CHAPTER 4
GROWTH OF SOCIO-ECONOMIC ATTRIBUTES

A study of the trends of growth in the socio-economic attributes of population and the changes in the spatial patterns associated with this growth is imperative for an understanding of the demographic character of a population. In urban areas, such a study derives its significance from the fact that the socio-economic character of urban population determines, to a great extent, the interaction between the nature and level of urban amenities available in a town and the quality or standard of living of its population. This, in turn, finds spatial expression in the morphology, landuse patterns and the functional character of towns.

In case of planned towns like Chandigarh, the infrastructure required for the proposed function is estimated and provided for in the Master Plan. It includes provisions of land and buildings for various uses—residence, recreation, work and circulation (1). Needless to say, such planning provisions vary according to the functional character of the town being planned. Thus, in the planned towns, the planning provisions, particularly those related to housing and infrastructural facilities, act as a major determinant of the demographic character of population.

The towns with predominantly administrative function have traditionally been associated with such socio-economic attributes as high population density, low sex ratio, high rates of literacy, high proportion of workers, and a substantial Scheduled Castes population (2). Some of these broad generalizations are expected to hold true for Chandigarh, which is a triple administrative unit.

By virtue of being a planned city, the basic ground plan, landuse, housing and other facilities in Chandigarh were pre-planned. The resident population was, thus, expected to fit into the physical frame created under the plan proposals. Since the socio-economic characteristics of a population are not static, the dynamics of population growth has implications in terms of the flexibility and viability of the plan proposals.

Further, since its inception about four decades ago, Chandigarh has evolved into a multifunctional city. The physical and economic proximity to Chandigarh has promoted industrial and other activities in the surrounding region. The expansion of the
city and the evolution of its functional base is expected to influence the socio-economic profile of the city.

**Methodology and Sources of Data**

This chapter focuses on the growth in the following socio-economic characteristics of the population of Chandigarh city – density, sex ratio, literacy, workforce and Scheduled Castes population (3). The decadal growth rate for these attributes for every Sector has been calculated for three decades, 1961-71, 1971-81 and 1981-91. To maintain objectivity, the growth rate values are grouped into quartile categories to identify areas of very high, high, low and very low growth. Wherever the number of Sectors recording a negative decadal growth rate is adequate, categories have been formed to identify areas of negative growth. In addition, the distribution pattern of each attribute in 1961 and 1991 has also been described. The former provides the base, and the latter shows the pattern of distribution after the city's evolution since 1961. Further, multi-collinearity has been calculated in order to understand the associations between the spatial patterns of population growth and the socio-economic attributes.

The data for this chapter have been taken from the District Census Handbooks for Chandigarh, published by the Census of India for 1971, 1981 and 1991; the data for 1961 has been taken from the District Census Handbook for Ambala district.

The chapter begins with a brief note on the general attributes of the trends in the growth in socio-economic characteristics of the population of Chandigarh since 1961. This is followed by a detailed discussion of the spatial patterns of growth of the five socio-economic attributes in the city over the three decades. The general trends in the growth of the socio-economic characteristics of the population of Bhubaneswar and Gandhinagar have also been briefly highlighted to present a comparative picture of the three modern planned state capitals.

**GENERAL TRENDS AND ASSOCIATIONS**

The characteristics of the growth of population in Chandigarh have already been described in the previous chapter. Briefly re-enunciated, these are: (i) the population of Chandigarh city registered an absolute increase of 421,244 persons or 471.60 per cent growth during 1961-91; (ii) the per cent decadal rates of growth of population during the
three individual decades (144.89, 73.56 and 34.47 per cent during 1961-71, 1971-81 and 1981-91 respectively) reveal a deceleration in the rates of growth of population, and (iii) inspite of registering successively lower decadal growth rates, the increase in population, in terms of absolute numbers added during various decades, continued to be substantial.

Between 1961 and 1991, the density of population in the city increased by 4518 persons per sq. km, from 2819 in 1961 to 7333 persons per sq. km in 1991. This increase was inspite of the increase in the area of the city from 31.68 sq. km in 1961 to 69.63 sq. km in 1991. While the increase in area was mainly due to the development of seventeen Phase II Sectors, the increase in density of population was as much related to the infilling of older Sectors as to the settlement of new ones.

The sex ratio of Chandigarh city increased substantially from 625 females per 1000 males in 1961 to 817 females per 1000 males in 1991, a growth of 192 females per 1000 males (Table 11). In comparison, India's sex ratio in 1991 was 929 females per 1000 males.

The literate population in the city registered a growth of 563.19 per cent or an absolute increase of 304,705 literate persons during 1961-91. This rate of growth was higher than that of the total population (471.6 per cent) during the same period, and reflected the administrative status of the city as well as its role as a major educational centre. In 1961, the literates in the city constituted 60.53 per cent of its total population; this proportion increased to 70 per cent in 1991 (Table 11).

As compared to the growth in the literate population, the growth in workforce in the city was low (396.68 per cent) or an addition of 139,537 workers during 1961-91. In 1961, the city had 35,149 persons registered as workers, forming 39.35 per cent of the total population. In 1991, this proportion was 34.0 per cent. In fact, from 1971 onwards, the proportion of workers has remained around one-third of the city's population (Table 11). The low proportion of workers is associated mainly with family-type migration promoted by a congenial living environment, and a large resident student population.

The Scheduled Castes population, which forms an important segment of the workforce in urban places, increased by 73,519 persons or by 967.73 per cent during 1961-91. In 1961, only 7,597 persons (8.5 per cent of the total population) were registered as Scheduled Castes. In 1991, their number had increased to 81,116 persons
forming 15.88 per cent of the total population (Table 11). Initially, this segment of the population was attracted to the city by employment available in construction activities.


