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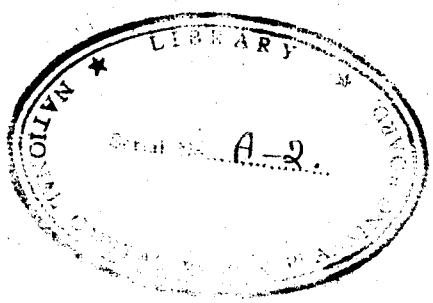
STATEMENT OF SURVEY AND SUMMARY OF FINDINGS

STUDY ON ECOLOGY & ENVIRONMENT OF THE NATIONAL CAPITAL REGION



for
THE NATIONAL CAPITAL REGION PLANNING BOARD
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STUDY OF ENVIRONMENT AND ECOLOGY : NCR

SURVEY AND SUMMARY OF FINDINGS

1.0 ENVIRONMENTAL & NATURAL RESOURCES:

1.1 Physiography:

National Capital Region has two distinct physiographic units:

(i) The Ganga-Yamuna Plains
(ii) The Aravalli range.

1.1.1. The Ganga-Yamuna plains:

The watershed of Ganga covers almost the entire northern India including Yamuna basin. A clear watershed line divides the area between Ganga basin and Yamuna basin within the NCR. Major portion of NCR falls in the Yamuna basin and only a small portion of NCR drains directly into Ganga.

The characteristics of soils have been obtained from NBSS & LUP/AISS & LUP, CGWB/Census of India/Agricultural University, Hissar etc.

Although there are local variations, the soil generally consists of alluvium deposits, ideal for cultivation, except in the Aravalli and the Sahibi catchment. The area can be further subdivided into (i) Trans Yamuna area (ii) Ganga Yamuna Doab and (iii) Sahibi Catchment.

1.1.1.1. Trans Yamuna area: The region is charaterised by thick unconsolidated material sloping at a very gentle gradient from west towards Yamuna. Soil generally consists of Yamuna alluvium. The older alluvium plains have low fertility, with low moisture retaining capacity and are found in certain parts of western Haryana. The older aluvium plains of lowlands on the other hand have medium fertility status. The ground water basins follow more or less the natural contours.

1.1.1.2. Ganga-Yamuna Doab - The entire area consists of alluvial soil of high fertility. Almost 90% of the area is covered under this soil, although there are pockets of clayey nodules which are poor in nutrients and require considerable amount of chemical fertilizer input. The ground water follows the natural contours, and varies in depth from 2m to 6m on the average.

1.1.1.3. Sahibi Catchment - The soils are sandy to coarse loamy, of low fertility status & soil erosion in a major problem.

1.1.2 Ground Water:

Ground Water data has been obtained from CGWB, reports of AISS & LUP, Census, CCA, CPCB etc.

Shallow aquifers hold ground water in unconfined state in the areas underlain by alluvium deposits. The deeper aquifers are confined in nature. In Sonepat and Panipat disticts the general yield in the range of 150 cu.m /hour. In the NCT of Delhi the aquifers are discontinuous in nature and wells yield about 30-100 cu.m /hr. In the area along Sahibi Catchment and in the Rewari Distict, the average yield is 50-100 cu.m /hour. But in the areas characterised by weathered residue and fractured zone (Aravalli area) the yield is in the range of 5-20 cub.m /hour, with appreciable draw downs.

Quality of water varies within the NCR-particularly critical areas are located in Sonepat disticts, western parts of Rohtak district, north western & southern portion of Gurgaon district, parts of Rewari district, northern parts of Faridabad district, north western and south western parts of NCT of Delhi and in the north eastern part of Sahibi river basin where the ground water is saline. In majority of Haryana sub region fresh water overlies saline water, upto a depth of 50-60 m, which imposes restriction on withdrawal.

1.2 Bio-diversity

Vegetation is a major constituent of bio-diversity - as well as fauna of various kinds. In order to meaningfully appreciate its role in the area of spatial planning - the NCR has been broadly classified into - (i) River Systems - Ganga, Yamuna, Hindon, Sahibi, (ii) Hills of Aravallis, (iii) Special protected areas - National parks & Sanctuaries, (iv) Forested area, (v) Agricultural areas (vi) Habitations.

