CHAPTER II
STUDY AREA

2.1 Introduction:

Haryana, a state in the northern part of the Indian union came into existence, on November 1, 1966, as a result of reorganization of composite Punjab. The Hindi speaking parts of the composite Punjab came to be known as Haryana. It is spread over an area of 44, 212 sq. km and is the sixth smallest state in the country, accounting for 1.4 per cent of its area. It lies between 27°39' and 30°55' north latitudes and 74°24' and 77°36' east longitudes. It is bounded on the north-west by Punjab, on the north-east by Himachal Pradesh, on the east by Uttar Pradesh and the union territory of Delhi and on the South by Rajasthan.

The state consists of four divisions, namely Ambala, Rohtak, Gurgaon, and Hisar. Administratively, the state has 21 districts, 71 tehsils, 44 sub tehsils, and 119 blocks, and 6764 villages as per the 2001 census. Map 2.1 shows the location of Haryana in India and map 2.2 to 2.6 shows the administrative divisions of the state. Haryana has its glorious past and is included as one of the most developed states in the country. It has been a land of profound mythological and historical significance where some ancient to modern civilization flowered through the ages. The hallowed land and its sturdy people have a rich and unparallel heritage of spiritual values and martial traditions (Quraishi, 1985:9).

2.2 Physical Settings

2.2.1 Relief and Topography:

It is a well documented fact that physical evolution of a plain is dynamic process. It is the aggregate sum of aggradational and degradational processes. As Davis had once said 'landscape is the function of time, space and process’. The Indo-Gangetic plain that lies in between the peninsular and extra peninsular region is one of the fertile regions of India that is spread over more than 5 lakh sq km area. According to scientists there was a vast geosyncline here before the
evolution of this plain. A continuous deposition by some of the rivers from both the sides viz. extra peninsular and peninsular India filled the gap over the millions of years which resulted in the formation of a vast Indo-Gangetic plain (Encyclopedia of Haryana 2010). Physiographically, the state can be divided into six regions (Singh R.L., 1971:83). Map 2.7 shows the physiographic division of the state.

(i) The Shivalik hills tract: It is a vast area comprising sand, silt, clay, and conglomerates, which have been carved into quite sharp slopes by the numerous rainy seasonal streams. These hills are about 500 m high. Several seasonal streams come down from the slopes of the Shivalik hills and spread a layer of gravels, boulders and pebbles and soils in their beds and make the region fertile. This tract mainly comprises the northern fringe of Ambala district. Pinjore and Kalka are two of the important tourist places situated there.

(ii) The dissected rolling plain in the foothills: Next to the Shivalik hills is northern part of Ambala district. This is about 25 km wide. It is located at 300 to 375 m in height above the mean sea level. The Ghaggar and the Markanda are two important seasonal streams in this plain. This plain contains large stretches of sand, silt and pebbles in the beds of seasonal streams, which come down from the slopes of the Shivaliks hills.

(iii) The upland plain or the Ghaggar Yamuna Doab: It includes most of the Ambala, Kurukshetra, Karnal, Jind, Sonepat, Rohtak, Hisar and eastern parts of Sirsa district. It is 220 to 280 m in height above the mean sea level. It is almost a level plain. In general, it slopes gently from the north east to the south west, in which direction most of its streams like the Markanda, the Chanting, the Saraswati etc. flow.

(iv) The flood plains: The flood plain areas of the rivers like Ghaggar and Yamuna include district Ambala, Kurukshetra, Sirsa, Karnal, Sonepat, and Gurgaon districts. The flood plains of the river Ghaggar is narrow in Ambala district, but it widens considerably in Kurukshetra and Sirsa districts. It is generally shallow. The flood plains of the river Yamuna is narrow in Ambala district, widens in the Kurukshetra, Karnal, and Sonepat districts, but again narrows in Gurgaon district. It lies considerably lower than the uplands plain to its west, and is separated from the latter by broken chains of cliffs and sand
dunes. It is undulating plain and contains interlocking channels of streams ponds and swamps.

(v) The plain with sand dunes: This part lies to the south of aforementioned upland plain. It comprises parts of Sirsa, Hisar, Bhiwani and some parts of Mahendergarh and Rohtak districts. It ranges in height from 200 to 220 m above the mean sea level. This part of Haryana is different from other parts due to the presence of a number of sand dunes. The climate is semi arid type, so the erosional work of wind is more active in this part.

(vi) The plain with Aravali Hills and Sand dunes: This is the southernmost part of the state and includes Mahendergarh Bhiwani, Rohtak, and Gurgaon districts. In fact it is a sandy tract. Some of the seasonal rivers like the Dohan, the Krishnawati, and the Sahibi streams rises here and bring water from the Aravalis hills of Rajasthan. In some places the hill slopes are quite steep, bare, and rocky. Between the ridges a number of depressions exits and known by local name Jhil e.g. the Kotla Jhil (Dhankhar, 2003).

