	-	Yes
2	Bhiwadi	3	-	3	1.0	-	4	-	-	-	Yes
3	Khairthal	4.4	-	1	-	-	1	-	-	-	Yes
4	Behror	3.2	-	4	-	-	4	-	-	-	Yes
5	Tijara	3	-	2	-	-	1	-	-	-	Yes
6	Shahjahanpur	0.14	-	1	-	-	1	-	-	-	Yes

S. No.	Sub-region/Town	Quantity produced (MT/day)	Number of Collection centres	Number of transfer stations	Average travel Distance for disposal (km)	Number of Landfill Sites		Disposal by other means			
						Environmental friendly	Non-environmental friendly	Composting	Incineration	Pellatisation	Others
1	2	3	4	5	6	7	8	9	10	11	12
Uttar Pradesh											
1	Ghaziabad and Loni	500	465	-	-	-	-	Nil	Nil	Nil	-
2	Meerut	580	60	22	-	Nil	4 Hapur bypass Near RTO office Hapur road Delhi road	Nil	Nil	Nil	Dumping on old track
3	Sayana	16	Nil	Nil	-	Nil	Nil	Nil	Nil	Nil	Nil
4	Nagar Panchayat Dasna	-	-	-	-	-	-	-	-	-	-
5	Mawana	28	70	4	-	1	3	x	x	x	-
6	Hapur	80	15	2	-	2	2	-	-	-	-
7	Anoopshahar	12	15	2	-	-	2	-	-	-	-
8	Nagar Panchayat Bugrasi	-	-	-	-	-	2	-	-	-	-
9	Shikarpur	16	4	-	-	-	-	-	-	-	-
10	Nagar Palika Bulandshahr	71	2	-	-	-	2	-	-	-	-
11	Kharkhoda	-	-	-	-	-	3	-	-	-	-
12	Prikshit Garh	-	-	-	-	2	-	-	-	-	-
13	Babugarh	-	-	-	-	2 Depressions	-	-	-	-	-
14	Nagar Panchayat Phalwada	-	-	-	-	-	-	Combined Pond	-	-	-
15	Pilkhuwa	28	17	7	-	-	3	-	-	-	-
16	Nagar Panchayat B.B. Nagar (Bulandshahr)	-	-	-	-	-	3	-	-	-	-
17	Khekra	-	-	-	-	2	-	-	-	-	-
18	Karnawal	-	-	-	-	4	Nil	Nil	Nil	Nil	Nil
19	Baraut	40	-	-	-	3	-	-	-	-	-
20	Baghpat	16	-	-	-	1	-	-	-	-	-
21	Dourala	-	-	-	-	-	2	-	-	-	-
22	Nagar Panchayat Dankaur	-	-	-	-	4	0	-	-	-	-
23	Gulothi	-	-	-	-	-	3	-	-	-	-
24	Muradnagar	32	-	-	-	3	-	-	-	-	-
25	Nagar Panchayat Siwal Khas	-	-	-	-	4	Nil	-	-	-	-
26	Hastinapur	-	-	-	-	-	4	-	-	-	-
27	Chaproli	-	-	-	-	-	-	-	-	-	-

