Chapter 2

Geographical Profile of Study Area
CHAPTER – 2
GEOGRAPHICAL PROFILE OF THE STUDY AREA

2.1 Introduction

Delhi is a historical city. Many a times, it was destroyed by invaders and many a times, it was re-built and re-christened with a new magnificence. Delhi was developed at various sites during different times by several kings, sultans and emperors. The imprints of which can be seen on its internal physical structure, space relations, social configurations, values and ethos. It is a unique city with a blend of the ancient and the modern. It has survived the passage of time to become a bustling metropolis with nearly 17 million inhabitants. Being the capital of largest democracy and prime metropolis of India, it is gaining importance among the leading metropolitan cities of world. Presently, Delhi is one of the most important hubs of trade, commerce and hospitality. Its deep rooted traditions, fast growing population, expanding administrative and economic functions in the global economics make the city distinctive. It is major centre of income and wealth with the highest per capita income (1,75,812 rupees in 2011-12, at current prices) amongst the states and union territories of India and a number of other forces that the city epitomizes historically, physically and socio-economically.

Today’s Delhi after evolving through various successions, represent a typical society. It represents a true metropolitan character with people from all regions and religions of India and abroad. Being a large metropolitan city, it faces a number of urban problems such as pollution, congestion, receding groundwater table, unhygienic life styles and poor infrastructure at some parts, traffic snarls and above all encroachment upon rural belt (green belt). Slums are on a rise where there is apparent problem of water supply, waste disposal, housing, electricity, health, drainage, transportation and congestion.

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The city of Delhi lives across the river Yamuna with most of its land falling towards its west. To the south west lies the Thar Desert which has been little inhospitable to permit easy passage. To the north, not very far off, are lofty Himalayas. On the north-west exists plain area and immediately to the south, is the Aravali range, while in the east lies the fertile Ganga plains. Delhi, thus, forms a gateway between the Thar Desert, the Aravalies and the Himalayas. This commanding position of the city, especially the confluence point of mountains, plains and plateaus has offered it a strategic importance whereas the raised plateau on west of the river Yamuna has given an ideal location free of floods. These features have together provided Delhi a climate suitable for large urban concentrations.\(^1\)

### 2.2 Physical Profile

#### 2.2.1 Site of Delhi

The National Capital Territory of Delhi, comprising of nine districts with an area of 1483 square kilometers, is situated between the Himalayas and Aravalies in the heart of the Indian Subcontinent. It lies between 28°24’17” and 28°5’00” north latitudes and 76°50’24” to 77°20’37” east longitudes. In size it ranks 27\(^{th}\) amongst all the states and union territories. It is surrounded from three sides by Haryana and to the east across the river Yamuna by Uttar Pradesh. It occupies the central geographical location as it is 1,542 kilometers far from Mumbai, 1,536 kilometers from Kolkata and 1,700 kilometers from Bhubaneswar. The major part of the territory lies on the western side of Yamuna, only some villages and urban areas of Shahadra lie on the eastern side of the river. Its greatest length is around 52.8 kilometers and the greatest breadth is 48.48 kilometer. Delhi’s altitude ranges between 213 and 305 meters above sea level. The general slope of the land is from north to south. The geographical location of Delhi is being influenced to its growth and development as well as socio-economic and cultural environment. (Figure 2.1).

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Figure 2.1: Delhi: Location of Study Area

Source: Census of India, 2011.
2.2.2 Topography and Relief

Delhi is situated in the Indo-Ganges plains which occupies a nodal position in the subcontinent of India. This vast riverine plains, narrow down in the sector between the Thar Aravali barriers, projecting itself from the southwest and the Himalayan outliers thrusting themselves from the north, thus, giving this area the character of a broad alluvial neck. Physiographically, it can be divided into five types of terrain as discussed below:

2.2.2. (a) Hill Relief: The most crucial feature of the area is the ridge. This relief feature is almost triangular in shape with a wide base in the south and a very narrow apex in the north. The ridge of Delhi is the culminating spur of Mewat branch of the Arawalli hills and enters the Delhi from south extending up to Yamuna River in the north direction. The northern most tip of the ridge is visible up to Wazirabad. Although the ridge is not continuously open now-a-days as much of it has been covered by buildup area of the city. The tail end of the last spur of the ridge goes southwards up to Mehrauli and then turns towards Badarpur and Tughlakabad along the Delhi-Haryana border. The relief has its maximum altitude of 318 meters at Bhati in the south and lowest 208 meters above sea level in the north at Wazirabad. The point near Bhati has a height of 1,045 feet. Tughlakabad fort is located on one of the highest spurs of the ridge. This ridge has a maximum width of 2.5 kilometers in west of Chankyapuri and minimum width of 50-100 meters at Wazirabad. (Figure 2.2).

2.2.2. (b) Bad Land: Lying in the vicinity of the rocky relief, it stretches from present day Anand Parbat to Harchandpur. The rocky area, which is highly jointed resulted in percolation of rain water and give rise to a fine textured dendritic pattern drainage leading to the formation of these bad lands. The entire zone is an area of intense soil erosion.

2.2.2. (c) Undulating Surface: Streams coming out of the bad land flow over a gently undulating surface. This surface which is separated by riverine and a stretch of about 3 meters from the Yamuna flood plains, as observed at Wazirabad Barrage on east of Badarpur has centripetal drainage systems in its western and southern parts through the Mangeshpur, Nangloi, Sahibi and Palam drains.
Figure 2.2: Delhi: Relief

Source: Census of India, 2011.
2.2.2. (d) **Najafgarh Drains:** The only escape from the depression of undulating surface is the Najafgarh drains which flows in a north-east direction and joins the Yamuna River near Wazirabad. The course of this link channel has two main stretches with a combined capacity of 3000 cusecs for drainage. However, this proves inadequate during heavy rains causing spillage and flooding.

2.2.2. (e) **Flood plains of Yamuna:** The second important land feature of Delhi is the flood plain of Yamuna. This comprises of an area of 161 square kilometers extending up to a maximum length of 14 kilometers from the river in the north. The meanders of the river Yamuna, through centuries, have left their deep impression upon the physiography of this plain. With an average height of about 700 feet (215 meters) above sea level, the Yamuna plain is considerable wide, fertile and populous in the north but towards the south they are almost lost in the maze of rocky undulations. Further south, the terrain becomes more flat. This plain can be sub divided into three separate sub-relief units: Khadar, Bangar and Dobar.

**Khadar:** The area of recent deposits by the river is called Khadar or new alluvium. The area is flooded during the monsoon season.

**Bangar:** The area of old alluvium or old deposition called Bangar and has undergone a similar process of formation as the Khadar.

**Dobar:** Dobar is low lying and rain fed area situated to the west of the hilly terrain. During the year of good rainfall an area of more than 50 square kilometers gets flooded. Even during the winter season, the main depression (Najafgarh Jheel) occupies an area of about 12 square kilometers. The Dobar zone has some other minor depressions too.