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<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Growth of Population (per cent)</td>
<td>471.60</td>
<td>144.89</td>
<td>73.56</td>
<td>34.47</td>
</tr>
<tr>
<td></td>
<td>(218743 persons)</td>
<td>(379660 persons)</td>
<td>(510565 persons)</td>
<td>(510565 persons)</td>
</tr>
<tr>
<td>Density of Population (persons/ sq.km.)</td>
<td>4514</td>
<td>1868</td>
<td>1801</td>
<td>845</td>
</tr>
<tr>
<td></td>
<td>(4687)</td>
<td>(4687)</td>
<td>(6488)</td>
<td>(7333)</td>
</tr>
<tr>
<td>Sex-Ratio (females per thousand males)</td>
<td>192</td>
<td>127</td>
<td>28</td>
<td>37</td>
</tr>
<tr>
<td></td>
<td>(752)</td>
<td>(752)</td>
<td>(780)</td>
<td>(817)</td>
</tr>
<tr>
<td>Literacy (per cent)</td>
<td>563.19</td>
<td>168</td>
<td>79</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td>(66.3)</td>
<td>(66.3)</td>
<td>(68)</td>
<td>(70)</td>
</tr>
<tr>
<td>Workforce (per cent)</td>
<td>396.68</td>
<td>108</td>
<td>80.7</td>
<td>34</td>
</tr>
<tr>
<td></td>
<td>(33.3)</td>
<td>(33.3)</td>
<td>(35)</td>
<td>(34)</td>
</tr>
<tr>
<td>Scheduled Castes Population (per cent)</td>
<td>967.73</td>
<td>182.83</td>
<td>123.29</td>
<td>69.06</td>
</tr>
<tr>
<td></td>
<td>(9.82)</td>
<td>(9.82)</td>
<td>(12.63)</td>
<td>(15.88)</td>
</tr>
</tbody>
</table>

Note:— Figures in parentheses refer to proportions / values at the end of the decade.


<table>
<thead>
<tr>
<th>Attributes</th>
<th>1961-71</th>
<th>1971-81</th>
<th>1981-91</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density of Population (persons/ sq.km.)</td>
<td>+0.71</td>
<td>+0.56</td>
<td>+0.90</td>
</tr>
<tr>
<td></td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
</tr>
<tr>
<td>Sex Ratio (females per thousand males)</td>
<td>+0.45</td>
<td>+0.04</td>
<td>+0.52</td>
</tr>
<tr>
<td></td>
<td>(0.02)</td>
<td>(NS)</td>
<td>(0.001)</td>
</tr>
<tr>
<td>Literacy (per cent)</td>
<td>+0.97</td>
<td>+0.94</td>
<td>+0.92</td>
</tr>
<tr>
<td></td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
</tr>
<tr>
<td>Workforce (per cent)</td>
<td>+0.95</td>
<td>+0.94</td>
<td>+0.85</td>
</tr>
<tr>
<td></td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
</tr>
<tr>
<td>Scheduled Castes Population (per cent)</td>
<td>+0.44</td>
<td>+0.64</td>
<td>+0.48</td>
</tr>
<tr>
<td></td>
<td>(0.02)</td>
<td>(0.001)</td>
<td>(0.001)</td>
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</tbody>
</table>

Note:— 1. Figures in parentheses indicate level of confidence  
2. N.S.: Not significant
As the city developed, employment in domestic and informal sectors acted as additional factors in prompting an increase in the Scheduled Castes population in the city. Interestingly, employment in government service has not been a major contributing factor in the growth of the Scheduled Castes population, and has played only a limited role in determining their areal concentration in the city.

Since the entire process of growth of population in Chandigarh has operated within the framework formed by the planning provisions, it is expected that (i) the trends in the growth of population will also be discernible in the growth in socio-economic attributes, and that (ii) there will be a strong association between (a) the spatial patterns of growth of population and those of socio-economic attributes, and (b) the spatial patterns of growth of different socio-economic attributes.

The trend of successively lower rates of population growth in Chandigarh has already been noted. A similar observation can also be made for the growth of socio-economic attributes of population, except sex ratio (Table 11). Contrary to the general trend, sex ratio registered a higher increase during 1981-91 as compared to the previous decade. This could possibly be associated with the development of new Sectors during 1971-81, which attracted more male workers, particularly in construction activities and also single male households, due to an initial lack of family-type housing in these Sectors. However, once the housing in these Sectors had developed, particularly family-type housing, the sex ratio improved.

The association between spatial patterns of population growth and those of socio-economic attributes during the three decades can be identified from Table 12. The correlation values in Table 12 support the observation that the spatial patterns of population growth in the city are significantly reflected in the growth of socio-economic attributes of population, since whatever be the degree of correlation, in most cases it is significant at a very high level of confidence. Interestingly, although the correlation between population growth, literacy and workforce continues to be very high and very significant, it has become comparatively weak over the decades. On the other hand, the correlation between population growth, population density, sex ratio and growth of Scheduled Castes population has become stronger and significant. This indicates the changes in the demographic character of the city that have accompanied its growth.
The correlation values in Table 12 also adequately support the observation about the impact of the development of new Sectors on different socio-economic attributes of the city during 1971-81. Specifically, the correlation between population growth and that of sex ratio is not only weak but insignificant; with population density, it is significant, but far weaker as compared to the previous decade; with workforce, it is almost as strong and significant as during the previous decade, and with growth in Scheduled Castes population, it is far stronger as compared to the preceding as well as the following decade.

The rank correlation values and the levels of confidence between various socio-economic attributes for Chandigarh during 1961-71, 1971-81 and 1981-91 are given in Tables 13, 14 and 15 respectively. For a better understanding, these tables also include the values for population growth, already given in Table 12.

### TABLE 13: CHANDIGARH CITY: MULTI-COLLINEARITY OF SOCIO-ECONOMIC ATTRIBUTES OF POPULATION (1961-71)

<table>
<thead>
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</tr>
</thead>
<tbody>
<tr>
<td>Population Growth</td>
<td>-</td>
<td>+0.71 (0.001)</td>
<td>+0.45 (0.02)</td>
<td>+0.97 (0.001)</td>
<td>+0.95 (0.001)</td>
<td>+0.44 (0.02)</td>
</tr>
<tr>
<td>Population Density</td>
<td>-</td>
<td>+0.08 (N.S.)</td>
<td>+0.70 (0.001)</td>
<td>+0.77 (0.001)</td>
<td>+0.27 (N.S.)</td>
<td></td>
</tr>
<tr>
<td>Sex Ratio</td>
<td>-</td>
<td>-</td>
<td>+0.41 (0.05)</td>
<td>+0.33 (0.1)</td>
<td>+0.14 (N.S.)</td>
<td></td>
</tr>
<tr>
<td>Literacy</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>+0.92 (0.001)</td>
<td>+0.42 (0.05)</td>
<td></td>
</tr>
<tr>
<td>Workforce</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>+0.41 (0.02)</td>
<td></td>
</tr>
<tr>
<td>Sch. Castes Population</td>
<td>-</td>
<td>-</td>
<td>-</td>
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</tbody>
</table>