2.2.2 Climatic conditions:

Haryana lies in the sub tropical type of climate that may be further sub characterized into arid, semi-arid and sub-humid. Rainfall constitutes the primary source of water in most part of the state as there are no major perennial rivers except Yamuna draining the region. The agriculture based economy of the state depends on the annual rhythm of rainfall which mainly receives from south-west monsoon during rainy season in the month of July. Channel runoff, ground water infiltration, seepage and sub-surface storage is possible and activated only through precipitation. The state receives an average annual rainfall of about 650 mm. The average annual rainfall varies from less than 15 mm in (Sirsa) western part of the state to over 55 mm in (Yamunanagar) eastern and north eastern part of the state. Table 2.1 shows the average annual rainfall in Haryana. The velocity of wind over the state is maximum in the month of May and June (8-11 km/hr). The mean daily pan evaporation ranges from 2.4 mm in December and January to 13.4 mm in May and June. The potential evaporation is 200 mm per annum. Minimum temperature becomes close to freezing point towards the end of December and beginning of January, and the maximum daily temperature
reaches above 40°C in the months of May and June. The mean annual temperature ranges from 23°C to 26°C. The climatic conditions in the state can be described in terms of three seasons, viz. summer season, winter season, and rainy season.

1. Summer Season:
Summer season roughly stretches from the month of March to June. The summers are very hot and scorching in nature. The summer are marked by sharp rise in temperatures and consequent decrease in relative humidity, giving

<table>
<thead>
<tr>
<th>Districts</th>
<th>Average Rainfall (In m.m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambala</td>
<td>66.83</td>
</tr>
<tr>
<td>Panchkula</td>
<td>85</td>
</tr>
<tr>
<td>Kurukshetra</td>
<td>59.18</td>
</tr>
<tr>
<td>Sirsa</td>
<td>15.29</td>
</tr>
<tr>
<td>Hisar</td>
<td>21.72</td>
</tr>
<tr>
<td>Fatehabad</td>
<td>27.39</td>
</tr>
<tr>
<td>Kaithal</td>
<td>30.60</td>
</tr>
<tr>
<td>Jind</td>
<td>25.51</td>
</tr>
<tr>
<td>Karnal</td>
<td>36.63</td>
</tr>
<tr>
<td>Panipat</td>
<td>29.46</td>
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<tr>
<td>Sonipat</td>
<td>40.63</td>
</tr>
<tr>
<td>Rohtak</td>
<td>27.04</td>
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<tr>
<td>Faridabad</td>
<td>40.33</td>
</tr>
<tr>
<td>Rewari</td>
<td>38.49</td>
</tr>
<tr>
<td>Mahendergarh</td>
<td>37.62</td>
</tr>
<tr>
<td>Gurgaon</td>
<td>37.23</td>
</tr>
<tr>
<td>Yamunanagar</td>
<td>57.49</td>
</tr>
<tr>
<td>Bhiwani</td>
<td>55.91</td>
</tr>
<tr>
<td>Jhajjar</td>
<td>30.91</td>
</tr>
</tbody>
</table>

Rise to hot winds locally called “Loo”. They are more active in the months of April and June. They blow steadily from the west, and are scorching in nature they die out at the outburst of Monsoon. Another unpleasant feature of this season is marked by origin of dust storms that is quite a common phenomenon at evening time before the onset of the monsoon season. Dust storms are frequent phenomena in the region and they became more active and intensified in the late afternoon hours and sometimes bring light showers also. Dust storms are locally called by people as Andhi.

**Winter season:**

The winter season starts in the month of October and continues till the end of February. This season is associated with extremely low temperature during the month of Dec/Jan. The state of Punjab and Haryana come under the effects of the western disturbances during this season. The whole of the state receives winter rainfall at this time due to the effect of western disturbances. This rainfall is beneficial for Rabi crops in the region.

**Monsoon season:**

Monsoon season is an annual phenomenon which starts in the Great plain in somewhere in the first week of July and remains active till the end of August. The season is marked by pleasant weather with abundant amount of rainfall. This rainfall forms the base for kharif cultivation. The failure and success of monsoon directly affect our annual food grain production.

**2.2.3 Drainage system:**

There are two major rivers in Haryana viz. the Yamuna and the Ghaggar. The main source of rivers in the state is Himalayas and Aravali Hills. The rivers like Yamuna and Ghaggar which originate in the Himalayas are perennial in nature while the rivers which origins from Aravalli hills are seasonal in nature. So basically there are two drainage system in the state e.g. northern drainage system and southern drainage system.

The northern drainage system: The Rivers of this system rise in the Himalayas. The main rivers of this system are Yamuna, Ghaggar, Markanda,
Tangri, and Saraswati. Yamuna is one of the largest tributaries of the river Ganga. This rises from the Bander Punch peaks of the Yamunotri glacier at the height of 6330 m in Garhwal Himalayas. The river Yamuna enters in Haryana at Kalesar in Yamunanagar district. The main tributaries of Yamuna are Somb, Pathrata, and Budhi Yamuna. The Western Yamuna canal has been taken from Yamuna River in the year 1879 to a place named Tajewala.

The Ghaggar River rises from Dhaoghai in Sirmor district of Himachal Pradesh. This river flows in Panchkula, Ambala, Kaithal, Fatehabad, and in Sirsa district. After flowing for 291 km it enters into Hanumangarh district of Rajasthan. The river Markanda rises from Dhantidar in Himachal Pradesh and enters Haryana at Kala-Amb. The river Tangri rises from Morni hills of Haryana. This river flows in the Ambala district of state and finally enters in Patiala district of Punjab.

Southern drainage system: The drainage pattern of southern Haryana is almost seasonal in character. The river Sahibi rises from Sivar hills in Jaipur districts of Rajasthan. This river enters in Haryana at Akoli in Rewari district. The river Krishnavati rises from Nim Ka Thana of Jaipur hills. This river enters in Haryana at Mahendergarh district.