The level plain of Bangar lies to the north of the ridge. The low basin area situated to the west of the hills is of the Dobar soils. It includes Najafgarh and Kakrola areas. The new Khaddar lies along the banks of River Yamuna, while the old khaddar is in the west of new Khaddar. The southern part adjacent to Mehrauli and Tughlakabad is called Kohi. (Figure 2.3).
Figure 2.3: Delhi: Physiographic Divisions

Source: Census of India, 2011.
2.2.3 Drainage System

The direction of the flow of river Yamuna from north to south follows the direction of the general slope of the area. A local watershed, west of the river Yamuna divides the drainage system of the area into two parts: (i) eastern and (ii) western. The eastern portion drains itself into the river Yamuna, while the water from the western part flows into a large depression in the Dobar region, the Najafgarh Jheel that is eventually drained by the Najafgarh Drain into Yamuna itself. The river Yamuna forms a major part of the eastern boundary between the area of the study and the state of Uttar Pradesh. The river enters the NCT of Delhi about one and a half kilometers north of the Palla village, at an altitude of about 212 meters and leaves it at a point south of Okhla, at an altitude of about 200 meters, travelling the NCT of Delhi for about 32 kilometers. In rainy season, the river widens considerably and threatens vast areas in the northwest and east when inundated\(^1\).

In the northern parts of the study area, the western Yamuna Canal, flowing over the crest of watershed, forms the main dividing line between the two drainage systems. To the west, main outlet is provided by Mugeshpur Drain, which rises in Haryana state close to the boundary of Delhi. After flowing through the neighboring areas of Haryana, the drain reappears in the NCT of Delhi and flows eastwards\(^2\). The area lying to the east of the Western Yamuna canal is drained by Drain No. 6 originating in Haryana and entering the NCT of Delhi near Narela. This drain joins Bawana escape near village Qadipur. The Bawana escape takes off from the Western Yamuna Canal and picking up the Drain no. 6 and Wazirabad Drain, joins the Yamuna near Jagatpur village. The most important drainage channel, lying wholly within the study area is the Najafgarh Drain. Originally the drain was cut out from the Najafgarh Jheel in 1838 to provide an outlet for the surplus water from the huge Dobar depression into the Yamuna. Flowing through several villages and draining the urban areas of Delhi in its lower reaches, the Drain joins the Yamuna at Wazirabad (Figure 2.4).

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\(^2\) District Census Hand Book (1961), Delhi.
Figure 2.4: Delhi: Drainage

Source: Census of India, 2011.
2.2.4 Geology

The rocks of Delhi belong to the earliest and latest eras of the geological history of the earth i.e. the Pre-Cambrian and the Quaternary periods. The intervening records are missing here, as the region has been lying exposed to sub-aerial erosion since it rose from beneath the sea in late pre Cambrian times referred to as belonging to the Alwar series of the Delhi system in the nomenclature of Indian geology. The Alwar series of rocks occur in small hills, ridges and plateaus which are probably vestiges of a major folded structure. They are unconformable overlain and surrounded by the alluvial and windblown sand of the Quaternary period. The Quaternary deposits cover all the plains occupying over three-fourth of the area of Delhi. The Delhi system is of lower and depth age is endowed with excellent building materials such as red sandstone. It is composed of ferruginous and lime quartzite schistose in trended by large.

2.2.5 Geohydrology

Delhi area can be divided into four zones based on the groundwater regime. Zone-I located along northwest of the Yamuna river consist of alluvial plain having fairly thick and regionally extensive confined/unconfined aquifers down to 300 meters depth and Zone-II is confined to eastern side of river Yamuna and is of alluvial nature with moderately thick and regionally extensive confined/unconfined aquifers down to 150 meters. Zone -III is confined to the western side of river and consist of alluvial plain having fairly thick and discontinuous aquifers. Zone-IV occurs mainly in the central to southern part of Delhi region and consists of rocky terrain with groundwater restricted to weathered residuum.

2.2.6 Soil

There are four main geographical regions of Delhi on the basis of the distribution of soils. In north-west calcareous, salty clay loam is found. In south western parts and in north-eastern parts the mixed, calcareous, salty, clay and sandy loam is found. The sandy loam soil found in south-west, is deficient in nitrogen elements and also has a

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high salinity contents; therefore, this soil is not very good for cultivation. The course to fine loamy soil is found in north-east; mostly along the river Yamuna is good for growing crops and vegetables. Sand, silt and calcareous (coarse loamy) soils are found around Chattarpur, Bijwasan and Rajokri etc. These areas have very low water level and are good for cultivation of vegetables. The rocky Aravali ridge and dissected land are found in southern parts of Mehrauli Tehsil. Various types of soil erosion exist in this area and hence it is not good for cultivation. Various types of stones found in this area are widely used for construction purpose (Figure 2.5).

2.2.7 Climate

The region has a tropical steppe climate. It is characterized by a unique semi-arid climate with extremes of summers and winters. Monthly mean temperature ranges from 14.3°C in January (minimum 3°C) to 34.5°C in month of June (maximum 47°C). The annual mean temperature is 25.3°C. There are two meteorological stations in Delhi for recording temperature, namely (i) Palam and (ii) Safdarjung. These stations provide continuous data on rainfall and temperature. The following table shows normal monthly maximum and minimum temperature in degree Celsius of Palam meteorological station in the NCT of Delhi. (Table 2.1).

Table 2.1: Delhi: Mean Monthly Maximum and Minimum Temperature (°C) (2009-2012)

<table>
<thead>
<tr>
<th>Month</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
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<tr>
<td></td>
<td>Mean max</td>
<td>Mean min</td>
<td>Mean max</td>
<td>Mean min</td>
</tr>
<tr>
<td>Jan</td>
<td>21.7</td>
<td>8.9</td>
<td>19.0</td>
<td>8.3</td>
</tr>
<tr>
<td>Feb</td>
<td>26.1</td>
<td>11.2</td>
<td>25.3</td>
<td>11.6</td>
</tr>
<tr>
<td>March</td>
<td>31.4</td>
<td>16.0</td>
<td>33.8</td>
<td>18.6</td>
</tr>
<tr>
<td>April</td>
<td>36.9</td>
<td>22.2</td>
<td>40.3</td>
<td>24.8</td>
</tr>
<tr>
<td>May</td>
<td>40.1</td>
<td>25.9</td>
<td>41.5</td>
<td>27.8</td>
</tr>
<tr>
<td>June</td>
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<td>July</td>
<td>36.9</td>
<td>28.3</td>
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<td>Aug</td>
<td>35.4</td>
<td>27.2</td>
<td>33.6</td>
<td>26.7</td>
</tr>
<tr>
<td>Sep</td>
<td>34.1</td>
<td>25.1</td>
<td>31.0</td>
<td>24.6</td>
</tr>
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<td>Oct</td>
<td>32.9</td>
<td>19.2</td>
<td>32.9</td>
<td>21.1</td>
</tr>
<tr>
<td>Nov</td>
<td>27.2</td>
<td>13.4</td>
<td>27.4</td>
<td>15.4</td>
</tr>
<tr>
<td>Dec</td>
<td>23.6</td>
<td>8.6</td>
<td>22.3</td>
<td>7.8</td>
</tr>
</tbody>
</table>

Source: Compiled by researcher from India Metrological Department, New Delhi.
Figure 2.5: Delhi: Soil Types

Source: Census of India, 2011.
The main seasonal climatic influence is the monsoon, typically from June to October. The year can be broadly divided into four seasons. The winter season starts in late November and extends to the beginning of March. This is followed by the summer season that lasts about the end of June or mid-July until the monsoon arrives which continues till September. The two post monsoon months i.e. October and November constitute a transition period from monsoon to winter. Maximum rain fall occurs in the month of July (211mm). The heavy rains of monsoon act as a ‘scrubber’. North easterly winds usually prevail, however in June and July south-easterly predominates. (Table 2.2 and Figure 2.6).