STATUS OF DELS, SWITCH CAPACITY AND WAITING LIST FOR NCR TOWNS

S. No.	NCR Town	Telecom Circle	Status as on 31.07.2001			Status as on 30.08.2003		
			Switch Capacity	DEls	W/L	Switch Capacity	DEls	W/L
1	2	3	4	4	5	7	8	9
CNCR Town								
1	Faridabad	Haryana	84,630	76,462	6,790	1,13,500	87,019	434
2	Ballabhgarh	Haryana	18,500	16,814	927	23,000	17,912	0
3	Bahadurgarh	Haryana	14,500	11,030	861	26,300	15,141	268
4	Gurgaon	Haryana	1,01,300	8,16,531	4,423	1,37,800	90,142	1,133
5	Kundli	Haryana	2,500	2,132	225	6,600	3,010	0
6	Ghaziabad	U.P. (west)	1,18,500	1,04,632	4,351	1,64,000	1,20,060	657
6a.	Ghaziabad WLL	U.P. (west)	--	--	--	1,000	750	0
7	Noida	U.P. (west)	95,256	81,900	350	1,25,756	9,33,441	501
7a.	Noida WLL	U.P. (west)	--	--	--	4,000	3,259	0
8	Loni	U.P. (west)	5,500	4,568	1,472	12,000	9,099	190
Sub-total			4,40,686	3,79,191	19,399	6,13,956	12,79,833	3,183
Priority Town								
9	Rohtak	Haryana	38,006	31,271	429	57,250	38,048	1,107
10	Rewari	Haryana	10,000	9,885	2,083	18,600	14,874	859
11	Palwal	Haryana	9,000	7,899	628	13,500	10,549	304
12	Panipat	Haryana	40,900	35,840	1,029	59,350	47,619	158
13	Dharuhera	Haryana	1,500	1,445	421	3,800	2,558	170
14	Meerut	U.P. (west)	94,000	79,632	2,808	1,11,000	80,887	978
14a.	Meerut WLL	U.P. (west)	--	--	--	5,000	1,429	625
15	Bulandshahr	U.P. (west)	17,500	12,906	2,260	21,500	16,332	590
15a.	Bulandshahr WLL	U.P. (west)	--	--	--	1,000	310	0
16	Khurja	U.P. (west)	9,000	5,282	1,820	11,500	8,082	558
17	Hapur	U.P. (west)	16,000	13,212	1,108	19,100	17,587	140
18	Alwar	Rajasthan	31,000	24,917	114	37,488	32,613	264
19	MIA-Alwar	Rajasthan	1,400	1,204	35	1,400	1,207	80
20	Bhiwadi	Rajasthan	6,000	4,362	233	9,600	8,196	57
21	Sonepat		--	--	--	35,868	28,126	0
Sub-total			2,74,306	2,27,855	12,968	4,05,956	3,08,417	5,890
Counter Magnet Town								
22	Gwalior	M.P.	78,256	61,704	Nil	91,992	74,096	0
23	Patiala	Punjab	57,000	52,851	368	71,000	53,326	265
24	Patiala Cel.	Punjab	--	--	--	10,400	8,958	0
25	Hissar	Haryana	37,500	29,164	857	55,250	37,046	521
26	Kota	Rajasthan	58,000	51,069	Nil	91,196	71,889	58
27	Bareilly	U.P. (west)	49,500	44,794	1,320	71,900	54,502	494
Sub-total			2,80,256	2,39,582	2,545	3,91,738	2,99,817	1,338
Total			9,95,248	8,46,628	34,912	14,11,650	18,88,067	10,411

STATUS OF PROVISION OF VALUE ADDED SERVICES IN THE NCR TOWNS

S. No.	Value Added Services (status as on 31.07.2001)					
	NCR Town	Internet	Pager	Cellular Mobile Phone	ISDN	Data I-Net
1	2	3	4	5	6	7
1	Faridabad	A	A	A	A	A
2	Ballabhgarh	A	A	A	A	
3	Bahadurgarh	A	A	A	A	X
4	Gurgaon	A	A	A	A	A
5	Rohtak	A	A	A	A	A
6	Rewari	A	A	A	A	X
7	Palwal	A	A	A	A	X
8	Panipat	A	A	A	A	X
9	Dharuhera	A	A	A	A	X
10	Kundli	A	A	A	X	X
11	Ghaziabad	A	A	A	A	A
12	Noida	A	A	A	A	A
13	Loni	A	A	A	A	A
14	Meerut	A	A	A	A	A
15	Bulandshahr	A	A	A	A	A
16	Khurja	A	A	A	A	A
17	Hapur	A	A	A	A	A
18	Alwar	A	X	X	X	A
19	MIA-Alwar	A	X	X	X	A
20	Bhiwadi	A	X	X	X	A
21	Gwalior	A	A	A	A	A
22	Patiala	A	A	A	A	A
23	Hissar	A	A	A	A	X
24	Kota	A	A	A	A	A
25	Bareilly	A	A	A	A	A