2.2.4 Canal system:

Haryana has a very wide network of canals. The state has made tremendous progress in this area of agriculture infrastructure development since the time of independence particularly after the year 1970-71. The leveling of undulating plains, linking of some rivers and government policies made it easy to dig canal in this semi arid part of the country. In other words, it can be said that the length of canal increase significant way after its making of state. Map 2.8 shows the canal network in the state.

Mainly there are eight canal systems in Haryana which is in following manner:

1. Bhakhra Canal System
2. Western Yamuna Canal System
3. Shivani Lift Canal system
4. Jui lift canal system
5. Loharu Canal system
6. J.L.N. Canal System
7. Gurgaon Canal System
8. Agra Canal System

The above mentioned canal system can be divided into mainly three broad systems that is in following manner.

1. Bhakhra canal system unit
2. Western Jamuna canal system unit
3. Lift system unit

1. Bhakhra canal system: This system came in to existence after the independence. This system receives water from Bhakhra barrage which is joint venture of Punjab and Haryana. Presently three state viz. Punjab, Haryana and Rajasthan receive water from this project. Bhakhra barrage was one of the largest water barrages in northern India till recent time but now Tehari dam of Uttrakhand is the largest one. Several small outlets have been carved out from this system to provide water for drinking, irrigation, and other purposes in the states of Punjab and Haryana.

2. Western Jamuna canal systems: This system is the second most important system after Bhakhra system. The system starts from Hathin Barrage near Yamunanagar. This system provides water for drinking and irrigation purposes. This system also provides water to national capital Delhi also. The numerous small channels which are curved out from this system fulfill the irrigational need of the people of this area.

3. Lift system units: This system provides water by lift system. This system provides water in the semi-arid belts of the state. The lift irrigation system was initiated in the state during Late Choudhary Bansilal regime.

2.2.5 Soils:

The state has vast plain area consisting variety of soils. Presently the state has fallen a victim of problems of land degradation in terms of water depletion, water rise, salinity etc. But despite this degradation the state has established itself as an example in agricultural development. The credit directly goes to her rich alluvium soils. In order to ensure optimum agricultural production and to
make it sustainable, it is also essential to know the basic facts about the soils of the state. The present section is devoted to the same.

**Soil scientists have categorized the soils of Haryana into five major groups. They are as follows:**

1. **Reddish chestnut soils:** They are found in areas having annual rainfall of 1000 to 1500 mm. The soils are mildly acidic to neutral in reaction. Erosion by water is a serious problem in these soils. These soils are further classified into three types (a) Typic usto-chrepts, (b) Typic ustorthents and (c) Alfic usto-chrepts soil associations.
   a) Typic usto-chrepts: These soils are coarse to fine loam in texture, reddish and brown in colour. These are deep soils of semi-arid region that have shallow horizon in which carbonate have accumulated.
   b) Typic ustorthents: These soils are coarse loamy, deep and light coloured soils of ustic (very dry) moisture regime. They do not show any of development and generally marked by stratified depositions by various agencies at different places.
   c) Typic/Alfic usto-chrepts: These soils are similar to typic Usto-chrepts except that soils have high base saturation.

2. **Typical arid brown soils:**

   These soils are found in areas having annual rainfall of 750-1000 mm. These soils do not have calcium carbonate layer within one meter depth. There are some pockets of depressions which are poorly drained. These soils are further grouped as (a) Typic/Alfic Usto-chrepts (b) Typic comborthids and (c) Typic/Aquick Natrustalts.

   a) **Typic/Alfic Usto-chrepts:** These soils are similar to typic Usto-chrepts except that have high base saturation.

   b) Typic comborthids: These soils are deeps, light coloured soils with combic or calcic horizon. High salts cause physiological drought. They are course to fine loam in texture.

   c) Typic/aquick Natrustalts: They are course to fine loam in texture. These soils are affected by salinity and alkalinity problems. Water come on the upper surface by capillary action in such type of soils which evaporate at day time when it was high sun in the horizon leaving white patches of salt on the soil.
Arid type of soils

These soils are found in areas where rainfall various from 500-750mm. Salinity and alkalinity are serious problems in irrigated canal command areas. They are calcareous in nature and also dominated by kankar layer in the strata. They Occur at a depth of 1-15 meter. The main Associations recognized with these soils are Typic Halaquepts.
a. Typic Halaquepts: These soils are coarse to fine loam in texture and also affected by sodicity. They have grey to black surface horizon and mottled grey sub surface horizon due to natural drainage.

(4) Sierozem soils
These soils are found in areas where rainfall various from 300-500 mm. Salinity and alkalinity problems appear in irrigated areas. They are calcareous and usually have a kankar layer at a depth of 75-125 centimeters. These soils are classified into Typic Comborthids, Typic Ustotepts, Typic Calciorhids and Typic/Ustic Torripsamments. The first two are already mentioned hence only the rest are described here.
a. Typic Calciorhids: These are light coloured, coarse loamy soils which have more than 15% calcium carbonate. Calcium horizon is within one meter of the surface.
b. Typic / Ustic Torripsamments: They are loamy sand or coarse up to one meter of soil surface. These soils are deep and coarse texture.

(5) Desert soils
The soils are found in the areas having rainfall about 300mm. Wind erosion is a serious problem in this soil. The extreme low rain fall condition also creates the problem of extreme aridity. These soils are light in colour and made numerous local topography e.g. Sand dunes, Bargans etc. These soils are classified as typic/torri ustisarhnents as explained before.