1.2.1. River Systems:

While Yamuna is highly polluted in Delhi (CPCB/Yamuna Action Plan), Ganga has been provided substantial relief through the Ganga Action Plan (GPD/CPCB/State Pollution Control Board). Water quality data reveal no serious problem to the biota. The biodiversity of Benthos (WWF) reveal rich variation. The data regarding water quality, the level of chemical composition for tolerance levels reveal (Min. of Agriculture) that the water quality levels are on the whole within manageable limits. However, pockets of areas cause concern.

1.2.2. Hilly areas:

Study of flora and fauna of the Aravallis indicate (Kalpvriksha, Sristhi, WWF) that pollution and effect of urbanisation has made serious impact on the bio-diversity. Species changes are taking place due to introduction of exotic species. Also some developers have started speculative development which may have serious impact.

1.2.3. Special Protected areas:

There are three protected areas, viz. Sultanpur National Park, (WWF) Jamuna River Wetland, Sariska National Park. Sultanpur is affected by urban development in the vicinity and Jamuna bed is badly affected by pollution (CPCB).

(iv) Forests.

NCR has very poor forest cover. Apart from the forested areas of Aravallis, there are few more areas under forest, such as, near Behror along NH8 at Hastinapur, and at a few places north of Hindon (Forest Dept) Information on diversity has been obtained (Horticulture Dept, DMP etc).

(v) Agricultural areas:

Major portion of NCR is under agricultural land use. A large variety of crops grow in this region. District wise data on cereals, pulses, spices, fruits, vegetables are available (D S & E & Min. of Agriculture, State Dept. of Agriculture). Use of fertilisers and pesticides for different areas are available.

(vi) Habitations:

Although a very small part of NCR is covered under habitations of human kind the impact is very great. Apart from human beings a significant population of livestock constitutes the biological variety (ICAR, Min. of Agriculture etc).

1.3 Climate:

The climate of NCR does not exhibit significant spatial variation. Data regarding (i) rainfall (ii) temperature (iii) humidity (iv) cloudiness (v) wind direction and speed and (vi) special weather phenomenon has been obtained from the six meteorological stations within NCR.

Comparison of temperature data reveal that there is distinct seasonal variations, also diurnal variation is high in both winter and summer. On the other hand there is significant variation in rainfall between areas as well as between years. Rohtak and Rewari districts are drought prone. There is no marked variation in humidity and cloudiness in the region. Except at Rewari, Alwar, the wind direction and speed is more or less similar in the NCR, which is North and North west. A significant climatic phenomenon is the dust storms, which generally is caused by westerly disturbances. This data is valuable for location of Industries.

2.0 ENVIRONMENTAL STATUS:

The status of the environment is established through the understanding of the resources and their rate of degradation.

2.1 Land:

From the study of data available from NBSS LUP/CPCB/Survey of India, degraded land is observed in north and north west Panipat, Sahibi Catchment, near Western Jamuna Canal in between Gonaur and Gohand, the Aravallis, Ferozpur - Tijara, near Khurja, near Dankaur. Degraded land is also observed along Yamuna river bed. In many towns the nearby land has been used for brick making. Quarrying on the Aravallis has resulted in serious degradation. However, majority of stone crushers - in Haryana have been closed down and shifted.

2.2 Water:

Water quality data is collected by CPCB, as well as State Pollution Control Boards. In addition individual industries - identified by PCB's have to submit data.

The water of river Yamuna is abstracted at different points for various uses, and the main river has a poor flow (Yamuna Action Plan, CPCB). Similarly water of Ganga is abstructed at various points (CGA). Since Ganga has only three urban settlements within NCR on its banks, it does not receive much of industrial pollution. Also only a small portion of NCR drains into Ganga. Yamuna on the other hand has become the main receptacle for pollutant discharge, and the alarming level of pollution is revealed by the water quality data as it travels down NCR. Hindon on the other hand is mainly used by U.P. Irrigation Department. But it receives discharge from industries from Shaharanpur downstream. At Ghaziabad it becomes severely polluted.

2.3 Air:

Air data is monitored by CPCB, as well as by State Pollution Control Board. Industries have been classified according to typology. Discharge levels from selected industries are monitored by State Pollution Control Boards and there are six Headquarters within NCR from whom air quality data has been obtained. Air pollution level is well beyond the permissible limits in the NCT of Delhi. There are several industrial pockets, such as Ghaziabad, Sikandrabad, Khurja, Panipat, Gurgaon, Faridabad, Alwar which are also polluted. Interestingly NOIDA which has a high concentration of industries is not polluted due to efficient choice of industries as well as installation of pollution control equipment.