Table 2.2: Delhi: Total Monthly Rainfall (mm) (2009-2012)

<table>
<thead>
<tr>
<th>Month</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
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<td>Jan</td>
<td>5.8</td>
<td>6.2</td>
<td>0.5</td>
<td>13.9</td>
</tr>
<tr>
<td>Feb</td>
<td>4.7</td>
<td>30.1</td>
<td>53.7</td>
<td>1.6</td>
</tr>
<tr>
<td>March</td>
<td>9.6</td>
<td>0.0</td>
<td>3.8</td>
<td>6.2</td>
</tr>
<tr>
<td>April</td>
<td>3.2</td>
<td>0.2</td>
<td>8.7</td>
<td>18.3</td>
</tr>
<tr>
<td>May</td>
<td>65.8</td>
<td>5.4</td>
<td>24.8</td>
<td>3.2</td>
</tr>
<tr>
<td>June</td>
<td>19.0</td>
<td>3.9</td>
<td>88.3</td>
<td>15.5</td>
</tr>
<tr>
<td>July</td>
<td>161.2</td>
<td>239.6</td>
<td>111.6</td>
<td>94.8</td>
</tr>
<tr>
<td>August</td>
<td>216.6</td>
<td>455.1</td>
<td>190.3</td>
<td>378.8</td>
</tr>
<tr>
<td>Sept</td>
<td>191.1</td>
<td>329.3</td>
<td>225.8</td>
<td>54.8</td>
</tr>
<tr>
<td>Oct</td>
<td>5.4</td>
<td>0.0</td>
<td>0.0</td>
<td>8.1</td>
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<td>Nov</td>
<td>10.4</td>
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<tr>
<td>Dec</td>
<td>2.8</td>
<td>3.5</td>
<td>0.6</td>
<td>2.3</td>
</tr>
</tbody>
</table>

Figure 2.6: Delhi: Annual Rainfall

Source: Census of India, 2011.
The air over Delhi is dry during the larger part of the year. Humidity is high in the monsoon months. April and May are the driest months with relative humidity of about thirty per cent in the morning and less than twenty per cent in the afternoon. During the monsoon sky is cloudy; in the remaining part of the year sky is almost clear. The monsoon lasts for about three months from July to mid September. However, the number of rainy days is about 40 with the total rainfall of 714 mm. Winds are generally light during the post monsoon and winter months. They become powerful during the summer and monsoon months. The normal wind speed is 10-12 km/h during June-July and 3-4 km/h during November to January. (Table 2.3).

**Table 2.3: Delhi: Relative Humidity (%) (2009-2012)**

<table>
<thead>
<tr>
<th>Month</th>
<th>2009</th>
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<th>2011</th>
<th>2012</th>
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<tbody>
<tr>
<td>Jan</td>
<td>90</td>
<td>96</td>
<td>88</td>
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</tr>
<tr>
<td>Feb</td>
<td>85</td>
<td>86</td>
<td>89</td>
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</tr>
<tr>
<td>March</td>
<td>71</td>
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<td>April</td>
<td>72</td>
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<td>May</td>
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<td>June</td>
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<td>July</td>
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<td>Nov</td>
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<td>86</td>
<td>82</td>
<td>81</td>
</tr>
<tr>
<td>Dec</td>
<td>97</td>
<td>88</td>
<td>88</td>
<td>83</td>
</tr>
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</table>

2.3 Administrative Setup

Delhi has seen the rise and fall of many empires, which have left behind a plethora of monuments with the grandeur and glory of bygone ages. This is a city which traces its history to the Mahabharata, the great epic tale for the city of Inderprastha. The Delhi has been the seat of so many kingdoms and dynasties. The Mughals ruled Delhi in succession, starting from Qutab-ub-din to Khiljis and the Tughlaqs. The city of Delhi passed into the hands of the British in 1803 A.D. In 1911, the capital of British Empire was shifted from Calcutta to Delhi. After independence, a kind of autonomy was conferred on the capital, but, it largely remained a chief commissioner’s regime. In 1956, Delhi was converted into a Union Territory (UT), and gradually the chief commissioner was replaced by a Lieutenant-Governor. In 1991, the national capital territory act was passed by the parliament and a system of Diarchy was introduced under which the elected Government was given wide powers; except in the sphere of Law and order, which remained with the Central Government. The actual enforcement of the legislation came into effect in 1993.

Three statutory towns are continuing in Delhi since 1961 namely,

a. New Delhi Municipal Council (NDMC)
b. Delhi Cantonment Board (Delhi Cantt.)
c. Delhi Municipal Corporation (Urban)

Till 1991 Census, there were only two Tehsils viz. Delhi and Mehrauli in the unidistrict Union Territory of Delhi. As against this, for the Census 2011, there are nine districts and twenty seven Tehsils. (Table 2.4 and Figure 2.7).
Figure 2.7: Delhi: Administrative Divisions (2011)

Source: Census of India, 2011.
Table 2.4: Delhi: District wise Number of Census Towns and Villages (2011)

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>District</th>
<th>Tehsil</th>
<th>No. of Census Town in District</th>
<th>No. of Villages in District</th>
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<tr>
<td>1</td>
<td>North-West</td>
<td>i) Narela</td>
<td>33</td>
<td>52</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ii) Saraswati Vihar</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>iii) Model Town</td>
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<td></td>
</tr>
<tr>
<td>2</td>
<td>North</td>
<td>i) Civil Lines</td>
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<td>4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ii) Sadar Bazar</td>
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<td></td>
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<td></td>
<td></td>
<td>iii) Kotwali</td>
<td></td>
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<td>North-East</td>
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<td></td>
<td></td>
<td>ii) Shahadra</td>
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</tr>
<tr>
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<td></td>
<td>iii) Seema Puri</td>
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</tr>
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<td>i) Gandhi Nagar</td>
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<td></td>
<td></td>
<td>ii) Vivek Vihar</td>
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<tr>
<td></td>
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<td>iii) Preet Vihar</td>
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<td>i) Parliament Street</td>
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<td></td>
<td>ii) Connaught Place</td>
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<td>iii) Chanakyapuri</td>
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<td>ii) Pahar Ganj</td>
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<td></td>
<td>iii) Darya Ganj</td>
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<td>West</td>
<td>i) Punjabi Bagh</td>
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<td></td>
<td></td>
<td>ii) Patel Nagar</td>
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<td></td>
<td>iii) Rajouri Garden</td>
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<td>South-West</td>
<td>i) Najafgarh</td>
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<td>ii) Delhi Cantonment</td>
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<td>iii) Vasant Vihar</td>
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<tr>
<td></td>
<td></td>
<td>ii) Hauz Khas</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>iii) Kalkaji</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>9</td>
<td>27</td>
</tr>
</tbody>
</table>

Source: Census of India, 2011 (Delhi).