2.2.6 Flora and Fauna:
Due to diversity of climate in the state there is also diversity in vegetation of the state. There is Shivalik hills in the northern parts and Aravali hills in the south-west which are rich in both flora and fauna. Although there are numerous types of vegetations, and herbs which are found in the state, broadly they can be classified in to three types. The classifications of vegetation are in following manner.
(1) Northeast’s humid vegetation.
(2) Southwest’s dry vegetation.
(3) Other vegetation

Northeast’s humid vegetation: This type of vegetation is mainly found in
Punchkula, Yamunanagar, and in Ambala districts. Situated in the foot hills of
Shivalik hills this part of the state receives very high rainfall. Hid (Pinus
roxburghii) and Sal (Shorea robusta) are two main trees which are found in
Morni hills. The other important trees that are found in this part are Main Rati
(Abrus precatorius), Molsiri (Mimusops dengi), Kher (Acacia catechu), Arjun
(Terminalia Arjuna), Baheda (Terminalia bellerica), Harad (Terminalia
chebula), Anjir (Ficus carica), Mango (Mangifera indica), Avla (Emblica
officinalis), Semal (Bombax ceiba), Palash (Butea kmonos perma), Ama Itash
(Cassia fistula), Baus (Dendrocalamus strictus), Lentana (Lentana camara), Emli
(Tamarmidu5 indica), Bhabar grass (Ealaliopsis bipinata).

South-west's dry vegetation: These are xerophytes type of vegetation and
mainly found in semi-arid part of the state and this is characterized by less leaf,
deep root system and conical shape leaps. The bark of these trees is very thick.
This type of vegetation is found in Rewari, Mahendargarh, Jhajjar, Rohtak,
Gurgaon, Mewat, Bhiwani, Hisar, and Sirsa districts. The main trees of this
vegetation are Janti or Khejri (Prosopis cineraria), Jal (Salvadora oleoides), Ker
(Capparis aphyalla), Karoncla (Carisa carandas), Hul Hul (Cleome viscosae),
Firash (Tamarix dioaca), Rohida (Tecome/la undulate), Kikar (Acacia nilotica),
Gokhru (Pedalium murex), Mehandi (Lawsonia innermis), Bhurat (Cenchrus
ciliaris), Sarkanda (Soccharum rora), Gadumba (Citruilis copeynthus).
Other vegetations:

Other than these two types of vegetation there is also some other type of
vegetation which is found in Haryana. For example Nim (Azadirachta indica),
Cholai (Amaranthus viridis), Bathua (Chenopodium album), Ja malghota
(Croton bonplandianum), Dhub (Cynodon dactylon), Shisham (Da/bergic sissoo),
Dhatura (Datura inoxia), Pipal (Ficus religiosa), Karela (Momordica
charantia), Tulsi (Ocimum sanctum), Congress grass (Parthenium
hysterophorus), Arandi (Ricinus communis), Santhi (Trianthema

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porthlocastrum), Bhakri (Terrestris teukostris), Ashvagangha (Withania somnifera), Jangli Palak (Rumax hastodus) etc.

The state was very rich in biodiversity till some recent times but with the onset of green-revolution in the mid-1960s and subsequent growth in economic activities has led to a dynamic change in every sphere of development in state viz. road development, railway, urbanization, SEZ etc. This directly halted the natural habitat and niche of animals in the state. Since the last some years the population of animals declined with a greater pace over the time. But this does not mean that there are no any varieties of animals in the state.

An account of the biodiversity found in the state is as follows:

Sher (Panthera leo), Bagh (Panthera tigris), and Tendua (Panthera posidus), that were found in the state till some years now almost diminished from the surface. Some other animals that are found in the state are Jangli Bilali (Felis chases), Jarkh (Hyeno), Gidad (Canis quiries), Bhediya (Canis lupus), Lomdi (Vulpes bengalonis), Dear (Melusus ursinus), Sehi (Hystric indica), Khargosh (Lepus nigrcttis), Monkey (Maccaca mupatta), Langur (Presdytis entellus), Black buck (Antelope crevicarpa). They are mostly found in Hisar, Rohtak, Jhajjar, and Sonepat districts. Blue cow (Voselaphus tragocamelus), is found in Bhiwani, Hisar, Rohtak, Rewari, Mahendargarh, Jhajjar, Sonepat, and in Sirsa district. It is important to be noted that Blue Cow is also the state animal of Haryana. There are some famous lakes, pond and biodiversity places in the state. Among them Sultanpur, Badkhal, and Bhindvasa are most famous lakes of Haryana. Actually they are bird sanctuary. These lakes, forest, hills, and other local water bodies are the home of birds. The main birds found in Haryana are Debchik, or Grebe, spotted billed, pelican, Great white billed Heron, Pond Heron, Grey leg goose, Ruddy shelduck, Pintail, Common Teal, Pariah or Black Kite, Black or King vulture, Indian white backed vulture, Black patridge, Grey patridge, Common pea-fowl, Sarus crane, White breasted water hen, Coot rudy crack, Moorhen, White tailed lapwing, Green pigeon, Blue rock pigeon, Common Hawk cuckoo or Brain fever bird, Spotted owlet, Blue joy, Myna, Bulbul, Crow, and House sparrow etc.
2.2.7 Minerals and Ores:

The state is poor in mineral resources because most of the part of the state is underlain by thick alluvium strata. It means to say that most of the physiography of the state is recently formed by river deposition which is lack in mineral formation. It is fertile and rich in alluvium soils. The main districts where minerals are found are Bhiwani, Mahendergarh, Mewat, Faridabad, Yamunanagar, Ambala, and Panchkula.