Note:- 1. Figures in parentheses indicate level of confidence
       2. N.S. : Not significant
### TABLE 14: CHANDIGARH CITY: MULTI-COLLINEARITY OF SOCIO-ECONOMIC ATTRIBUTES OF POPULATION (1971-81)

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</tr>
</thead>
<tbody>
<tr>
<td>Population Growth</td>
<td>-</td>
<td>+0.56 (0.001)</td>
<td>+0.04 (N.S.)</td>
<td>+0.94 (0.001)</td>
<td>+0.94 (0.001)</td>
<td>+0.64 (0.001)</td>
</tr>
<tr>
<td>Population Density</td>
<td>-</td>
<td>-0.09 (N.S.)</td>
<td>+0.58 (0.001)</td>
<td>+0.50 (0.001)</td>
<td>+0.22 (N.S.)</td>
<td></td>
</tr>
<tr>
<td>Sex Ratio</td>
<td>-</td>
<td></td>
<td>+0.13 (N.S.)</td>
<td>-0.20 (N.S.)</td>
<td>-0.16 (N.S.)</td>
<td></td>
</tr>
<tr>
<td>Literacy</td>
<td>-</td>
<td></td>
<td></td>
<td>+0.84 (0.001)</td>
<td>+0.21 (N.S.)</td>
<td></td>
</tr>
<tr>
<td>Workforce</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td>-0.44 (0.01)</td>
<td></td>
</tr>
<tr>
<td>Sch.Castes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Population</td>
<td></td>
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</tbody>
</table>

Note: 1. Figures in parentheses indicate level of confidence  
2. N.S.: Not significant

### TABLE 15: CHANDIGARH CITY: MULTI-COLLINEARITY OF SOCIO-ECONOMIC ATTRIBUTES OF POPULATION (1981-91)

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</tr>
</thead>
<tbody>
<tr>
<td>Population Growth</td>
<td>-</td>
<td>+0.90 (0.001)</td>
<td>+0.52 (0.001)</td>
<td>+0.92 (0.001)</td>
<td>+0.85 (0.001)</td>
<td>+0.48 (0.001)</td>
</tr>
<tr>
<td>Population Density</td>
<td>-</td>
<td>+0.42 (0.01)</td>
<td>+0.86 (0.001)</td>
<td>+0.76 (0.001)</td>
<td>+0.50 (0.001)</td>
<td></td>
</tr>
<tr>
<td>Sex Ratio</td>
<td>-</td>
<td></td>
<td>+0.55 (0.001)</td>
<td>+0.33 (0.05)</td>
<td>+0.40 (0.01)</td>
<td></td>
</tr>
<tr>
<td>Literacy</td>
<td>-</td>
<td></td>
<td></td>
<td>+0.82 (0.001)</td>
<td>+0.45 (0.001)</td>
<td></td>
</tr>
<tr>
<td>Workforce</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td>+0.34 (0.02)</td>
<td></td>
</tr>
<tr>
<td>Sch.Castes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Population</td>
<td></td>
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Note: Figures in parentheses indicate level of confidence

Broadly, the multi-collinearity among various socio-economic attributes during the three decades follows the pattern already identified in Table 12 – for some attributes such as growth in density, literacy and workforce, the correlations are positive, strong and
significant at a very high level of confidence. In comparison, for sex ratio and Scheduled Castes population, these vary from one decade to another (Tables 13, 14 and 15). The possible reason could be that the growth in sex ratio is in response to the availability of conducive residential and infrastructural environment, and the growth in Scheduled Castes population is traditionally related to the availability of employment. In both cases, conditions conducive to their growth may not necessarily accompany the growth in total population, at least in the initial stages of the development of a city, as in the case of Chandigarh. It is only during the last decade that all the socio-economic attributes exhibit a uniform, positive, strong and significant multi-collinearity (Tables 13, 14 and 15). In this sense, Chandigarh can be said to have reached maturity as a city.

During 1961-71, sex ratio had a weak and insignificant relationship with density of population, indicating the concentration of families in only a few areas. The correlation between growth in sex ratio and that of Scheduled Castes population was also weak and insignificant. In comparison, the correlations between growth in sex ratio and literacy and workforce were far stronger and significant (Table 13). These stronger correlations were on expected lines, since during this decade of the city’s development, the bulk of the population comprised of government / institutional service employees and their families.

The next decade, 1971-81, was both an important and an exceptional decade. It was important because during this decade, the Phase II Sectors started developing and were appended to the fairly well developed Phase I Sectors. This introduced an element of dynamism in the growth of the city, since the Phase II Sectors were planned to house a much larger population as compared to the Phase I Sectors. This was an exceptional decade because the development of Phase II Sectors as well as infilling in Phase I Sectors introduced some aberrations in the trends of growth of socio-economic attributes of population. Expectedly, growth in sex ratio and Scheduled Castes population showed weaker and negative correlations with other socio-economic attributes during this decade as compared to the previous decade (Tables 13 and 14). While the correlation of sex ratio with population growth and literacy was weak and insignificant, it was negative with density, workforce and Scheduled Castes population. The growth in Scheduled Castes population had the highest, positive, strong and significant correlation with
population growth during 1971-81. The same was true of its correlation with growth in workforce (Table 14). However, the correlation between Scheduled Castes population and growth in density and literacy was weak and insignificant, with sex ratio. it was negative.

The decade 1981-91 can be considered as a decade of maturing of the city and of having attained a somewhat balanced socio-economic character. The growth of population was strongly, positively and significantly correlated with the growth of all the socio-economic attributes of population (Table 15). At the same time, the growth of various socio-economic attributes had positive and significant multi-collinearity with each other.