2.4 Noise:

Excepting in major urban corridors with heavy volume of vehicular traffic and closely built up places noise level is generally within permissible limits. However, the Indira Gandhi International airport affects a substantial part of Southern and western Delhi by high decibel noise. No information can be made available of aircraft movement out of Hindon Air Force Base. However, majority of flight path is away from human habitation and due to smallness of the size of aircraft and rapid descent and climb, the spread area is restricted.

2.5 Built Environment:

A survey of Class I, II and towns of NCR have been done. There are a number of historic settlements within NCR which require Heritage Conservation. Tentatively these have been identified as Kishangarh, Badshahpur, Alwar, Ferozpur, Sohna, Anupshahr, Garhmukteswar, Pataudi, Sikarpur, Chattari, Parikshitgarh, Panipat. Khurja deserves a special conservation action as it represents a tradition in pottery making. The historic core of all these towns are detoriating due to unplanned development.

The layout of majority of towns is characterised by poor and narrow layout of road, poor confirmity to building bye-laws, lack of infrastructure facilities. Predominantly single storeyed with 30 to 40% two storeyed buildings. Poor garbage collection and lack of environmental health infrastructure are major causes of environmenal degradation.

2.6 Hazardous Activities:

Narora Atomic Power Plant obviously is a hazardous industry in NCR. In addition, polluting industries, particularly those using dangerous chemicals present hazard. List of such industries and their locations hve been obtained. Heavy traffic routes, and unprotected railway tracks also present hazard. However, in majority of Haryana towns, the town has been provided with a bye-pass route.

3.0 Major Developmental Activities (on going)

Developmental Actvities are taking place in various sectors. Major among them are, (i) Transport Infrastructure, (ii) Industries, (iii) Urban Development (iv) Infrastructural Improvement and others (v) Energy Infrastructure.

3.1 Transport:

Transport in NCR can be divided into 3 major sectors, (i) railways (ii) Roads, (iv) Airways.

3.1.1. Railways:

The most major programme under implementation by the Indian Railways is the Mathura-Alwar bye-pass line - which will substantially relieve Delhi area from through freight traffic. The Delhi-Ambala electrification will have a major impact on increased passenger capacity in the corridor. The Delhi Rewari - Gauge conversion from metre to broad is a major development input. The proposed terminal and goods yard at Biwasan is under consideration. The peripheral terminals around Delhi to provide extra line capacity are under active consideration. The container Terminal at Tughlakabad is under operation.

3.1.2 Roads:

Highway improvements are underway on the Sonepat-Panipat Road (NH1), as well as Panipat-Rohtak including flyover over the railways. Similarly a major north south corridor is being developed between Alwar-Kishangarh-Bhiwadi-taking advantage of which new industries are already coming up. Improvement programme is also going on Delhi - Agra Highway, Bulandshahr-Hapur. Ghaziabad-Hapur, Surajkhund-Faridabad.

3.1.3 Airways:

No new airport proposal could be obtained.

3.2 Industry:

Major industrial development activity is going on in the second phase of NOIDA, Sikandarabad, South of Sohna, Ferozpur, Alwar, Jahangirabad, Dadri, Gajraula, Kundli, Daurala, Mawana, Khurja, Faridabad-Ballabhgarh, Simboli. Industrial estate by private enterpreneurs are coming up in Dharuhera-Bhewadi area. Stone quarring industries have suffered a setback due to Ministry of Environment order in the Aravalli.

3.3. Urban Development:

Urban Development is generally being undertaken by HUDA, in Haryana. Alwar Urban Development Authority, and respective Development Authorities of Meerut, Ghaziabad, Bulandshahr - Khurja, NOIDA. The development plans of these authorities provide development scenario upto 2001. However, uncontrolled and unplanned development is taking place in all other Urban settlements.

3.4 Infrastructure and others.

Wholesale mandi and warehouses is under construction in Bulandshahr. Yamuna Canal extension programme for Gurgaon is underway. Improvement of water supply in Anup Shahr and sewerage scheme in Hapur is underway. The Development Plan for urban areas drawn up by various development authorities and State town Planning departments provide indications of future infrastruture development.

3.5 Energy:

Delivery of energy constitutes one of the major infrastructure facilities, and is of particular concern because the process of generation and its use is polluting.