The main mineral resources found in Haryana are-

1. Iron Ore- The quality of iron ore which is found in the state is very poor because there is less quantity of iron in the ore. The iron ore is basically found in Mahendergarh district.

2. Lead, Zinc, Tin, Tungstan ore- These minerals are found in Tosham hills of Bhiwani district.

3. Mica- Mica is found in Nagal Sirohi, and Mahendergath district.

4. China clay- China clay is used for making pottery. This is mainly found in Aipur, Bhondsi, Kasan and Nathpur villages of Gurgaon district.

5. Other Minerals- The other minerals are feldspar found in Panchkula district, Graphite in Mahendergarh district, and Manganese in Narnoul tehsil.

2.3 Cultural Settings

2.3.1 Social and Demographic Profile of Haryana: The state of Haryana is endowed with vast plain area, good alluvium soils, favourable climatic conditions, abundant water etc. These are some of the factors which are responsible for high density of population. Highest per capita income, good medical facilities, infrastructure development, development of agricultural and other availability of social amenities is responsible for steady increase in population during the recent past. The total population of the state that was 10036431 persons in the year 1971 increased to 25351462 persons in the year 2011. But one of the negative and important aspects of this increase is decline in total population of female. It is clearly evident from the table 2.2 that sex ratio in Haryana has decline over time and it is one of the worst affected states in this
matter. The sex ratio that was 867 female per one thousand male population in the year 1971 decline to 861 female per one thousand male population in the year 2001. This was the lowest sex ratio ever recorded in the state. The main reason behind this decline in sex ratio is sex selective abortion increase in per capita income, high growth in agriculture development, increase in medical facilities, use of ultrasound facility etc. Other than this the in migration of male working population from adjoining states e.g. western Uttar Pradesh and from Bihar is also found a factor in increasing of male population in the state during the period under study. Most of such migrant are agricultural labourer. However in the next decade some remarkable increase is registered in this matter when sex ratio reached a level of 879. Table 2.2 shows increase in population and trend of sex ratio respectively.

Table 2.2

<table>
<thead>
<tr>
<th>Year</th>
<th>Population</th>
<th>Decadal Percentage increase</th>
<th>Sex ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>1971</td>
<td>10036431</td>
<td>32.79</td>
<td>867</td>
</tr>
<tr>
<td>1981</td>
<td>1292119</td>
<td>28.75</td>
<td>870</td>
</tr>
<tr>
<td>1991</td>
<td>16463648</td>
<td>27.41</td>
<td>865</td>
</tr>
<tr>
<td>2001</td>
<td>21144564</td>
<td>28.43</td>
<td>861</td>
</tr>
<tr>
<td>2011</td>
<td>25351462</td>
<td>19.89</td>
<td>879</td>
</tr>
</tbody>
</table>

Source: Statistical abstract of Haryana1970-71 to 2010-2011 and compiled by research scholar.

The population composition of Haryana is dominant by different religious and social groups. The main religious groups are Hindu, Sikhs, Muslims, and Jains. But according to 2011 census the main religious group among them is Hindu and Muslims. They constitute 22171128 Hindus and 1781342 Muslims respectively out of the total population of 25351462 of the state. The main caste
system dominated by Jat, Brahmín, Rajput, Ahir, Khatri, Kumhar, and Chamar. The total population of the scheduled caste is 1393506.

<table>
<thead>
<tr>
<th>Years</th>
<th>Sex Ratio in Haryana</th>
<th>Females per thousand males</th>
</tr>
</thead>
<tbody>
<tr>
<td>1971</td>
<td>857</td>
<td>850</td>
</tr>
<tr>
<td>1981</td>
<td>870</td>
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<td>1991</td>
<td>865</td>
<td>870</td>
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<tr>
<td>2001</td>
<td>861</td>
<td>870</td>
</tr>
<tr>
<td>2011</td>
<td>879</td>
<td>870</td>
</tr>
</tbody>
</table>


2.3.2 Education: Literacy is one of the first steps to attain formal education. According to united nation organization literacy refers to read and write in any language of the world. Table 2.3 shows that the female literacy rate in Haryana that was at low level of merely 25.71 percent in the year 1971 increased to 37.13 percent by time of 1981 census. Over the years it has improved and recorded a remarkable level of 55.85 percent by the end of 1991 census year. No doubt this was a remarkable improvement that reflects the concentrated effort of the state government along with the assistance of non-governmental organization. The successive years also registered increase in literacy rate. For instance it recorded a level of 75.55 percent in the year 2011. Literacy rate of male is higher than that of female. There are 24 universities, 903 colleges and 7060 high/senior secondary school in the state. The level of education has improved in the state with the passage of time due to increasing facility of research, development of infrastructure, good health facilities, good agriculture etc. Choudhary Charan Singh Krishi Vishvevidhalaya is one of
largest university in Asia. The other two A grade university are Kurukshetra University Kurukshetra and Maharishi Dayanid University Rohtak.