In view of the fact that different Sectors in the city started developing at different times, and, depending upon the nature and level of planned infrastructure, particularly housing and its associated facilities, were at different stages of settlement at any given point in time, for example, at the close of a decade, it is axiomatic that different parts of the city would register different rates of growth in the socio-economic attributes of population. A description of the spatial patterns of growth of socio-economic attributes in different Sectors of the city during the three decades, 1961-71, 1971-81 and 1981-91, is given below.

1. DENSITY OF POPULATION

Population density is simply defined as the ratio between the number of persons and an unit of area. It is an indicator of human pressure on land, and in urban areas, the pressure on the housing stock and infrastructure. It also reflects the locational advantages of an area in the overall functioning and ecological growth of towns. Density has immense qualitative implications in terms of standards of living and the morphological and functional attributes of an urban area.

The plan proposals for Chandigarh were based on three broad population density levels, 25, 50 and 75 persons per acre (6177, 12355 and 18532 persons per sq. km) for low, middle and high density areas respectively. These were also specified in accordance with the functional characteristics of various Sectors and the economic and functional status of their residents. For instance, Sectors 2 to 5 were planned to house
CHANDIGARH CITY
Density Patterns: 1961
(Data by Sectors)

Persons/Km$^2$

- 2925
- 1391
- 915

City average: 2819 persons/Km$^2$

Fig. 28
high ranked government employees in large-sized plots (2 to 8 \textit{kanals} or 1000 to 4000 sq. yards). Consequently, fairly low densities of less than 2000 persons per sq. km. were proposed for these Sectors. In comparison, Sectors 20,21,22,23 and 27 were to contain mainly small sized plots of upto 7.5 \textit{marlas} (112.5 sq. yards) to house lower ranked government employees. The planned densities for these Sectors were, therefore, high – 13,000 to 21,000 persons per sq. km. Similarly, the seventeen Phase II Sectors, numbers 31 to 47, were planned to accommodate about 70 per cent of Chandigarh’s estimated 5 lakh persons, thereby implying a high density of population as well as intensity of development. The provisions under Frame Control regulations were intended to regulate the intensity of construction as well as the consequent population densities and ensure a better living environment.

However, despite these measures, Chandigarh U.T. had a density of 5,632 persons per sq. km., the second highest among the UTs in India in 1991. The density of Chandigarh City was even higher, 7333 persons per sq. km. Between 1961 and 1991, the density of population in the city increased by 4518 persons per sq. km. In fact, the population density of Chandigarh since its establishment has been fairly high, 2819, 4687 and 6488 persons per sq. km. in 1961, 1971 and 1981 respectively. The density growth rates have been 1868, 1801 and 845 persons per sq. km. during 1961-71, 1971-81 and 1981-91 respectively (Table 11).

\textbf{Density Patterns (1961)}

At the time of the first census of the city in 1961, Chandigarh had a density of 2819 persons per sq. km. It varied between 10322 and 13 persons per sq km. in Sectors 22 and 29 respectively. On the basis of the levels of density in different Sectors in 1961 four types of areas can be identified (Fig.28):

(i) Areas of Very High Density (More than 2925 persons per sq. km.)
(ii) Areas of High Density (From 1391 to 2925 persons per sq. km.)
(iii) Areas of Low Density (From 915 to 1391 persons per sq. km.)
(iv) Areas of Very Low Density (Less than 915 persons per sq. km.)

\textit{i) Areas of Very High Density (More than 2925 persons per sq. km.)}

This category comprises of Sectors 22,20,23,27,19,14 and 7 in order of their density values which varied between 10322 and 3416 persons per sq. km. in Sectors 22
and 7 respectively. All the Sectors in this category were proposed as either high (numbers 22,20) or medium (numbers 23,27,19,14,7) density Sectors. Further, these Sectors were among the first to develop in the city. While Sector 14 comprised the Panjab University and its campus, the other Sectors in this category developed with small sized government and private plots.

ii) Areas of High Density (From 1391 to 2925 persons per sq. km.)

This category comprises of Sectors 15,16,18,24,21,30,8 and 12. The density values in this category varied between 2435 and 1391 persons per sq. km. in Sectors 15 and 12 respectively. All of these adjoin areas of very high density (Fig.28). These Sectors had different types of housing, private in Sectors 18, 21 and 8, mixed in Sectors 15 and 16 and mainly institutional in Sectors 24, 30 and 12. All the Sectors in this category, except Sectors 16 and 12, were proposed as medium density areas. Sectors 16 and 12 were planned as low density areas.

iii) Areas of Low Density (From 915 to 1391 persons per sq. km)

This category comprises of Sectors 11,2,4,5,26,17 and 6. The density values amongst these varied between 1344 and 926 persons per sq. km. in Sectors 11 and 6 respectively. These Sectors were planned as low density areas with institutional or public functions and have restricted housing.

iv) Areas of Very Low Density (Less than 915 persons per sq. km.)

This category comprises Sectors 10,9,25,3,1,28 the Industrial Area and Sector 29. All these Sectors, except Sectors 10 and 9, have a peripheral location in the city (Fig.28). The density values among these varied between 904 and 13 persons per sq. km. in Sectors 10 and 29 respectively. Among these Sectors, numbers 10,9,3 and 1 occur as a contiguous area and were planned as low density, high income group areas. Sector 25, located adjacent to the University on the western periphery of the city and reserved for university housing, was proposed as a medium density area. However, in 1961, it was undeveloped except for a few slums and squatter settlements. Sector 28 and 29, located adjacent to the Industrial Area on the eastern periphery of the city, were reserved for industrial housing. Sector 28 was proposed as a high density area and Sector 29 as a medium density area.
CHANDIGARH CITY
Growth in Density
1961-71
(Data by Sectors)

Figures outside the circle indicate persons per sq km
City average: 1868 persons/Km²
In 1961, the density levels in different Sectors of the city were mainly related to the stage of development of a Sector and the nature of housing provided in it. Broadly, the spatial patterns of density conformed to the general pattern of higher densities in developed Sectors and lower densities on the peripheries which had not developed sufficiently.