Note:

A - Facility available

X - Facility not available

REQUIREMENT OF FUNDS FOR TELECOMMUNICATIONS

S. No	NCR Town	Telecom Circle	2001		2006			2011		
			Population (Person)	Tel-density	Population (Person)	New Lines Required	Investment Required (in Rs.)	Population (Person)	New Lines Required	Investment Required (in Rs.)
1	2	3	4	5	6	7	8	9	10	11
Metro and Regional Centres within Central NCR										
1	Faridabad	Haryana	10,54,981	8.84	14,28,377	70,987	19,16,657	18,01,772	42,940	11,59,393
2	Bahadurgarh	Haryana	1,31,924	8.36	2,18,002	14,040	3,79,085	3,04,079	9,899	267,271
3	Gurgaon	Haryana	2,29,243	35.62	3,07,994	-46,234	0	3,86,744	-37,177	0
4	Kundli	Haryana	--	--	0	-2,132	0	--	-2,132	0
5	Ghaziabad	U.P. (west)	9,68,521	10.80	14,00,740	56,453	15,24,232	18,32,958	49,705	13,42,038
6	Noida	U.P. (west)	2,93,908	27.87	4,41,745	-31,099	0	5,89,581	-14,098	0
7	Loni	U.P. (west)	1,20,659	3.79	2,59,430	25,266	6,82,193	3,98,200	15,959	4,30,882
		Sub-total	27,99,236	13.55	40,56,285	1,66,747	45,02,166	53,13,334	1,18,503	31,99,585
Metro and Regional Centres outside Central NCR										
1	Rohtak	Haryana	5,16,624	6.05	6,04,511	38,248	10,32,688	6,92,397	10,107	2,72,888
2	Rewari	Haryana	1,36,305	7.25	1,65,732	9,174	2,47,701	1,95,158	3,384	91,369
3	Palwal	Haryana	1,00,528	7.86	1,35,664	7,702	2,07,964	1,70,800	4,041	1,09,097
4	Panipat	Haryana	2,91,521	12.29	3,48,495	4,237	1,14,395	4,05,468	6,552	1,76,903
5	Dharuhera	Haryana	100,946	1.43	1,18,099	12,136	3,27,681	1,35,251	1,973	53,259
6	Meerut	U.P. (west)	16,76,271	4.75	19,38,706	1,43,319	38,69,618	22,01,141	30,180	8,14,861
7	Bulandshahr	U.P. (west)	1,76,256	7.32	2,10,243	11,272	3,04,341	2,44,229	3,908	1,05,528
8	Khurja	U.P. (west)	98,403	5.37	1,09,492	7,310	1,97,357	1,20,580	1,275	34,430
9	Hapur	U.P. (west)	2,11,987	6.23	2,59,617	16,644	4,49,387	3,07,247	5,477	1,47,891
10	Alwar	Rajasthan	2,65,850	9.83	3,01,085	8,504	2,29,602	3,36,320	4,052	1,09,405
11	Bhiwadi	Rajasthan	33,830	12.89	54,353	1,889	50,991	74,875	2,360	63,722
		Sub-total	36,08,521	6.31	42,45,994	2,60,434	70,31,725	48,83,466	73,309	19,79,352
		Total	64,07,757	9.47	83,02,279	3,47,716	1,15,33,891	1,01,96,800	2,17,870	51,78,937

Note:

Proposed Tele-density (Number of Telephones/100 persons): 11.5

POLICIES AND STRATEGIES OF VARIOUS SECTORS 2021

S. No. 1	Sector 2	Sector Policy 3	Strategies 4	Agency Responsible 5																																																											
1.	Demography and settlement pattern	Spread of the developmental impulse of Delhi to whole of NCR by providing economic base and infrastructure to selected urban settlements, developing small & medium towns and rural areas, providing effective transportation system, rationalizing use of land, encouraging private participation, etc.	<p>The following towns are prioritized for development to achieve balanced growth in NCR. Their population assignments for 2011 and 2021 and their future economic base will be as follows:</p> <table border="1"> <thead> <tr> <th rowspan="2">Town/Complex</th> <th colspan="2">Population (in lakhs)</th> </tr> <tr> <th>2011</th> <th>2021</th> </tr> </thead> <tbody> <tr><td>Faridabad-Ballabgarh</td><td>16.00</td><td>25.00</td></tr> <tr><td>Gurgaon-Manesar</td><td>4.50</td><td>16.50</td></tr> <tr><td>Ghaziabad-Loni</td><td>19.00</td><td>30.19</td></tr> <tr><td>NOIDA</td><td>6.00</td><td>12.00</td></tr> <tr><td>Sonepat-Kundli</td><td>3.50</td><td>10.00</td></tr> <tr><td>Greater NOIDA</td><td>7.00</td><td>12.00</td></tr> <tr><td>Meerut</td><td>15.00</td><td>22.00</td></tr> <tr><td>Bahadurgarh</td><td>2.00</td><td>3.00</td></tr> <tr><td>Panipat</td><td>5.00</td><td>7.00</td></tr> <tr><td>Rohtak</td><td>4.20</td><td>6.00</td></tr> <tr><td>Palwal</td><td>1.70</td><td>4.00</td></tr> <tr><td>Rewari-Dharuhera-Bawal</td><td>2.00</td><td>4.00</td></tr> <tr><td>Hapur-Pilkhua</td><td>3.00</td><td>4.50</td></tr> <tr><td>Bulandshahr-Khurja</td><td>3.70</td><td>4.77</td></tr> <tr><td>Baghpat-Baraut</td><td>1.60</td><td>3.00</td></tr> <tr><td>Alwar</td><td>3.40</td><td>4.50</td></tr> <tr><td>Greater Bhiwadi</td><td>1.00</td><td>3.00</td></tr> <tr><td>Shahjahanpur-Neemrana-Behror</td><td>1.00</td><td>3.00</td></tr> </tbody> </table> <p>At the Sub-regional level, the hierarchy of settlements including rural clusters will be detailed out.</p>	Town/Complex	Population (in lakhs)		2011	2021	Faridabad-Ballabgarh	16.00	25.00	Gurgaon-Manesar	4.50	16.50	Ghaziabad-Loni	19.00	30.19	NOIDA	6.00	12.00	Sonepat-Kundli	3.50	10.00	Greater NOIDA	7.00	12.00	Meerut	15.00	22.00	Bahadurgarh	2.00	3.00	Panipat	5.00	7.00	Rohtak	4.20	6.00	Palwal	1.70	4.00	Rewari-Dharuhera-Bawal	2.00	4.00	Hapur-Pilkhua	3.00	4.50	Bulandshahr-Khurja	3.70	4.77	Baghpat-Baraut	1.60	3.00	Alwar	3.40	4.50	Greater Bhiwadi	1.00	3.00	Shahjahanpur-Neemrana-Behror	1.00	3.00	<p>The concerned Development Authorities will prepare the Development Plan based on the Population assignments and review the same after ten years in consultation with the NCRPB and ensure incorporation of policies of Regional Plan-2021 in their Master/Development Plans.</p> <p>The NCR Cells of the concerned State will prepare the Sub-regional Plan in consultation and with approval of the Board.</p>
Town/Complex	Population (in lakhs)																																																														
	2011	2021																																																													
Faridabad-Ballabgarh	16.00	25.00																																																													
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Hapur-Pilkhua	3.00	4.50																																																													
Bulandshahr-Khurja	3.70	4.77																																																													
Baghpat-Baraut	1.60	3.00																																																													
Alwar	3.40	4.50																																																													
Greater Bhiwadi	1.00	3.00																																																													
Shahjahanpur-Neemrana-Behror	1.00	3.00																																																													
2.	Economic Base	<ul style="list-style-type: none"> Integrated policy for the region as a whole should be pursued at the sub-regional level so as to effectuate the broader objectives of the Regional Plan-2021 by fostering rapid economic growth and achieving balanced 	<ul style="list-style-type: none"> The proposals/strategies/action plans at the sub-regional/ district level/town level should be dovetailed from the policy envisaged in the Regional Plan-2021. 	<p>The NCR Cells of the concerned State will incorporate the broad policies of Regional Plan-2021 at sub-regional level in consultation and with approval of the Board.</p>																																																											