Table 2.3 Literacy Rate in Haryana

<table>
<thead>
<tr>
<th>Year</th>
<th>Literacy Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1971</td>
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<td>2001</td>
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<tr>
<td>2011</td>
<td>75.55</td>
</tr>
</tbody>
</table>

Source: Statistical abstract of Haryana 1970-71 to 2010-11 and compiled by research scholar.
2.3.3 Art and culture: Because much of daily life of the people is directly related to agriculture, dance art, culture and other activities in Haryana so the daily life of the society is related to these activities. Cattle wealth, good food, rainfall, and prosperous life lend their places in folk dances. Most of the folk dances, folk songs and dramas are performed at the time of crop harvesting and other festivals. Some of them are discussed below:

2.3.4 Folk dances: Like folk songs, the folk dances of Haryana are of different kind according to season and occasions. As women and girls are shy to sing and dance with men, they dance separately. The “Dad” or “Dhamal” dance is very popular. It has been performed in the republic day programmes and in Holi festival. The dance is very popular before the month of March. The drum dance of men is also known as the stick dance. Popular belief is that the followers of Guga Pir indulge in this dance. This dance is performed at midnight of the third and fourth Bhardrapad. Some special dances of women are “Chhati dance”, Ghori dance” and Ghora dance”etc. They performed on marriage occasions.

2.3.5 Folk Drama: Haryana’s folk dance and drama are known as “Saang” or “Sangeet”. “Saang is really a abbreviation of word “Sangeet”. “Saang” is performed on occasion of birth party, marriage party and at rally places, etc. “Saang” may be performed at night or day time. This is most popular in Haryana. Its popularity can be gauged from the fact that for its showing there is no need of advertisement people will walk miles to witness a “Saang’. Pandit Deepchand can be called the originator of Haryanvi “Saang”.

2.3.6 Folk Songs: There are songs to suit all occasions in Haryana. Songs are sung mainly on festivals, and at the time of marriage. There is no activity of the people which has remained outside the preview of these songs. Ragni is famous song which is sung both by men as well women (Yadav 2002:286).

2.3.7 Urbanization in Haryana: Urbanization can be defined and measured as the percentage of the population classified as urban as opposed to rural within an area, region or a country. In other words urbanization is the number of urban dwellers divided by the total population. Urbanization is a process through which countries evolve from agrarian to industrial economies. In fact, the percentage of
a country’s urban population has long been used as a measure of that country’s level of economic development. In Haryana increase in urban population has occurred primarily through the shift in population from rural to urban areas and secondly through natural increase.

Table 2.4
Haryana: Urban Population and Growth

<table>
<thead>
<tr>
<th>Year</th>
<th>Urban Population (Percentage)</th>
<th>Growth during preceding decade</th>
</tr>
</thead>
<tbody>
<tr>
<td>1971</td>
<td>17.66</td>
<td>35.58</td>
</tr>
<tr>
<td>1981</td>
<td>21.88</td>
<td>59.49</td>
</tr>
<tr>
<td>1991</td>
<td>24.63</td>
<td>43.41</td>
</tr>
<tr>
<td>2001</td>
<td>28.92</td>
<td>50.82</td>
</tr>
<tr>
<td>2011</td>
<td>34.87</td>
<td>44.58</td>
</tr>
</tbody>
</table>


As Table 2.4 shows that up to the year 1971 there was not significant increase in urban population in Haryana. A remarkable increase in urban population was first registered after the decade 1971. In this decade the state made good progress in development of agriculture through green revolution which has altered the life line of the same. The effects of green revolution were far reaching. It has increased the per capita income of agrarian society consequently more population move in urban areas. As is evident from Table 2.4 after that a continuous increase in urban population has been registered in Haryana. For instance the percentage of urban population that was 24.63 at the time 1991 census reached to a level of 28.92 at the time of 2011 census. But a remarkable increase was recorded at the time of 2011 census when it registered ever highest 34.87 percent. More lucrative jobs pull and push factors attracted the people to settle in urban areas in Haryana over the years. On the other hand
side its growth rate that was registered a level of 59.49 at the time of 1981 census registered a decline in the next decade. But the growth rate of urban population further increased in the next decade. Table reflects the fact that the growth of urban population has showed up and down trends since the census year 1971 up to 2011.

2.4 Economy:

2.4.1 Agriculture: The mainstay of Haryana’s economy has always been agriculture. The state has given highest priority to agriculture even prior to the onset of green revolution resulting in the rise of food grain production. Thus, one of the youngest state of Indian Union soon became the fastest growing state, a vibrant testimony of what a long deprived people could achieve by determination, enthusiasm and hard work, when galvanized by strong and dynamic political leadership (Singh, 1977). The importance of agriculture in the economy of the state can be visualized from the fact that more than 60 percent of the people reside in the villages are engage in agricultural activities. The total geographical area of the state is very less compared to other big states, but its contribution in the central pool of food grain production with that of Punjab is higher than other states. The state has solved the food deficit problem of India. It has contributed to high agricultural productivity and production. But the predominant feature of agriculture is the wide variety of crops grown in the state and the predominance of the food grain crops over non-food grain crops. Basically there are two main cropping seasons in the state viz. Kharif (June-August to September) and the Rabi (October-November to April-May).

1. The Kharif Crops- The major kharif crops are bajra, maize, jowar, cotton, rice, and sugarcane, these are mainly cereals and coarse grain crops which are shown in the month of June and harvested in the late September. Most of south and south western parts of Haryana mainly grow bajra and jowar where as in other parts rice, sugarcane, and cotton are grown as main crops. Sometimes bajra, jowar and maize are grown as fodder crops for cattle’s.