**Growth in Density (1961-71)**

The high growth in population density (1868 persons per sq. km.) in the city during 1961-71 may be attributed to, firstly, an early start in the settlement of the city characterized by a small base of population at the beginning of the decade, secondly, the merger of PEPSU state (East Punjab and Patiala States Union) with Punjab in 1956, and the Reorganization of Punjab in 1966 which made Chandigarh a headquarter of three administrations, resulting in an increase in the number of government employees to be stationed in the city. Among the various Sectors in the city, the growth in density varied between 13,380 persons per sq. km. in Sector 20, having predominantly public housing for government employees, and 315 persons per sq. km. in Sector 5, a low density high income group area. Generally, comparatively higher rates of growth in density were registered in Sectors located successively towards the south of the city (Fig. 29).

Four types of areas can be identified on the basis of the decadal growth in population density:

(i) **Areas of Very High Growth** (More than 5478 persons per sq. km.)
(ii) **Areas of High Growth** (From 2749.51 to 5478 persons per sq. km.)
(iii) **Areas of Low Growth** (1267 to 2749.51 persons per sq. km.)
(iv) **Areas of Very Low Growth** (Less than 1267 persons per sq.km.)

i) **Areas of Very High Growth (More than 5478 persons per sq. km.)**

This category comprises of Sectors 20,22,21,15,27,28 and 23 in order of their growth rate in density. The highest change among the Sectors in this category was recorded in Sector 20 (13,380 persons per sq. km.) and the lowest in Sector 23 (5,479 per sq. km.). These Sectors roughly form a crescent, starting from Sectors 27 and 28 located in the east to Sectors 20,21,22,23 forming the southern limit of the city, to Sector 15 located in the west (Fig.29). These Sectors were planned either as high (Sectors 20,22,28) or medium density Sectors (numbers 21,15,27,23) with small-sized plots,
irrespective of the type of housing. The development of industrial housing in Sector 28, and the central location of Sector 15 to such institutional Sectors as numbers 14, 12 and 11 also contributed to their high growth in density. The actual density values of Sectors 20, 22, 27 and 23 exceeded their planned density levels in 1971 by 2163, 1221, 4054 and 409 persons per sq. km. respectively.

ii) *Areas of High Growth (From 2749.51 to 5478 persons per sq. km.)*

This category comprises of Sectors 24, 18, 8, 29, 19 and 25. All of these are located adjacent to areas of very high growth in density and were planned to have medium densities (Fig. 29). The growth in density in these varied between 5368 and 2775 persons per sq. km. in Sectors 24 and 25 respectively. The high growth in density may be related to the early development of housing and associated infrastructure, especially in Sectors 24, 18, 8, 29 and 19. In comparison, Sector 25, reserved for university housing, attracted slums and squatter settlements due to its peripheral location and the lack of any immediate plans for its development. This Sector had a low density in 1961, but emerged as an area of high density in 1971.

iii) *Areas of Low Growth (From 1267 to 2749.51 persons per sq.km.)*

This category includes Sectors 7, 11, 16, 12, 10, 30 and 14 in order of their growth in density. The growth values varied between 2724 and 1267 persons per sq. km. in Sectors 7 and 14 respectively. Sectors 7, 30 and 14 were proposed as medium density areas and Sectors 11, 16, 12 and 10 as low density areas. Excluding Sectors 7 and 16, institutional housing is a common feature in these Sectors either wholly (numbers 12, 14, 30) or in part (numbers 11 and 10). Sectors 7 and 16, which developed with private as well as public housing, recorded a high growth in density within this category.

iv) *Areas of Very Low Growth (Less than 1267 persons per sq. km.)*

All the Sectors in this category, numbers 9, 2, 26, 4, 3 and 5, were planned as low density areas. The growth in density varied between 987 and 315 persons per sq. km. in Sectors 9 and 5 respectively. Sectors 2, 3, 4 and 5 comprise the northern limits of the city (Fig. 29). Excluding Sector 26, the other five Sectors developed with large sized plots as high income group areas. In Sector 26, located on the north-eastern periphery of the city and planned to house the wholesale market and goods transport functions, the very low growth in density may be related to the low level of development of this function during
CHANDIGARH CITY
Growth in Density
1971-81
(Data by Sectors)

Persons/Km²

6505
2022
837

Enumerated for the first time in 1981
Figures outside the circle indicate persons per sq km
City average: 1801 persons/Km²

Boundaries
Town
Sector
Sector number
Census town
Out growth

Fig. 30
this decade. Similarly, in the Industrial Area (Phase I), the very low growth in density (145 persons per sq. km.), could be associated with the initial low industrial development of the city.

Three Sectors, 17, 1 and 6, registered a decline in density by 491,581 and 881 persons per sq. km. respectively during 1961-71. These Sectors, institutional in function, were proposed as low density areas with restricted housing facilities.

During this decade, an inverse relationship between density values in 1961 and its rate of growth during 1961-71 was observed in eight out of the twenty-nine Sectors in the city. Five Sectors recorded high density values at the beginning of the decade, but registered a low growth in density during the decade. Three of these five Sectors had institutional housing. In comparison, three Sectors had low density values in 1961, but recorded a high growth during 1961-71. In addition, ten Sectors recorded high density values in 1961 as well as high growth during 1961-71. Most of these Sectors were among the first to be developed in Chandigarh, and had small sized plots. On the other hand, eleven Sectors registered low density values in 1961 and also recorded low or negative change in density during 1961-71. These included high income low density Sectors located towards the north of the city, and specific institutional areas such as the Capitol Complex, the City Centre and the Wholesale Market.

**Growth in Density (1971-81)**

During this decade, the city registered an increase in its population density by 1801 persons per sq. km., from 4687 to 6488 persons per sq. km. in 1971 and 1981 respectively. The highest change in density occurred in the new Phase II Sectors, located along the southern limits of the city in 1981 (Fig.30). In comparison, inspite of a comparatively lower growth in their densities, the density values in seventeen Phase I Sectors exceeded their proposed levels in 1981. The vitality of this decade may be associated with (i) the development of nine new Phase II Sectors (numbers 31 to 38 and 47) and the Second Phase Industrial Area, and (ii) expansion of the existing housing facilities in the Phase I Sectors.