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1	2	3	4	5
		<p>development of the region.</p> <ul style="list-style-type: none"> Change basic character of regional economy from the agricultural and pre- industrial to more diversified one. A balanced policy for development of economic activities should be adopted in NCR for identified policy zones. 		The State Government Policy will also be in coterminous with the policy of Regional Plan-2021
i)	Industry	<ul style="list-style-type: none"> Decentralization of industries 	<p>For <u>NCT-Delhi</u></p> <ul style="list-style-type: none"> Only those industries related to marketing and/or providing consumer needs will be allowed in Delhi Only hi-tech industries should be allowed in Delhi In the existing industrial areas, low-tech industries should be converted into hi-tech and those which are unable should be phased out within reasonable time <p>For <u>CNCR areas</u></p> <ul style="list-style-type: none"> No hazardous/ polluting industries should be allowed Hi-tech industries should be allowed to flourish Industries existing before 1986 will conform to EPA, 1986 <p>For <u>rest of NCR</u></p> <ul style="list-style-type: none"> All towns selected for priority development should have a strong industrial base and appropriate incentives should be given for setting of units Local development authorities of the towns will prepare plans for adequate industrial areas along with infrastructure facilities 	State Industrial departments, local development authorities and State Pollution Control Boards of the respective States.
ii)	Wholesale Trade and Commerce	<ul style="list-style-type: none"> Wholesale trade based upon nature of use and catchments to be served. 	<p>For <u>NCT-Delhi</u></p> <ul style="list-style-type: none"> No preferential treatment or low taxes to be given for wholesale trade in Delhi No new wholesale market should be established in Delhi <p>For <u>CNCR areas</u></p> <ul style="list-style-type: none"> Commodities which require bulk handling such as PVC goods, chemicals, timber, iron & steel, food grains, building materials and commodities which are hazardous in nature. <p>For <u>rest of NCR</u></p> <ul style="list-style-type: none"> Adequate incentives should be given in order to encourage and accelerate growth of trade centres as proposed below within 	<p>Sales Tax Department, GNCTD</p> <p>Delhi Development Authority in its MPD-2021 should address this issue adequately.</p> <p>Local development authorities will ensure to make provision in their respective master plans, and provide infrastructure thereof.</p> <p>Concerned State Government will provide adequate incentives for establishing such trade centres in</p>