2.4 Area of NCTD

The total area of NCT of Delhi is 1483 square kilometers (0.04 per cent of total geographical area of India) and out of this Municipal Corporation of Delhi occupies an area of 1397.29 square kilometers (94.22 per cent) whereas New Delhi Municipal Council and Delhi Cantonment area possesses 42.74 square kilometers (2.88 per cent) and 42.97 square kilometers (2.90 per cent) respectively. (Figure 2.8).
Figure 2.8: Delhi: Area under Civic Agencies (2011)

Source: Census of India, 2011.
The rural-urban composition has undergone changes during different Census years. The physical area of urban Delhi increased which reduced the physical setting of rural Delhi. The rural Delhi was spread over the 1156.74 square kilometers (78 per cent) in 1961 and decreased to about 558.32 square kilometers (37.64 per cent) in 2001 and 369.35 square kilometers (24.9 per cent) in 2011, due to the urbanisation of villages. Rural areas of Delhi are divided in five community development block for development purpose. These are Alipur, Kanjhaewa, Nangloi, Najafgarh, Mehrauli and Shahadra. The urban area of Delhi is increasing. The total urban area of Delhi in 1961 was 326.26 square kilometers (22 per cent), which was increased to 924.68 square kilometers (62.35 per cent) in 2001 and subsequently 1113.65 square kilometers (75.09 per cent) in 2011. (Table 2.5 and Figure 2.9 and Figure 2.10).

Table 2.5: Delhi: Distribution of Rural and Urban Area (1961-2011)

<table>
<thead>
<tr>
<th>Year</th>
<th>Rural</th>
<th>Percentage</th>
<th>Urban</th>
</tr>
</thead>
<tbody>
<tr>
<td>1961</td>
<td>78</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>1971</td>
<td>69.94</td>
<td>30.06</td>
<td></td>
</tr>
<tr>
<td>1981</td>
<td>60</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>1991</td>
<td>53.7</td>
<td>46.3</td>
<td></td>
</tr>
<tr>
<td>2001</td>
<td>37.61</td>
<td>62.39</td>
<td></td>
</tr>
<tr>
<td>2011</td>
<td>24.9</td>
<td>75.1</td>
<td></td>
</tr>
</tbody>
</table>

Source: Census of India, 2011.

Figure 2.9: Delhi: Growth of Rural and Urban Area (1961-2011)

Source: Based on Table 2.5
Figure 2.10: Delhi: Urban Expansion (1961-2011)

Source: Census of India, 2011.
The number of villages has declined sharply in the last six decades from 357 in 1921 to 112 in 2011. During 1951 Census, total 341 villages were recorded which decreased to 165 in 2001 Census. From 1961 to 2011, 188 villages have engulfed into the urban areas. According to 2011 Census, total 112 villages were in Delhi out of which 105 were inhabited and 7 were inhabited. (Table 2.6 and Figure 2.11). Continuous urban sprawling is encroaching the rural area of Delhi and rural villages have become urban villages.

Table 2.6: Delhi: Number of Rural Villages (1921-2011)

<table>
<thead>
<tr>
<th>Census Year</th>
<th>Number of Villages</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Uninhabited</td>
<td>Inhabited</td>
<td>Total</td>
</tr>
<tr>
<td>1921</td>
<td>43</td>
<td>314</td>
<td>357</td>
<td></td>
</tr>
<tr>
<td>1931</td>
<td>49</td>
<td>307</td>
<td>356</td>
<td></td>
</tr>
<tr>
<td>1941</td>
<td>49</td>
<td>305</td>
<td>354</td>
<td></td>
</tr>
<tr>
<td>1951</td>
<td>37</td>
<td>304</td>
<td>341</td>
<td></td>
</tr>
<tr>
<td>1961</td>
<td>24</td>
<td>276</td>
<td>300</td>
<td></td>
</tr>
<tr>
<td>1971</td>
<td>15</td>
<td>243</td>
<td>258</td>
<td></td>
</tr>
<tr>
<td>1981</td>
<td>17</td>
<td>214</td>
<td>231</td>
<td></td>
</tr>
<tr>
<td>1991</td>
<td>10</td>
<td>199</td>
<td>209</td>
<td></td>
</tr>
<tr>
<td>2001</td>
<td>07</td>
<td>158</td>
<td>165</td>
<td></td>
</tr>
<tr>
<td>2011</td>
<td>07</td>
<td>105</td>
<td>112</td>
<td></td>
</tr>
</tbody>
</table>

Source: Census of India, 2011.

Figure 2.11: Delhi: Rural Villages (1921-2011)

Source: Based on Table 2.6

Delhi has a single district union Territory till the mid 90’s. After the changes in the constitution during the late 90’s, the NCT has divided into nine
districts for the first time in 2001. These districts are North Delhi, South Delhi, East-West Delhi, New Delhi, Central Delhi, North-West Delhi, South-West Delhi and North-East Delhi. All districts, except New Delhi and Central Delhi have rural areas in their administrative jurisdiction. North-West district is largest and Central district is the smallest in terms of area. (Annexure II).

2.5 Demographic Profile

Delhi witnessed excessive growth just after independence due to flood of new refugees from Pakistan and the expansion of the government leading to growth in the commercial and industrial sectors of the economy. The National Capital Territory of Delhi with a population of 16.7 millions is one of the most populous metropolis and its decadel growth rate was 46 per cent between 1991-2001 and 21 per cent during the decade 2001-2011. The total population of Delhi is 1.34 per cent of the India’s total population and occupies 18th rank. In absolute figure, the total population of Delhi as per 2011 Census was 16,753,235 and out of this 8,976,410 were males and 7,776,825 were females. In urban Delhi, the total population recorded was 16,333,916 and 8,749,410 were urban male dwellers and urban female dwellers were 7,584,506. More than the 45 per cent of Delhi’s population resides in slums, unauthorised colonies and other unplanned settlements. (Table2.7).

According to 2011 Census, maximum number of people are living in North-West district followed by South, West, South -West, North- East, East, North and Central district but minimum number of masses were recorded in New Delhi district. North-West district with 3.6 million population constitutes 21.79 per cent of Delhi’s population and thus occupies the first position as per Census of 2011. The South district occupies second rank with 16.31 per cent of total population of Delhi, whereas New Delhi district ranks last with only 0.80 per cent population of Delhi as a whole. But as per the Census 2001, North-West and South districts had 20.67 and 16.37 per cent population of Delhi respectively. It is evident that the districts of North-West, West, North-East and South-East have increased in the percentage share of total population of Delhi, while on the other hand South, East,
North, Central and New Delhi districts have reported the decline in the percentage share of population since 2001. (Figure 2.12).

**Table 2.7: Delhi: District wise Male-Female Population (2011)**

<table>
<thead>
<tr>
<th>District</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Persons</td>
</tr>
<tr>
<td>1</td>
<td>3,651,261</td>
</tr>
<tr>
<td>North West</td>
<td>883,418</td>
</tr>
<tr>
<td>North East</td>
<td>2,240,749</td>
</tr>
<tr>
<td>East</td>
<td>1,707,725</td>
</tr>
<tr>
<td>New Delhi</td>
<td>133,713</td>
</tr>
<tr>
<td>Central</td>
<td>578,671</td>
</tr>
<tr>
<td>West</td>
<td>2,531,583</td>
</tr>
<tr>
<td>South West</td>
<td>2,292,363</td>
</tr>
<tr>
<td>South</td>
<td>2,733,752</td>
</tr>
<tr>
<td>NCT of Delhi</td>
<td>16,753,235</td>
</tr>
<tr>
<td>Urban</td>
<td>16,333,916</td>
</tr>
<tr>
<td>Rural</td>
<td>419,319</td>
</tr>
</tbody>
</table>

Source: Census of India, 2011.