On the basis of the decadal variations in the growth of population density during 1971-81, four types of areas can be identified in the city (Fig.30):

(i) Areas of Very High Growth (More than 5054 persons per sq. km.)
(ii) Areas of High Growth (From 2022 to 5054 persons per sq. km.)
(iii) Areas of Low Growth (From 837 to 2022 persons per sq. km.)
(iv) Areas of Very Low Growth (Less than 837 persons per sq. km.)

i) Areas of Very High Growth (More than 5054 persons per sq. km.)

This category comprises of Sectors 37,35,30,47,7, 29,15,38 and 31 in order of their growth in density. The highest increase in density was registered in Sector 37 (11205 persons per sq. km.) and the lowest in Sector 31 (5242 persons per sq. km.) Sectors 29,30,31 and 47, located in the eastern part of the city, comprised the major area of high increase in density during this decade (Fig.30). Another major area comprised of Sectors 37 and 38 to the south of the city. The five newly developed Phase II Sectors, 37,35,47,38 and 31, in this category also recorded a high population growth during this decade. The high growth in density in these was associated with a low population base in 1971, the presence of mainly private housing, the provision of EWS housing in Sectors 37 and 38, and housing for defence personnel in Sectors 31 and 47. Further, except Sector 31, all these Sectors were planned as high density areas.

Four Phase I Sectors, numbers 30,7,29 and 15 also registered very high growth in density. This may be attributed to the expansion of housing within these Sectors, especially the addition of EWS housing in Sectors 29 and 30, and to the expansion of existing institutions and associated housing (CSIO, RBI, ISTC) in Sector 30. The densities of Sectors 30,7 and 15 exceeded their planned targets in 1981.

ii) Areas of High Growth (From 2022 to 5054 persons per sq. km.)

This category includes Sectors 26,32,22,20,21,33,34,23,24 and 28 in order of their growth in density which varied between 4867 and 2022 persons per sq. km. in Sectors 26 and 28 respectively. With the exception of Sectors 26 and 28, all the Sectors in this category constitute one contiguous block in the southern part of the city (Fig.30). Within this block, Sectors 32,33 and 34, enumerated for the first time in 1971, were planned as medium density areas. The predominance of small sized plots and government housing in Sectors 22,20,21 and 23 promoted an intensive development in these Sectors. Most of these were planned as high density areas, and in 1981 registered some of the highest density values in Chandigarh, for example, Sectors 20 and 22, with 27,309 and 24,646 persons per sq. km. respectively, had the highest and second highest
densities in the city. The density values of all these Sectors also exceeded their planned levels in 1981. However, it needs to be pointed out that during 1971-81, these Sectors registered lower rates of growth in density as compared to the previous decade. This conforms to the already observed trend of initial rapid growth, followed by decelerating growth, which in turn gives way to a decline in the succeeding decade. Sectors 22, 20, 21 and 23 registered negative growth during 1981-91.

In Sector 26, housing the wholesale market and goods transport area, the proliferation of this function during this decade, and the development of slums and squatter settlements due to its peripheral location contributed to the high growth in density. Its density in 1981 (6,481 persons per sq. km) was far in excess of its planned density level (1,626 persons per sq. km.).

iii) Areas of Low Growth (From 837 to 2,021 persons per sq. km.)

This category includes Sectors 8, 11, 25, 36, 16, 18, 10, 19, 27, the Industrial Area, Sectors 17 and 12 in order of their growth in density. The growth in density in this category varied between 1693 and 837 persons per sq. km. in Sectors 8 and 12 respectively. Among these, Sectors 8, 18, 19 and 27 form a large contiguous area of low growth in the north-east. A similar area is formed by Sectors 10, 11, 16 and 12 in the north-west (Fig.30). Along with Sector 25, all of these belong to Phase I of Chandigarh’s development. The only Phase II Sector in this category, Sector 36, occurs as an isolated patch surrounded by areas of higher growth (Fig.30). It was planned as a low density area with private housing. The Phase I Sectors in this category, Sectors 8, 11, 25, 16, 18, 10, 19, 27 and 12 recorded a lower growth in density during this decade as compared to the previous decade. Inspite of this apparent inertia, Sectors 11, 16, 25, 27, 7 and 12 exceeded their planned density levels in 1981, indicating a possible saturation of housing facilities in these Sectors. In fact, in the succeeding decade, many of these Sectors were to register negative rates of growth in density.

Sector 17, the City Centre, which had registered a decline by 491 persons per sq. km. during the previous decade, recorded a growth by 868 persons per sq. km. The initial decline and subsequent growth were related to temporary developments. The Industrial Area (Phase I and II) recorded a considerably higher growth in density during this decade (1261 persons per sq. km.) as compared to the previous decade (145 persons
per sq. km.). This growth was related mainly to the development of the Second Phase Industrial Area.

iv) Areas of Very Low Growth (Less than 837 persons per sq. km.)

This category comprises of Sectors 14,5,9,6,4,3 and 1 in order of their rate of growth in density which varied between 583 persons per sq. km. in Sector 14 and 7 persons sq. km. in Sector 1. These Sectors occur as a contiguous belt on the northern margins of the city, with two southward extensions formed by Sectors 14 and 9 (Fig.30). All the Sectors in this category are either institutional or low density high income group areas with a predominance of private housing. The low growth in population density in all these Sectors, excluding Sectors 1 and 6, corresponded to the low population growth registered during this decade. In Sectors 1 and 6, housing the Capitol Complex and the Governors’ Residences respectively, the high population growth during this decade was associated with temporary developments. However, the low growth in density was due to a small population residing in a large area. During this decade, only Sector 2, planned as a low density Sector with large sized plots, registered a decline in its population density by 214 persons per sq. km.

An inverse relationship between the population density values at the start of the decade and the growth in density during the decade was observed in eighteen out of the thirty-eight Sectors in the city. Out of these eighteen Sectors, nine had a high population density in 1971, but registered a low growth during 1971-81. Six of these Sectors were medium density areas with private and government housing; the remaining three were institutional areas. An additional nine Sectors had a low population density in 1971, but registered very high growth in density during the decade. All of these Sectors, excluding Sector 26, were new Phase II Sectors enumerated for the first time in 1971.