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			NCR.	the listed cities and the local development authorities will ensure to make provision in their respective Master Plans, and provide infrastructure thereof.
iii)	Government/ Public Sector and Commercial/ Corporate Offices	<ul style="list-style-type: none"> Relocate offices based upon nature of working and its importance. 	<p>For <u>NCT-Delhi</u></p> <ul style="list-style-type: none"> Only those central government offices which perform ministerial, protocol functions will be within national capital. All other offices including public sector offices should be shifted from Delhi No new office spaces should be created in newly developed community, district or sub city and city centres. No unauthorized change of land/ building use should be allowed. <p>For <u>CNCR areas</u></p> <ul style="list-style-type: none"> Relocation or expansion of government offices/ PSUs which need to perform ministerial, protocol, liaisoning functions which make it incumbent upon them to be located in Delhi alone, should be allowed in CNCR. <p>For <u>rest of NCR</u></p> <ul style="list-style-type: none"> All Central government offices and PSUs which are considered for shifting from Delhi should be located in any other town of NCR. 	<p>Ministry of Urban Development, GoI.</p> <p>Ministry of Urban Development, GoI, Delhi Development Authority and MCD.</p> <p>Ministry of Urban Development and all local authorities.</p> <p>Ministry of Urban Development and all local authorities.</p>
iv)	Other Economic Activities	<ul style="list-style-type: none"> To make NCR as Common Economic Zone (CEZ). 	<ul style="list-style-type: none"> Rationalization of tax structure Extending Uniform Financial/Banking services Removing the restrictions on Inter-State movement of taxis and auto rickshaws among NCR States Providing uniform telecom facilities 	<p>Ministry of Finance and State Finance departments.</p> <p>Ministry of Finance and Reserve Bank of India</p> <p>Ministry of Shipping, Road Transport and Highways and State transport departments.</p> <p>Ministry of Communications and Information Technology.</p>

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			<ul style="list-style-type: none"> • Providing uniform power supply • Integrated Education Policy • Integrated law and order machinery 	<p>Ministry of Power, Central Electricity Authority and State Electricity Boards.</p> <p>Ministry of HRD, UGC, AICTE and State education departments.</p> <p>Ministry of Home Affairs and State Police departments.</p>
3.	Rural Development	<ul style="list-style-type: none"> • Less developed districts should be identified and agriculture and rural development should be given priority by inducing growth through promoting agro-based industries and by providing adequate agriculture marketing by evolving a Common “Specified Commodities Marketing Act” on the lines of Agricultural Produce Marketing Act, to enable the dispersal of Wholesale Distributive Trades to the NCR towns. 	<ul style="list-style-type: none"> • The Sub-regional Plan for the concerned area of the participating States should not only be reflecting broad policy of Regional Plan-2021 but also should reinforce backward and forward linkages by evolving a hierarchical settlement system at lowest level. • The District Plans should be prepared with emphasis on agriculture and rural development and should be coterminous with policies of Regional Plan-2021 	<p>The NCR Cells of the concerned State will incorporate the broad policies of Regional Plan-2021 at Sub-regional level in consultation and with approval of the Board.</p> <p>The concerned District Collectors will ensure preparation of District development Plans as per 73rd and 74th CAA. And the policy should be in consonance with the broad policy of the Regional Plan-2021.</p>
4.	Regional Land Use	<ul style="list-style-type: none"> • The proposed Land Use 2021 broadly addresses the issues of natural conservation, over congestion, high development pressure, and sufficient green spaces which should be further reflected in the Sub-regional and Master Plans. 	<p>Four major zones have been identified as follows:</p> <ul style="list-style-type: none"> • <u>Regulated Area Zone</u>: Intense pressure of development, should be effectively controlled and monitored, all controlled areas/development areas declared by respective State governments will be deemed as regulated area zones, no development in this zone can be undertaken except in accordance with the Master/Development Plan for respective areas as approved by the Board and notified by the State government. • <u>Highway Corridor Zone</u>: A width of 500 m. on either side of the ROW of national highways outside the controlled/development area, a regulated zone is to be provided, within which necessary planned development should be undertaken by the concerned State Government after taking into account the restriction of green buffer zone spelt out in the Regional Plan. 	<p>Respective State Governments, NCR Cells, local/development authorities.</p> <p>Ministry of Shipping, Road Transport and Highways, NHAI, District Collectors, development/local authorities and Forest departments.</p>