3.5.1 Electricity:

There are eight thermal power plants in NCR, Delhi has three coal based and one gas based plant. Haryana sub-region has 2 and UP sub region has two. There is Narora Atomic Power Plant. In addition NCR is able to draw power supplied to northern grid from Singrauli, Rihand, Unchahar, Dadri, as well as from Bhakra. Data regarding capacity, generation and fuel consumption have been obtained. Analysis of consumption pattern reveal that domestic consumption of Delhi is between 1.5 to 2 times more than other parts of NCR (CEA/NTPC/NREB).

3.5.2 LPG:

Study reveals that all class I cities have LPG outlets, but outlets are fewer in other classes of cities. Haryana is slightly better off than UP. But on the whole majority of Urban household do not have access to LPG (IOL-BPL-HP).

3.5.3 Oil (Petrol & Diesel)

Data has been gathered from different companies (IOC-BPL-HP-IBP-OCC). 45% of cities in UP sub-region do not have outlets. The situation in Haryana is slightly better. Here again the consumption rate in Delhi exceeds that of all other places by a large margin.

3.5.4 Kerosene:

The consumption of Delhi exceeds that of Haryana although mainly used in domestic sector.

3.5.5. Coal:

Coal is generally supplied to power station and industries. Stationwise offloading data as well as those supplied to select consumers are available.

4.0 Urban Centres:

4.1 Population:

The population and distribution has been studied from Census of India 1991. Majority of the Urban pop (73.1%) live in the DMA Town, 14,53% in priority towns. Among the priority towns Meerut has the highest population. The growth between 1981-91 shows that DMA towns grew by 64.72%, priority towns by 45.78%. The growth trends of all the urban areas reveal a bias towards larger size classes, which need to be examined against resource base for further expansion.

4.2 Economic activity:

According to Census of India 1991, the NCR consists of a total working population of 79,88,287 persons. The workforce participation rate during in 1991 was 30.31% against 28.69% in 1981. However, Urban participation rate has declined from 30.38% in 1981 to 30.23% in 1991. Subregion wise NCT of Delhi has 34.53%, Rajasthan 28.96%, Haryana 28.35% and U.P. 27.5%, participation rate. In urban areas major proportion of workforce is engaged in tertiary sector (68.65%).

4.3 Linkages:

Except in DMA towns, other towns in NCR act as nodal centres for the rural catchment, as mandi, tractor & implement repair, shopping facilities, energy supplies etc. The rural road infrastructure on the whole exists, although poor in maintenance and construction.

4.4 Functions:

The sectoral classification of workforce indicates the function of the town. For example high industrial workforce is observed in Bhiwadi (76.35%), Dhruhera (59.23%), Panipat (39.74%), indicating industrial dominance. Whereas Rohtak (15.03%), Bulandshahr (18.48%) and Hapur (19.56%) reveal dominance of tertiary sector indicating centrality to rural catchment.

MASTER PLANS:

Master plans are available only for a few urban centres out of the 108 urban areas in NCR and all of them have a horizon year of 2001, which is not a very helpful guide for 2011.

Therefore an analysis is being undertaken to understand the rate of land resource concumption due to growth. Studies indicate that in 1961 the average size of urban area in NCR (minus NCT of Delhi) was 6.6 sq.kms, which increased to 7.8 sq.km in 1971, and 9.6 sq.km in 1981. Unfortunately from the Census of 1991 this data is not available as yet. There is significant variation regionwise. Study also indicates that whereas the gross density of population in Class I towns is approximately 100 ppha, the density progressively goes down the size classes. The density for Class V towns is 10 ppha. This would be a significant factor in determining urban expansion, as far as land resource is concerned.

5. Transport:

The data has been collected and collated for (a) Classified Traffic volume on all major regional network roads, (b) traffic volume of major roads of DMA towns & (c) Traffic volume at cordon points NCT Delhi.

5.1 Network:

The network has been divided into (i) road network, (ii) rail network and characteristics of volume of traffic in pasengers and goods examined. The major urban centres of NCR, other than NCT of Delhi, have been examined for the network, and delay factor in traversing the town. It is observed that for majority of towns in NCR the towns have been provided with a bye-pass. However, poor development control results in unintended development. The road network of NCR consits of 9 radial corridors, of which five are National Highway. There are severl orbitals which connect the major urban centres. The railway network is basically radial, with the epicentre in Delhi. However, railways are planning decentralisation.