**Figure 2.12: Delhi: District wise Distribution of Population (2011)**

Source: Based on Table 2.7
2.5.1 Growth of Population

During the last 100 years, growth in population has increasing trend. During 1901, the total population of Delhi was 4,05,819 persons. The population of Delhi had started growing rapidly since 1931 onwards but due to partition in 1947, the decadal growth of population declined sharply in 1951. But it has increased many folds after the independence. Consequently, the population in 2001 was more than 34 times of the population as it was in 1901. Delhi’s population has recorded 46.31 per cent decadal growth rate as against the national growth rate i.e. 21.34 per cent for 1991-2001. It is interesting to note that Delhi has reported decreased growth rate during 2001-2011 with 21 per cent decadal growth rate.

Decennial population growth of Delhi for last century is given in Table 2.8. This indicates that after 1951 the annual growth rate reached a plateau in 1981 at about 53 per cent before declining to 47.02 per cent in 2001 and further declining to 20.96 per cent in 2011. (Table 2.8 and Figure 2.13).

Table 2.8: Delhi: Decadal Population Growth (1901-2011)

<table>
<thead>
<tr>
<th>Year</th>
<th>Population in lacs</th>
<th></th>
<th>Per cent variation since previous Census</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>Urban</td>
<td>Rural</td>
</tr>
<tr>
<td>1901</td>
<td>4.06</td>
<td>2.09</td>
<td>1.97</td>
</tr>
<tr>
<td>1911</td>
<td>4.14</td>
<td>2.33</td>
<td>1.81</td>
</tr>
<tr>
<td>1921</td>
<td>4.88</td>
<td>3.04</td>
<td>1.84</td>
</tr>
<tr>
<td>1931</td>
<td>6.36</td>
<td>4.47</td>
<td>1.89</td>
</tr>
<tr>
<td>1941</td>
<td>9.18</td>
<td>6.96</td>
<td>2.22</td>
</tr>
<tr>
<td>1951</td>
<td>17.44</td>
<td>14.37</td>
<td>3.07</td>
</tr>
<tr>
<td>1961</td>
<td>26.59</td>
<td>23.59</td>
<td>2.99</td>
</tr>
<tr>
<td>1971</td>
<td>40.66</td>
<td>36.47</td>
<td>4.19</td>
</tr>
<tr>
<td>1981</td>
<td>62.20</td>
<td>57.68</td>
<td>4.52</td>
</tr>
<tr>
<td>1991</td>
<td>94.20</td>
<td>84.71</td>
<td>9.49</td>
</tr>
<tr>
<td>2001</td>
<td>138.50</td>
<td>129.19</td>
<td>9.43</td>
</tr>
<tr>
<td>2011</td>
<td>167.53</td>
<td>163.33</td>
<td>4.19</td>
</tr>
</tbody>
</table>

Source: Census of India, 2011.
No other city has grown as Delhi in the last three decades. Delhi city attract a large number of people from each and every corner of India who comes to Delhi to seek employment and better opportunities. The population growth in different local bodies is given in Table 2.9. Among all 3 local bodies in Delhi, highest growth rate was recorded by Municipal Corporation whereas New Delhi Municipal Corporation and Delhi Cantonment Board recorded negative growth rate.

**Table 2.9: Delhi: Population Growth in Local Bodies (1981-2011)**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>MCD</td>
<td>5862204</td>
<td>9024954</td>
<td>13423227</td>
<td>16419787</td>
</tr>
<tr>
<td>NDMC</td>
<td>273036</td>
<td>301297</td>
<td>302363</td>
<td>257803</td>
</tr>
<tr>
<td>DCB</td>
<td>85166</td>
<td>94393</td>
<td>124917</td>
<td>110351</td>
</tr>
<tr>
<td>Total</td>
<td>6220406</td>
<td>9420644</td>
<td>13850507</td>
<td>16787941</td>
</tr>
</tbody>
</table>


### 2.5.2 Urban Population

Delhi is a highly urbanised city. It has always shown an increase in population for decades. Migrated people mainly come for employment and education but they start living in urban slums and urban areas. 93.01 per cent of total population of NCT was
living in urban areas during 2001 in Delhi but it increased to 97.5 per cent during 2011. (Table 2.10).

Table 2.10: Delhi: Trend of Urbanisation (1901-2011)

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Urban Population</th>
<th>Urban Population (%)</th>
<th>Growth Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1901</td>
<td>214,115</td>
<td>52.76</td>
<td>-</td>
</tr>
<tr>
<td>1911</td>
<td>237,944</td>
<td>57.50</td>
<td>11.13</td>
</tr>
<tr>
<td>1921</td>
<td>304,420</td>
<td>62.32</td>
<td>27.94</td>
</tr>
<tr>
<td>1931</td>
<td>447,442</td>
<td>70.33</td>
<td>46.98</td>
</tr>
<tr>
<td>1941</td>
<td>695,686</td>
<td>75.79</td>
<td>55.48</td>
</tr>
<tr>
<td>1951</td>
<td>1,437,134</td>
<td>82.40</td>
<td>106.58</td>
</tr>
<tr>
<td>1961</td>
<td>2,359,408</td>
<td>88.75</td>
<td>64.17</td>
</tr>
<tr>
<td>1971</td>
<td>3,647,023</td>
<td>89.68</td>
<td>54.57</td>
</tr>
<tr>
<td>1981</td>
<td>5,768,200</td>
<td>92.73</td>
<td>58.16</td>
</tr>
<tr>
<td>1991</td>
<td>8,471,625</td>
<td>89.93</td>
<td>46.87</td>
</tr>
<tr>
<td>2001</td>
<td>12,819,761</td>
<td>93.01</td>
<td>51.33</td>
</tr>
<tr>
<td>2011</td>
<td>16,333,916</td>
<td>97.50</td>
<td>-</td>
</tr>
</tbody>
</table>

Source: Census of India, 2011.

Data of one hundred ten years (1901-2011) on population of Delhi reveals that urban population to total population has continued to rise from 0.21 million persons in 1901 to 16.33 million persons in 2011. The data reveals that the urban population of Delhi has increased nearly 80 times from 1901 to 2011. As far as percentage of urban population to total population concerned, it was only 52.76 per cent in 1901 Census and rose to 93.01 per cent in 2001 and 97.50 per cent in 2011 indicating the fast pace of urbanisation. (Figure 2.14).
As far as the distribution of urban population in different districts is concerned, the given Table 2.11 shows the trend:

**Table 2.11: Delhi: District wise Urban Population (1991-2011)**

<table>
<thead>
<tr>
<th>District</th>
<th>Percentage Urban Population</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1991</td>
</tr>
<tr>
<td>Central</td>
<td>100.00</td>
</tr>
<tr>
<td>New Delhi</td>
<td>100.00</td>
</tr>
<tr>
<td>East</td>
<td>90.19</td>
</tr>
<tr>
<td>West</td>
<td>92.78</td>
</tr>
<tr>
<td>South</td>
<td>95.73</td>
</tr>
<tr>
<td>North-East</td>
<td>86.30</td>
</tr>
<tr>
<td>North</td>
<td>95.35</td>
</tr>
<tr>
<td>North-West</td>
<td>85.35</td>
</tr>
<tr>
<td>South-West</td>
<td>82.10</td>
</tr>
</tbody>
</table>

Source: Census of India, 2011.
Table 2.11 reveals that proportion of urban population to total population for all the nine districts varies from about 93 per cent to 100 per cent according to Census 2011 and all these districts are considered to be highly urbanised. Among all the nine districts, Central and New Delhi districts are fully urbanised whereas third and fourth rank was occupied by South and North-East districts respectively. South-West and North-West districts have lowest position with 93.71 per cent and 94.15 per cent urban population respectively.