2. The Rabi crops- Among the major Rabi crops wheat, gram, barley, and mustard are notable one. By for the most important crop wheat occupied the largest area under cultivation to total cropped from the other crops. Much of the
north and north eastern part of Haryana grow wheat and rice crops. Gram is
grown in the south and south-western part of the state. The Rabi crops are
seeding in the month of November and harvested in the month of March. Wheat
alone occupied the largest area under cultivation in the state the region behind
this fact is that it is one of the staple food crop in the region and most of the
population is vegetarian by habit.

2.4.2 Irrigation: The region receives rain only at the tail end of the
monsoon season. The amount of rainfall here is erratic as well as deficient in
character. So agriculture is essentially dependent on artificial resources e.g.
canals, wells, tube wells etc for irrigation. Before the onset of green revolution
the only and main sources of irrigation were wells and natural rainfall. The start
of green revolution in some where mid 1960s led to a new mechanism in the
history of irrigation. The onset of green revolution has innovated a modern
source of irrigation e.g. canal and tube wells. The expansion of area under these
two source of irrigation have engulfed a significant area of total cropped area
within a limited time in a significant way (please refer to chapter three and four).
But here it is also to be noted that the expansion of these sources have halted our
sustainability of agriculture in the post green revolution time. The land
dominated by canals irrigation is affected by the problems of water logging and
salinity, where as areas dominated by tube well irrigation are victim of water
depletion.

2.4.3 Cropping Intensity: The intensity of cropping refers to the number
of crops raised on a field during an agricultural year, or cropping intensity is
taken as the ratio (expressed as percentage) of gross cropped area to net sown
area. The cropping intensity of the state has increased in a considerable manner
with passage of time. This was only 142 percent at the time of triennium ending
1970-73 increased to a level of 152 percent by end of 1980-83. The remarkable
increase has been recorded in the successive year. For instance it was registered
a level of 176 and 180 percent at the triennium ending 2000-03 and 2005-08
respectively. The intervening years were also recorded increase under the same

2.4.4 Agriculture Research Institutions: The state is the path runner and
host of a number of national institutions e.g. The Central Soil Salinity Research
Institute (CSRI) and National Dairy Research Institute (NDRI) both are central
sponsored reputed institutions and located in Karnal city. The most significant milestone in the history of Indian agriculture was established by agricultural university of Hisar. This was established on 2 Feb. 1970 through an act of parliament. This university is charged with the responsibility to foster and promote integrated manner teaching, research programmes etc.

2.4.5 Industries: Haryana has a robust and one of the fast growing state in the country thank to green revolution and recent industrialization. Apart from agriculture, the National Capital Region (NCR) region has been the growth engine for the state rapid industrialization that has occurred over the last two decades. After the inevitable troubles, the state suddenly came alive with action. The entire length and breadth was soon throbbing with development activities which literally made the desert bloom. While irrigation and drinking water scheme quenched the thirst of millions of people, electrification of every village filled their life with a new energy. The perpetual deficit in food grains was soon converted into overflowing surpluses (Sharma 2005:93). Today, Haryana has 10102 ‘medium and large scale’ industries located mainly in Gurgoan, Panchkula, Faridabad, Panipat and in Rewari districts. The main industries are Maruti Udyog limited, Escorts, Hero-Honda, Soney, Whirlpool India, Bharti Telecom etc. In recent years, Haryana has emerged as one of the state of India with an impressive trail of achievement in the field of agriculture, business, tourism, information technology, automobile industry etc. As a result the state is counted in top most list among the rest of state of Indian union in matter of per capita income.

2.4.6 Agro-Industries: To meet the growing demand of farmers for agricultural machinery equipment, Tractors, Pumping sets, threshers, drills, harrows, etc the state government has established the state Agro-Industrial Corporation. The activities of the Haryana Agro-industries Corporation can be classified in to service activities, production activities, and commercial activities. Besides the above agro based units the corporation has established an agro engineering workshop at Nilokheri. There are 5 sugarmills in Haryana (one each located at Yamunanagar, Karnal, Panipat, Sonipat, and Rohtak). Sugar cane is one of the main crop of the state which provide raw material to sugar industry. Live stock enterprises and dairy development: Live stock enterprise forms an
important part of the agricultural system of Haryana. The total livestock population of the state is 90931. The state is the home of world famous Murrah buffalo. The Murrah buffalo leads all other breeds in milk production. This is the reason that Haryana is number one in matter of milk production. In addition the contribution of National Dairy Research Institute located at Karnal cannot be neglected. The NDRI Karnal provides improved variety of Murrah buffalo in the state. Haryana has rightly been called as a milk bowl of India.

2.4.7 Power Scenario in Haryana: Haryana state has always given high priority to the expansion of electricity infrastructure, because it is one of the most important inputs for the development of state. Haryana was the first state in the country to achieve 100% rural electrification of all its 6764 villages and 106 towns (according to 2001 census). Uchani village in Karnal district was the last village of Haryana that was electrified on 29th Nov.1970. The average installed generation capacity available to the state that was at low level of 290 mw at the triennium ending 1970-73 increased to 2642 mw by the time 2005-08. This was a remarkable and impressive development in this matter. The intervening years also registered an increase in this matter in a considerable manner. The average power available for sold that was at low level of 1946 million kilowatt hours at the triennium ending 1970-73 increased to level of 4615 by the triennium ending 1980-83. The successive years also registered a impressive increase in this matter. For instance by the triennium ending 2005-08 it registered a level of 13308 million kilowatt hours. the state that was 601.00 million K.W.H. in the year 1967-68 increased to 26465.60 million K.W.H. in the year 2007-08. Table 2.4 shows the power availability and installed generation capacity of electricity in the state and table 2.5 shows the power availability and per capita consumption of electricity in Haryana. The unit sold and the per capita consumption of electricity that was 10787 lakh K.W.H. and 106 K.W.H. in the triennium ending 1970-73 increased to 27775 lakh K.W.H in the next decade. It further registered an increase in this matter. For instance at the beginning of this presence century it reached to a level of 108238 lakh kilowatt hours. Both the table and figure shows that the state has made tremendous achievement not only in installed generation capacity but also in per capita consumption of electricity. The average unit sold as per capita electricity that was at low level of 106
kilowatt house at the time of triennium ending 1970-73 increased to 221 in 1980-83 and 425 kilowatt hours in the triennium ending 1990-93. In the coming years it has also recorded an increase. Haryana’s power sector has recently been restructured by establishing two separate government corporations.