5.2 Capacity:

Major roads are of 4 lane carriageway, part of which are divided carriageway. The secondary network consists largely of 2 lane carriageway. Thye surface quality varies, but generally classed as fair to poor. Ribbon development, particularly in the corridor of Delhi-Ghaziabad-Modinagar-Modipuram-Meerut, Delhi-Hapur-Bulandshahr create capacity constraints. Railways capacity, despite the eight corridors is restricted (RITES). Some plans are on to increase capacity.

5.3 Volume:

The volume of road traffic is growing steadily. The growth rates observed around Delhi, DMA and priority towns varied from 3.2% to 13.7%. The trend shows an average growth rate of 5% p.a. However, data show considerable variation among corridors. Delhi-Ghaziabad corridor is the most heavily loaded.

5.4 Speed:

The speed of traffic in open country stretches and through the towns are considerably different. Surveys have been conducted in 33 urban centres of NCR. The average speed in open country could be maintained between 35-40 kmph, despite unrestricted crossings. However, the speed through urban centres varied between 10-15 km/hr. Although this would also vary according to the day of week.

CONCLUSION:

The data base provides interesting points for analysis. For example the historic heritage of built environment calls for careful scrutiny and these could provide as valuable economic assets from tourism point of view while conserving heritage. Also number of settlements are located in ecologically fragile areas, such as Sohna, Ferozpur, Nuh, Alwar, Anupshahr, Garhmukteswar etc, which should receive a different planning approach. In areas on the Aravalli, the natural resources need to be protected from urban encroachments. The vast ecological resources of the river systems need a considered approach, both for protection as well as use of the amenity value. The data on environmental pollution is alarming, but fortunately localised and it appears amenable to control mechanisms.

The population scenario is necessary for further analysis. This would have to be finalised by the NCR Planning Board, and then it would be easier for us to analyse the impact from environmental point of view and for sustainability of development.

ASPECT OF STUDY: ENVIRONMENTAL AND NATURAL RESOURCES

DATA COLLECTED	DATA SOURCES
1. Land (Physiography, Soil, Drainage)	N.B.S.S & L.U.P A.I.S.S & L.U.P C.G.W.B. Census of India Agricultural University (Hissar)
2. Water (Surface & Ground Water)	C.G.W.B. C.P.C.B. G.P.D. S.P.C.B's Ministry of Agriculture Dept. of Irrigation
3. Vegetation (Forests, Green Areas)	Census of India D.S & E Ministry of Agriculture State Dept. of Agriculture I.C.A.R. State Forest Conservation Department
4. Bio Diversity	W.W.F. Srishti Kalpavriksh Horticultural Department
5. Climate	I.M.D.

STATUS - SATISFACTORY

ASPECT OF STUDY: ENVIRONMENTAL STATUS

DATA COLLECTED	DATA SOURCES
1. Land	N.B.S.S & L.U.P A.I.S.S & L.U.P S.O.I. N.W.D.B.
2. Water	C.P.C.B S.P.C.B's C.G.A. U.P. Irrigation Dept. G.P.D C.W.C.
3. Air	C.P.C.B S.P.C.B's
4. Noise	Reconnaisance Survey T.E.R.I Report
5. Built Environment	Reconnaisance Survey
6. Hazardous Activities	Reconnaisance Survey C.P.C.B. S.P.C.B's

STATUS - SATISFACTORY

ASPECT OF STUDY: MAJOR DEVELOPMENTAL ACTIVITIES

DATA COLLECTED	DATA SOURCE
1. Industry	C.P.C.B. S.P.C.B's S.I.D.C. N.I.D.C. Reconnaisance Survey
2. Markets	Reconnaisance Survey
3. Transport	Indian Railways RITES O.R.G. C.R.R.I. S.R.T.C's
4. Energy & Power Projects	C.E.A. N.T.P.C. N.R.E.B. I.O.L., B.P.L., H.P.C.L., O.C.C.

S T A T U S - SATISFACTORY

ASPECT OF STUDY: URBAN CENTRES

DATA COLLECTED	DATA SOURCES
1. Demography & Population Growth	Census of India
2. Major Economic Activity Linkages, Functions:	Census of India Master Plans
3. Master Plans:	State Town Planning Authority.

S T A T U S - SATISFACTORY

ASPECT OF STUDY: TRANSPORT

DATA COLLECTED	DATA SOURCES
1. Network Inventory	Indian Railways C.R.R.I.
2. Capacity Utilisation	T.E.R.I R.I.T.E.S
3. Volume	O.R.G. S.R.T.C's
4. Speed/Delay	Reconnaisance Survey

S T A T U S: SATISFACTORY