2.5.3 Density of Population

Density aspect is directly related to urbanisation. The intensity with which one square kilometers of land is used, increases the running demands of an ever-increasing population. According to Census 2011, the density of population of Delhi is 11297 persons per square kilometers as against 9294 persons per square kilometers in 2001. Although density of urban population have increased steadily but there is a greater difference between the two owing to the immigration. Urban density of population has always been more than the rural density of population of Delhi. (Table 2.12 and Figure 2.15).

Table 2.12: Delhi: Density of Population (1901-2011) (Persons per sq. km)

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Density</th>
<th>Rural Density</th>
<th>Urban Density</th>
</tr>
</thead>
<tbody>
<tr>
<td>1901</td>
<td>271</td>
<td>135</td>
<td>10568</td>
</tr>
<tr>
<td>1911</td>
<td>245</td>
<td>123</td>
<td>11798</td>
</tr>
<tr>
<td>1921</td>
<td>326</td>
<td>140</td>
<td>1812</td>
</tr>
<tr>
<td>1931</td>
<td>426</td>
<td>144</td>
<td>2639</td>
</tr>
<tr>
<td>1941</td>
<td>613</td>
<td>171</td>
<td>3470</td>
</tr>
<tr>
<td>1951</td>
<td>1174</td>
<td>243</td>
<td>7169</td>
</tr>
<tr>
<td>1961</td>
<td>1792</td>
<td>258</td>
<td>7225</td>
</tr>
<tr>
<td>1971</td>
<td>2738</td>
<td>403</td>
<td>8175</td>
</tr>
<tr>
<td>1981</td>
<td>4194</td>
<td>507</td>
<td>9745</td>
</tr>
<tr>
<td>1991</td>
<td>6352</td>
<td>1890</td>
<td>12361</td>
</tr>
<tr>
<td>2001</td>
<td>9294</td>
<td>1627</td>
<td>14387</td>
</tr>
<tr>
<td>2011</td>
<td>11297</td>
<td>1135</td>
<td>14667</td>
</tr>
</tbody>
</table>

Prior to the coming of the British, majority of population was confined within the walled city. Hence, the density of population in urban areas till 1911 was as high as 10568 in 1901 and 11798 in 1911. As Delhi becomes the capital of imperial India, more and more opportunities opened up for workers, professionals, traders, administrators etc. Hence, people started moving in the city. After independence, Delhi become a commercial and industrial centre, attracted a huge population and further it leads to encroachment of open spaces and intensive land uses. The increase in urban density is a result of this. On the other hand, rural growth has always been low indicating a comfortable land-man ratio. The ever-growing population and a steady encroachment on rural areas by the expanding city for various residential, industrial, trade, recreational, educational and other purposes is exerting high pressure on the available land in rural areas thus affecting its carrying capacity.

Amongst all 9 districts of Delhi, North-East district is on the top with 37346 persons per square kilometers and second position occupied by East Delhi having 26683 persons, followed by Central Delhi (23147 persons), West Delhi (19625 persons) and North Delhi (14673 persons). Remaining all four districts has lesser population density than the average population density (11297 persons) of Delhi. (Figure 2.16).
Figure 2.16: Delhi: Population Density, 2011

Source: Census of India, 2011.
2.5.4 Migration

It has largely increased due to development activities, extent of industrialisation, improved means of transportation and communication. Delhi is largely a city of migrants. Migration has always been a potent factor in its growth. (Table 2.13 and Figure 2.17).

Table 2.13: Delhi: Migrants from Different States (in per cent)

<table>
<thead>
<tr>
<th>State</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uttar Pradesh</td>
<td>49.61</td>
</tr>
<tr>
<td>Haryana</td>
<td>10.26</td>
</tr>
<tr>
<td>Bihar</td>
<td>13.87</td>
</tr>
<tr>
<td>Rajasthan</td>
<td>5.16</td>
</tr>
<tr>
<td>Punjab</td>
<td>4.72</td>
</tr>
<tr>
<td>West Bengal</td>
<td>3.18</td>
</tr>
<tr>
<td>Madhya Pradesh</td>
<td>1.85</td>
</tr>
<tr>
<td>Other States</td>
<td>11.35</td>
</tr>
</tbody>
</table>


Figure 2.17: Delhi: State wise Share of Migrants

Source: Based on Table 2.13
There were 60,14,458 migrants to Delhi in 2001, out of them 29,83,773 were from UP, contributing nearly 50 per cent, Bihar followed this with 8,34,205 migrants. After 1971 Census, the share of migrants in Delhi’s population is more than natural growth of the city. The share of migrants in Delhi’s population growth was 48.68 per cent in 1951-61, which increased up to 56.23 per cent in 1991-2001. (Table 2.14).

Table 2.14: Delhi: Growth of Population (1951-2001)

<table>
<thead>
<tr>
<th>Period</th>
<th>Total increase in Population</th>
<th>Natural Growth</th>
<th>Migrants</th>
</tr>
</thead>
<tbody>
<tr>
<td>1951-61</td>
<td>9.14</td>
<td>4.69 (51.31)</td>
<td>4.45 (48.68)</td>
</tr>
<tr>
<td>1961-71</td>
<td>14.07</td>
<td>8.82 (62.69)</td>
<td>5.25 (37.31)</td>
</tr>
<tr>
<td>1971-81</td>
<td>21.55</td>
<td>9.26 (42.97)</td>
<td>12.29 (57.03)</td>
</tr>
<tr>
<td>1981-91</td>
<td>32.35</td>
<td>13.91 (42.99)</td>
<td>18.44 (57.01)</td>
</tr>
<tr>
<td>1991-2001</td>
<td>43.62</td>
<td>19.02 (43.76)</td>
<td>24.53 (56.23)</td>
</tr>
</tbody>
</table>

*Growth of Population in Lakhs.
**Figures in Parenthesis indicate percentage.

2.5.5 Sex Ratio

Sex ratio is an important demographic indicator to study socio-economic characteristics of population. The sex ratio refers to the female numbers per 1000 males. It is continuously declining since the last 100 years. There was 821 females per 1000 males in Delhi in 2001. Delhi is also suffering from decreasing sex ratio and it can be possibly ascribed due to high migration of males to Delhi city in search of jobs. In 1911, the sex ratio recorded 862 which declined to 715 in 1941, situation improved slowly and continued to increase up to 1991 but during 2001 Census again there was decline of 6 females per 1000 males as it was 827 in 1991 Census. Sex ratio in 2011 has increased to 866 females per 1000 males.