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			<ul style="list-style-type: none"> <u>Natural Area Conservation Zone:</u> All major natural features identified as environment sensitive areas are to be protected in this zone. Broad policies indicated in the Regional Plan should be further elaborated in the Sub-regional Plans and Master Plans. <u>Agricultural Area Zone outside development/controlled areas:</u> to be regulated and guided by Village/Block Plans to be drawn under district planning process and this zone may be designated for primary sector production. 	<p>Respective state Governments, NCR Cells, local authorities, State tourism department and local revenue authorities.</p> <p>District Collectors and local revenue authorities.</p>
5.	Environment and Disaster Management	<ul style="list-style-type: none"> All natural features such as ridges, rivers, streams, paleo channels etc. are to be conserved. Preserve good agricultural land Protect and conserve both surface and ground water resources. Database for air and water quality and noise/land pollution to be created. While carrying out activities for development, provision under EPA 1986 and rules thereof to be followed. A Disaster management/post-disaster management Plan to be prepared. 	<ul style="list-style-type: none"> In order to protect the natural features, a minimum distance from the edge of any of the natural features should be demarcated as a 'No Development Zone' at the Sub-regional and local level. No agriculture land will be allowed for conversion to non-agriculture use. Land use allocation to be done carefully in the Sub-Regional/Master Plans in order to protect/conserv surface/ground water resources. Ground water recharging area identified in the Regional Plan should be further elaborated in the Sub-Regional/Master Plan and policies in these plans should be further elaborated to protect them. Based on the appropriate database, planning and development should be done on the carrying capacity concept for sustainable development of the region. Database for occurrence of hazardous, damage cost in the building & infrastructure and economic losses suffered to be created and Disaster management Plans to be prepare. These plans to be incorporated in Sub-Regional/District/Master Plans. Amendments in the present building bye-laws, town planning acts, municipal acts etc. to be carried out to include safety aspects from natural/man-made hazardous. Guidelines to be prepared. 	<p>All NCR Cells should ensure that this provision has been incorporated in their Sub-regional/Master Plans of the concerned States. All local/development authorities to ensure implementation.</p> <p>Department of Environment & Forests, Pollution control boards, local bodies, development authorities, District Collectors and other departments of concerned States</p> <p>All NCR Cells should ensure that this provision has been incorporated in their Sub-regional/Master Plans of the concerned States. All local/development authorities to ensure implementation.</p>

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6.	Tourism and Heritage	<ul style="list-style-type: none"> • Tourism to be an employment generating activity • All tourism sites including monuments/heritage areas/natural heritage sites etc. should be identified and adequately protected and conserved. 	<ul style="list-style-type: none"> • State Governments should prepare tourism development plans for the listed areas mentioned in Regional Plan-2021 and should be incorporated in Sub-regional Plans and tourism policy. • Tourist circuits should be created at Sub-regional level and at regional level. • Should be a key element in land use policy. • The tourism departments while preparing the Tourism development Plans at sub-region/local level should also identify all monuments/ heritages and should prepare action plan for such areas. • Fiscal incentives/ subsidies etc. should be given to private entrepreneurs for management of various tourist sites. 	All NCR Cells, Archaeological Survey of India, State Archaeology/Tourism departments of concerned States and local authorities.

PROPOSED STAFF IN THE TECHNICAL WING OF NCR PLANNING BOARD

Posts	Sanctioned Strength	Proposed Strength	Additional Strength
Chief Regional Planner (Rs.18,300-22,000)	1	1	-
Additional Chief Regional Planner (Rs.16,400-20,000)	0	1	1
Joint Director (Technical) (Rs.12,000-16,500)	3	4	1
Deputy Director (Technical) (Rs.10,000-15,200)	2	8	6
Assistant Director (Technical) (Rs.8,000-13,500)	5	16	11
Planning Assistant (Rs.5,500-9,000)	1	4	3
Draughtsman (Grade III)/Technical Assistant (Rs.4,000-6,000)	1	2	1