1. Haryana Vidyut Prasaran Nigam Limited
2. Haryana Power Generation Corporation Limited

Earlier, the power sector was being managed by the state owned Haryana state electricity on 14th August 1998 under the provisions of Haryana electricity reforms act 1997.

The main power Generating stations of Haryana are-

1. Panipat Thermal power station
2. Faridabad thermal power station
3. WYC Hydro electric station Yamunanagar
4. Kakroi Micro-Hydel station

Table No 2.5
Power availability in Haryana

<table>
<thead>
<tr>
<th>Year</th>
<th>Installed Generation Capacity (in mw)</th>
<th>Power available for solds (in million K.W.H.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970-73</td>
<td>290</td>
<td>1946</td>
</tr>
<tr>
<td>1980-83</td>
<td>1150</td>
<td>4615</td>
</tr>
<tr>
<td>1990-93</td>
<td>1756</td>
<td>7385</td>
</tr>
<tr>
<td>2000-03</td>
<td>1779</td>
<td>6698</td>
</tr>
<tr>
<td>2005-08</td>
<td>2642</td>
<td>13308</td>
</tr>
</tbody>
</table>

Table No 2.6

Unit sold and per capita consumption of electricity in Haryana

<table>
<thead>
<tr>
<th>Year</th>
<th>Unit sold (Lakh K.W.H.)</th>
<th>Unit sold per capita(K.W.H.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970-73</td>
<td>10787</td>
<td>106</td>
</tr>
<tr>
<td>1980-83</td>
<td>27775</td>
<td>221</td>
</tr>
<tr>
<td>1990-93</td>
<td>256466</td>
<td>425</td>
</tr>
<tr>
<td>2000-03</td>
<td>108238</td>
<td>519</td>
</tr>
<tr>
<td>2005-08</td>
<td>121383</td>
<td>694</td>
</tr>
</tbody>
</table>


2.4.8 Transport Network in Haryana:

The state is well connected to every corner of the country by both roadways and railways. Haryana has average road length of 23729 km of metalled roads. Every village of the state is now linked with paved (Metalled) roads. The state government proposes to construct express highway and freeways
for speedier vehicular traffic. The government now encourages private sector investments in this sector for up-gradation of roads. The average road length maintained by public works department that was 12114 kilometer at the time of triennium ending 1970-73 increased to 22510 by end of 2005-08. After that period the average length of road has increase in Haryana. The average length of national highways and state highways that was 682 km and 9297 km in the triennium ending 1970-73 increased to 1220 km of national highways and 22510 km of state highways by the triennium ending.

Table 2.7 shows roads length in Haryana (please refer to Fig. 2.5 also). Haryana was the first state in India to introduce luxury video coaches’ buses. Haryana is also well connected on the rail network under the national capital region (NCR) scheme. There is already a proposal to provide rail corridor connecting towns around Delhi. The satellite town like Gurgaon is linked to metro also. Metro rail is being extended to other important cities of the state also.

Table No 2.7

<table>
<thead>
<tr>
<th>Year</th>
<th>National Highways</th>
<th>State Highways</th>
<th>Local bodies</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970-73</td>
<td>682</td>
<td>9297</td>
<td>2705</td>
<td>12114</td>
</tr>
<tr>
<td>1980-83</td>
<td>655</td>
<td>19366</td>
<td>*</td>
<td>20021</td>
</tr>
<tr>
<td>1990-93</td>
<td>656</td>
<td>22595</td>
<td>*</td>
<td>23251</td>
</tr>
<tr>
<td>2000-03</td>
<td>1351</td>
<td>22342</td>
<td>*</td>
<td>23568</td>
</tr>
<tr>
<td>2005-08</td>
<td>1220</td>
<td>22510</td>
<td>*</td>
<td>23729</td>
</tr>
</tbody>
</table>

Source: Statistical abstract of Haryana 1970-71 to 2008-09 and compiled by researcher.
Conclusion

The chapter present broad view of the study area it also put some light on it its every aspect viz. physical, economic, and social etc. It also prepared a desktop to reader before going to the next coming chapter and introduces the same about the above mentioned aspect. The chapter present demographic picture of the state and also introduce the reader about cultural aspects. The state has made some remarkable progress in every area of development after its making in the year 1966. The per capita income has improved over time and the state has made infrastructure development also as a result the state’s economy also improved. To sum up the study area will surly help the reader for understanding the coming chapter in a well illustrated way.


References


Singh Sukhdev (1977) “This Beautiful India Haryana” Light and life publication New Delhi, pp 30-46.