District wise data of Delhi reveals that Central district occupies first position with 892 females per 1000 males whereas North - East district and East District have second and third rank respectively. Four districts namely North-West, New Delhi, South-West and South are below the average sex ratio of Delhi. (Table 2.15 and Figure 2.18 and 2.19).
Table 2.15: Delhi: Ranking of Districts by Sex Ratio (2011)

<table>
<thead>
<tr>
<th>Ranking</th>
<th>State/District</th>
<th>Sex Ratio (Females per 1000 males)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>India</td>
<td>940</td>
</tr>
<tr>
<td>1</td>
<td>NCT of Delhi</td>
<td>866</td>
</tr>
<tr>
<td>2</td>
<td>Central</td>
<td>892</td>
</tr>
<tr>
<td>3</td>
<td>North east</td>
<td>886</td>
</tr>
<tr>
<td>4</td>
<td>East</td>
<td>883</td>
</tr>
<tr>
<td>5</td>
<td>West</td>
<td>876</td>
</tr>
<tr>
<td>6</td>
<td>North</td>
<td>871</td>
</tr>
<tr>
<td>7</td>
<td>North West</td>
<td>862</td>
</tr>
<tr>
<td>8</td>
<td>South</td>
<td>859</td>
</tr>
<tr>
<td>9</td>
<td>South West</td>
<td>836</td>
</tr>
<tr>
<td></td>
<td>New Delhi</td>
<td>811</td>
</tr>
</tbody>
</table>

Source: Census of Delhi, 2011.

Figure 2.18: Delhi: District wise Sex Ratio (2011)

Source: Based on Table 2.15
Figure 2.19: Delhi: Sex Ratio (2011)

Source: Census of India, 2011.
2.5.5 Literacy Level

Literacy plays a very crucial role in the overall development of human beings, therefore it is a very important demographic aspect. According to Census 2011, a person is deemed as literate if he/she can read, write and understand any language; however a person who can merely read but cannot write is not a literate. Entire population of age group 0-6 years is excluded from the total population for this aspect. The literacy level in Delhi is higher than the all India average. According to 2011 Census, the literacy rate of Delhi is 86.34 per cent and it has gone up by 4.67 per cent in comparison to Census 2001, which recorded literacy rate of 81.67 per cent. One of the significant development is the narrowing of the gap between male and female literacy rate, a drop of 2.53 per cent, which is also the highest dip recorded so far. The difference between male and female literacy rate in Delhi is 10.10 per cent, which is also 6.58 per cent less than that recorded in the national literacy rate. It is an indication of great strides being made in educating women in the city.

District level data reveals that highest percentage of literates is recorded in East district with 88.78 per cent and lowest in North-East with 82.80 per cent. East, South-West, West, South, North and New Delhi area are having higher literacy level than the average literacy level of Delhi. In the context of male literacy, South-West and New Delhi is leading, followed by East and South Delhi area. Females of East Delhi are more literate as their percentage is highest with 88.45 per cent and lowest figure is recorded in North-East district (76.5 per cent). (Table 2.16 and Figure 2.20).
Table 2.16: Delhi: Total Literates by Sex (2011)

<table>
<thead>
<tr>
<th>State/District</th>
<th>Literates in per cent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Persons</td>
</tr>
<tr>
<td>NCT of Delhi</td>
<td>86.34</td>
</tr>
<tr>
<td>North-West</td>
<td>84.66</td>
</tr>
<tr>
<td>North</td>
<td>86.81</td>
</tr>
<tr>
<td>North-East</td>
<td>82.80</td>
</tr>
<tr>
<td>East</td>
<td>88.78</td>
</tr>
<tr>
<td>New Delhi</td>
<td>89.38</td>
</tr>
<tr>
<td>Central</td>
<td>85.25</td>
</tr>
<tr>
<td>West</td>
<td>87.12</td>
</tr>
<tr>
<td>South-West</td>
<td>88.81</td>
</tr>
<tr>
<td>South</td>
<td>87.03</td>
</tr>
</tbody>
</table>

Source: Census of India, 2011.

Figure 2.20: Delhi: District wise Literacy Rate (2011)

Source: Based on Table 2.16
2.6 Economic Profile

The primary sector, which includes agriculture, livestock, forestry, fishing, mining and quarrying shows reduction in contribution to economy of Delhi and also the secondary sector, which include manufacturing, electricity, gas, water supply and construction is decreasing. On the other hand, the tertiary sector also called as service sector consisting finance, insurance, business, public administration, trade, hotels, transport, communication, restaurant, storage and other services holds major contribution in Delhi’s economy. The share of primary sector was 3.85 per cent in 1993-94 which has come down to 0.62 per cent in 2010-11, but for service sector, the story is opposite as during 1993-94, its contribution was 70.95 per cent and touched 82.27 per cent in 2010-11. In the tertiary sector, banking and insurance, real estate and business services are contributing about 29 per cent in Delhi’s economy, followed by 21 per cent by trade, hotels and restaurants, 15 per cent by transport, storage and communication. Community, social and personal services are sharing 13 per cent only. In the secondary sector, the registered manufacturing sector is contributing 5 per cent and unregistered manufacturing sector is sharing 7 per cent while 8 per cent contribution is from construction sector in the economy of Delhi. The reason behind this change in the sectoral composition of Delhi’s economy, may be attributed to the rapid growth of urbanisation and consequential reduction in primary activities and significant increase in tertiary sector activities. Economy of NCT of Delhi is moving towards tertiary sector.

Main workers are those who had worked for the period of more than six months and who worked less than six months are termed as marginal workers. As per Census 2001, out of total workers, 95.0 per cent have been reported as main workers and the remaining 5.0 per cent as marginal workers whereas it was 99.6 and 0.4 per cent in 1991 respectively.

1 Planning Department (2011), Issues and Challenges for 12th Five Year Plan (2012-17), Government of NCT of Delhi, New Delhi.
2.6.1 Industrial Progress

From the majestic city of Mughals and Lutyen’s British Delhi, the modern capital of India has emerged today as one of the fastest growing metropolis of world. Favorable infrastructural facilities, developmental support, congenial tax structure, strategic location has encouraged Delhi to emerge as the single most important business center in the country, particularly in the Northern Region. In fact, Delhi serves as major commercial and distribution center for the entire Northern Region.

Delhi has witnessed phenomenal increase in the number of tiny, small and medium scale industrial units over a period of last four decades. Whereas in 1951, there were merely 8000 industrial units operating in Delhi, in 2001, the figure has already crossed 1.25 lakh marks. Table 2.17 gives information about industrial progress in Delhi in terms of the number of industrial units, the investment made and the value of production and the number of persons employed. (Figure 2.21).

Table 2.17: Delhi: Industrial Progress (1951-2001)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of Industrial unit</td>
<td>8160</td>
<td>17000</td>
<td>26000</td>
<td>42000</td>
<td>85050</td>
<td>129000</td>
</tr>
<tr>
<td>Investment (Rs. in Crore)</td>
<td>18.13</td>
<td>60.00</td>
<td>190.00</td>
<td>700.00</td>
<td>1659.00</td>
<td>2524.00</td>
</tr>
<tr>
<td>Production (Rs. in Crore)</td>
<td>35.35</td>
<td>121.20</td>
<td>388.20</td>
<td>1700.20</td>
<td>4462.00</td>
<td>6310.00</td>
</tr>
<tr>
<td>Employment</td>
<td>95137</td>
<td>187034</td>
<td>291585</td>
<td>568910</td>
<td>730951</td>
<td>1440000</td>
</tr>
</tbody>
</table>

Source: Directorate of Industries, Government of NCT of Delhi.