In addition to the eighteen Sectors mentioned above, ten had a high population density in 1971 and also recorded a high growth in density during 1971-81. All these Sectors were proposed as high density areas; seven of them exceeded their planned densities in 1981. Another ten Sectors had a low population density in 1971 and also recorded a low growth in density during 1971-81. All these Sectors were proposed as low density areas. Included in this group were high income group Sectors located to the north of the city (numbers 2,3,4,5,9,10), main work areas with restricted housing facilities
CHANDIGARH CITY
Growth in Density
1981-91
(Data by Sectors)

Persons/Km²

City average: 845 persons/Km²

City average: 845 persons/Km²

Boundaries:

Town

Sector number

Census town

Out growth

EWS, labour and milkmen colonies

Fig. 31
(numbers 1, 6, 17) and, interestingly, a new Phase II Sector, number 36, a high income low density Sector with predominantly private housing.

**Growth in Density (1981-91)**

Chandigarh city recorded a fairly low growth in population density (845 persons per sq. km.) during 1981-91, as compared to 1868 and 1801 persons per sq. km. during 1961-71 and 1971-81 respectively. This sluggish growth in density was reflected in the decline in population density registered by twenty Phase I Sectors during this decade (Fig. 31). The highest growth in density was recorded in the eight new Phase II Sectors (numbers 39 to 46). Out of these, four were planned as high density areas.

As in the previous decade, the spatial pattern of growth in density greatly corresponded to that of population growth during this decade, validating the observation regarding a trend of higher rates of growth in the new Phase II Sectors and decelerating or even negative growth in the Phase I Sectors. This also suggests a possible dispersal of population facilitated by the push from the overcrowded older Sectors and the pull exerted by developments in housing and new work areas located within the Phase II Sectors as well as on their peripheries.

The spatial pattern of rate of growth in density during this decade reveals two broad areas in the city, an area of decline, comprising most of the Phase I Sectors, and an area of high increase constituted by Phase II Sectors in the south (Fig. 31). Only Sector 25, a Phase I Sector having a number of slums, registered a high rate of increase in density.

On the basis of the decadal pattern of growth in density in the city during 1981-91, the following four types of areas can be identified (Fig. 31):

(i) **Areas of Very High Growth (More than 5660 persons per sq. km.)**

(ii) **Areas of High Growth (from 1405 to 5660 persons per sq. km.)**

(iii) **Areas of Low Growth (From 716 to 1405 persons per sq. km.)**

(iv) **Areas of Very Low Growth (Less than 716 persons per sq. km.)**

i) **Areas of Very High Growth (More than 5660 persons per sq. km.)**

This category comprises Sectors 41, 45, 40, 44, 46, 38 and 47 in order of their rates of growth in density which varied between 19,153 and 5,667 persons per sq. km. in Sectors 41 and 47 respectively. Located along the southern margins of the city, these
Sectors were developed in Phase II of the city’s plan as high density areas (more than 18,532 persons per sq. km.). Among these, Sectors 41, 45, 40, 44 and 46 were enumerated for the first time in 1981. The very high growth in density in these Sectors may be attributed to the presence of Outgrowths (Buterla, Badheri in Sector 41), Census Town (Burail in Sector 45), the development of multistoried HIG, MIG, LIG and EWS housing, institutional housing (defence, PWD, RBI) and proximity to such major work areas as the Industrial Area, Mohali and the Air Force Base. Interestingly, Sector 41 emerged as the only Phase II Sector with a density (19507 persons per sq. km.) in excess of its planned density (17,910 persons per sq.km.) in 1991, the very first decade of its development. The very high growth in density in these Sectors was also accompanied by a high growth in population.

ii) **Areas of High Growth (From 1405 to 5660 persons per sq. km.)**

This category comprises of Sectors 37, 32, 25, 43, 33 and 42 in order of their rates of growth in density which varied between 4287 and 1418 persons per sq. km. in Sectors 37 and 42 respectively. Sectors 37, 32 and 33 developed initially with private housing. Additional provisions of multistoried HIG, LIG and EWS flats and institutions with associated housing (GMC, SOI, RBI, ITBP) added to the intensity of development in these Sectors. However, the rates of growth in density during this decade were lower as compared to the previous decade, conforming to the trend identified earlier. Sectors 43 and 42, enumerated for the first time in 1981, were planned as low density areas and large portions of land within these Sectors were reserved for future use, commercial functions in both Sectors and the ISBT and second city sub-centre in Sector 43. This restricted the extent of area for residential use in these Sectors. The rapid development of housing in these Sectors contributed to a high growth during 1981-91.

Additional housing for the Panjab University employees was planned in Sector 25, a Phase I Sector. However, its peripheral location and proximity to such work areas as the University and the PGI, attracted slums and labour colonies, resulting in an increase in population density, although the rate of growth of its population (3.54 per cent) was the lowest in the city during this decade. Its population density (9172 persons per sq. km.) continued to be in excess of its planned density (8824 persons per sq. km.) in 1991 also, although a large part of this Sector was yet to be developed.
iii) **Areas of Low Growth (From 716 to 1405 persons per sq. km.)**

This category comprises of Sectors 34, 24, 29, 31, 36, the Industrial Area and Sector 35 in order of their growth in density which varied between 1392 and 716 persons per sq. km. in Sectors 34 and 35 respectively. With the exception of Sectors 24 and 29, all the Sectors in this category developed during Phase II and were located in the southern part of the city (Fig.31). The growth in density in these Sectors, except Sector 39, was at lower rate as compared to the previous decade, a trend already identified for many Sectors in the city. Sector 39, inspite of being enumerated for the first time in 1981, registered a low growth in density instead of the usual high growth observed for such Sectors. This may be attributed to its limited development. However, it recorded a very high population growth during 1981-91 due to a small population at the start of the decade.

iv) **Areas of Very Low Growth (Less than 716 persons per sq. km.)**

This category includes Sectors 30, 28, 3, 12, 2 and 5 in order of their rates of growth in density which varied between 544 and 103 persons per sq. km. in Sectors 30 and 5 respectively. Out of these, Sectors 28 and 30 are located on the eastern peripheries and the rest in the north of the city (Fig.31). All these Sectors had developed during Phase I of the city’s development. Among these, Sector 28 had housing for industrial workers, Sectors 30 and 12 developed as institutional Sectors and Sectors 2, 3 and 5 as low density high income group areas. The growth rate in density in Sectors 30, 28 and 12 was lower as compared to the one recorded during the previous decade. However, despite successively declining density values, the density in Sectors 30 and 12 was in excess of their planned targets in 1991. Similarly, the densities of Sectors 3 and 5 exceeded their planned levels in 1991. At the same time, Sector 2, which had registered a decline in its density during the previous decade, recorded an increase in its density.