Figure 2.21: Delhi: Growth of Industrial Sector (1951-2001)

Source: Based on Table 2.17
Besides number of factories shown in the Table 2.17, the unregistered components of the industrial activity in Delhi are also in a sizeable quantity.

2.7 Social Profile

2.7.1 Education

It is an essential element of human development which plays a major role in improving economic opportunities for people in enhancing their quality of age by building their capabilities. Enhancing their skill levels and providing them with employment that is more productive. In the year 2011, Delhi has 5023 schools, which include 2563 pre-primary and primary schools, 588 middle schools and 1872 secondary and senior secondary schools\(^1\). In Delhi per capita expenditure on education (including sports, art and culture) is far above the national level. (Table 2.18).

<table>
<thead>
<tr>
<th>Year</th>
<th>Delhi Rural</th>
<th>Delhi Urban</th>
<th>All India Rural</th>
<th>All India Urban</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006-07</td>
<td>1304.27</td>
<td>1972.19</td>
<td>695.16</td>
<td>1312.50</td>
</tr>
<tr>
<td>2007-08</td>
<td>1703.30</td>
<td>2046.43</td>
<td>772.36</td>
<td>1471.54</td>
</tr>
<tr>
<td>2009-10</td>
<td>1761.00</td>
<td>2905.00</td>
<td>1054.00</td>
<td>1984.00</td>
</tr>
</tbody>
</table>


The city also hosts several important institutions of higher learning including the University of Delhi and its affiliated colleges and Research institutions. Jawahar Lal University, Jamia Millia Islamia University, Inderprastha University, Indian Agricultural Research Institute, Indian Institute of Technology and All India Institute of Medical Sciences.

2.7.2 Housing

However, significantly less crowded than Mumbai and Calcutta, Delhi nevertheless suffers from a serious housing shortage. While the city has nearly two million

\(^1\) Directorate of Economics Statistics (2012), op. cit.
dwellings, the occupancy rate is relatively high at over five persons per housing unit. Since the 1950’s, the government has removed over a million citizens from slums to new housing projects, the largest such shifts in the world. Still, the city faces major problems in the provision of utilities. Water is in short supply, especially during the pre-monsoon months, in the late spring and early summer and the major source, the Yamuna River is polluted by untreated sewage and industrial waste. Approximately 70 per cent the city’s population lives in homes that are not connected to the sewage system. (Table 2.19).

Table 2.19: Delhi: Total Number of Households and Available Facilities

<table>
<thead>
<tr>
<th>Available Facilities</th>
<th>Households (2011)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total no of households</td>
<td>3340538</td>
</tr>
<tr>
<td>Rural Households</td>
<td>79115</td>
</tr>
<tr>
<td>Urban Households</td>
<td>3261423</td>
</tr>
<tr>
<td>Electricity</td>
<td>3310809</td>
</tr>
<tr>
<td>Toilet</td>
<td>2990741</td>
</tr>
<tr>
<td>Piped water supply (within household premises)</td>
<td>2618982</td>
</tr>
</tbody>
</table>

Source: Census of India, 2011.

It is evident from the Table 2.19 that approximate 99 per cent households of Delhi are connected with electricity supply. The toilet facility which is considered very significant for a healthy and hygienic life is available within premises only in 89 per cent of households in Delhi. The major source of water supply is piped water supply and according to 2011 Census, approximate 80 per cent households of Delhi are getting water supply within premises of household. Remaining households depend upon different sources of water supplies like public hydrants, hand pumps, water tankers etc.

2.8 Water Resources

The river Yamuna is the only perennial drainage which flows through the National Capital Territory of Delhi. Three canals – the Eastern and the Western Yamuna canals and the Agra Canal – branch out from the Yamuna River from the Bawana, Rajpur
and Lampur distributaries. Delhi’s water resources consist of both surface and groundwater. Delhi gets over 86 per cent of its water supply from surface water. Yamuna provides the major share of this supply. Delhi’s share of this river’s resources, as per interstate agreements, is 6.04 per cent. Water from the Yamuna river is abstracted both directly from the river at Delhi and indirectly via the western Yamuna canal, which also delivers water to Delhi. Another sources of water supply to Delhi, through different interstate agreements, include the Himalayan Rivers and subsurface sources like ranney wells and tubewells. Raw water from the Himalayan rivers is conveyed via the Upper Ganga and Bhakra Canal (Narwana branch) respectively. Surface water source availability in Delhi was 690 MGD in 2013, out of which 310 MGD comes from Yamuna river, 240 MGD from Ganga river and 140 MGD from Bhakra Beas Management Board. About 115 MGD of groundwater is being explored through ranney wells and tubewells of Delhi Jal Board. (Figure 2.22).

Figure 2.22: Delhi: Sources of Water Supply

![Source: Economic Survey of Delhi 2012-13.](image)

Groundwater represents around 14 per cent of Delhi’s water resources officially, even though pumping of the aquifer by domestic consumers and industries remains a wide spread strategy to cope with unreliable water supply in Delhi. Owing to escalating

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population, without a commensurate increase in the availability of raw water, the groundwater in Delhi has been over exploited. This has disturbed hydrological balance leading to decline in the productivity of tubewells, increasing pumping cost and more energy requirements. The quality of groundwater is also deteriorating and has been found to be unfit for human consumption at several places.

2.9 Conclusion

The study area is mainly plain with elevation ranging from 198 meter to 220 meter above the mean sea level. Administratively, it is divided into 9 districts. Physiographically, the Aravalis is an important feature lying to the south and river Yamuna flows in the east of the study area. The soils are of moderate fertility. Geologically the ridges and plateaus of Delhi quartzites owe their existence to the hard quartzite which are resistant to erosion in quaternary period. The natural drainage system in the area includes 17 drains of varying catchment areas and capacities among which the Najafgarh drain is the largest. The climate of Delhi is characterised by extreme summer months of July, August and September with temperature as high as 47 degree Celsius and January as the coldest month. Rainfall of the area is maximum during the month of July and August. Delhi with the population of about 16.7 million is one the most populous metropolis. A silent feature of the growth scenario is the decline in the growth rate from 47.02 per cent in 2001 to 20.96 per cent in 2011. The urban population of Delhi increased up to 97.5 per cent during 2011 which shows the fast pace of urbanisation. With the rapid speed of urbanisation, rural area of Delhi is shrinking continuously. Population density of Delhi is highest in the country and it was 11297 persons per square kilometers in 2011. The sex ratio in Delhi is low as compare to national average, which can be possibly described due to high migration of males in search of work. Economy of Delhi is dominated by tertiary sector and Delhi has more than two and half times per capita income than national average. Delhi’s water resources consists of both groundwater and surface water. 39 per cent of Delhi’s raw water comes from Yamuna River followed by 30 per cent through Ganga river. Bhakhra Beas Management Board and Groundwater contributes 17 per cent and 14 per cent respectively to Delhi’s raw water. Delhi’s own water resources can barely meet 15 per cent of the total demand of water, so the bulk of supply has to come from neighboring states.