**Areas of Decline**

Twenty out of the forty-six Sectors in Chandigarh registered a decline in density during this decade (Fig.31). All of these belong to the First Phase, and also recorded a decline in population. Thirteen of these twenty Sectors had exceeded their planned densities during various decades since 1961, four Sectors (numbers 20, 22, 23, 27) continuously since 1971; another four (numbers 7, 9, 11) since 1981. one (Sector 17) in

On the basis of the rates of decline in population density, four types of areas can be identified (Fig. 31):

(i) Areas of Very High Decline (More than 2104 persons per sq. km.)

(ii) Areas of High Decline (From 656 to 2104 persons per sq. km.)

(iii) Areas of Low Decline (From 405 to 656 persons per sq. km.)

(iv) Areas of Very Low Decline (Less than 405 persons per sq. km.)

i) Areas of Very High Decline (More than 2104 persons per sq. km.)

This category comprises of Sectors 26,22,20,27 and 23 in order of their rates of decline which varied between 5532 and 2105 persons per sq. km. in Sectors 26 and 23 respectively. All these five Sectors had exceeded their planned density levels during one decade or another, Sector 26 in 1981 only and Sectors 22,20,27 and 23 continuously since 1971. Sector 26 recorded a substantial decline in its density, from 6481 persons per sq. km. in 1981 to 949 persons per sq. km. in 1991, largely due to the relocation of labour colonies and unauthorized settlements to Sector 26 East and East extension. The other four Sectors in this category developed with small-sized plots. Since the infilling and expansion of housing within these Sectors is possible only up to a certain extent, these Sectors have probably reached a saturation level. Also, being among the first Sectors to be developed, the younger generation probably migrated out in search of employment or after getting employment. There could also be a shifting out of population due to conditions of overcrowding and congestion. These Sectors also comprise areas of population decline. However, inspite of substantial declines in density, these Sectors continue to be among the most crowded in the city.

ii) Areas of High Decline (From 656 to 2104 persons per sq. km.)

This category includes Sectors 21, 7,15,14 and 18 in order of their rates of decline which varied between 1821 and 733 persons per sq. km. in Sectors 21 and 18 respectively. These Sectors have developed as areas of high crowding mainly due to their proximity to major work areas located in Phase I. The densities of Sectors 21 and 15 exceeded their planned level in 1981, and that of Sector 7 since 1981. In fact, the densities of Sectors 21 and 15 declined sufficiently in 1991 to be within their planned...
levels. Sector 14, the university campus, had recorded a low growth in density during the previous decades and a decline during this decade. All the Sectors in this category were proposed as medium density areas.

iii) Areas of Low Decline (From 405 to 656 persons per sq. km.)

This category comprises of Sectors 16, 4, 19, 10 and 8 in order of their rates of decline which varied between 580 and 405 persons per sq. km. in Sectors 16 and 8 respectively. These Sectors had registered a low growth in density during 1971-81, and, in accordance with the trend already observed, registered a decline during the present decade. The density in Sector 16, which had exceeded its planned target in 1981, and Sector 4, which had exceeded its target since 1971, declined sufficiently to be within the proposed levels in 1991.

iv) Areas of Very Low Decline (Less than 405 persons per sq. km.)

This category includes Sectors 6, 11, 17, 1 and 9 in order of their rates of decline which varied between 268 and 29 persons per sq. km. in Sectors 6 and 9 respectively. These five Sectors were planned as low density areas (less than 6177 persons per sq. km.). Sectors 1, 6 and 17 are institutional areas with restricted housing. The fluctuating change in their densities, decline during 1961-71, growth during 1971-81 and decline during 1981-91, may be attributed to certain administrative changes and temporary developments. Inspite of registering a decline, the densities of Sectors 11, 9 and 17 continued to be in excess of their planned densities in 1991 as well.

During this decade, an inverse relationship between the density values at the beginning of the decade and the growth in density during the decade was observed in twenty-eight of the total forty-six Sectors in the city. Nineteen Sectors had a high population density in 1981, but recorded a low or even negative growth during 1981-91. Seventeen of these nineteen Sectors had developed during Phase I. Further, thirteen of these nineteen Sectors recorded negative growth during the decade. All these nineteen Sectors were predominantly residential Sectors, proposed as high or medium density areas. In addition, nine Sectors had a low density in 1981, but recorded high growth in density during 1981-91. All these nine Sectors developed during Phase II.

In comparison, only four Sectors in the city had a high population density in 1981 and also registered a high growth in density during 1981-91. Among these four,
CHANDIGARH CITY
Density Patterns
1991
(Data by Sectors)

Persons/Km²:
12464
8284
2978

City average: 7333 persons/Km²

Boundaries
Town
Sector
Sector number
Census town
Out growth

Fig. 32
three Sectors (numbers 37,38,47) belong to Phase II and were planned as high density areas. The fourth, Sector 25, was planned as a medium density area. However, the presence of slums and squatter settlements resulted in its emerging as a high density area, with a density in excess of its planned target. An additional fourteen Sectors had low density values in 1981, and also registered low or even negative growth in density during 1981-91. These included eight Phase I Sectors planned as low density areas or main work areas with restricted housing facilities, and three Phase II Sectors. Twelve of these fourteen Sectors were proposed as low density areas.

Density Patterns (1991)

In 1991, Chandigarh city recorded a density of 7333 persons per sq. km., one of the highest densities for urban areas in the country. Fifteen of the forty-six Sectors in the city exceeded their proposed density levels in 1991. Interestingly, fourteen of these fifteen Sectors came up during the First Phase of the city’s development and many of these had registered a decline in their density values during 1981-91. On the basis of the density levels in various Sectors of the city in 1991, four types of areas can be identified (Fig.32):

(i) Areas of Very High Density (More than 12,464 persons per sq. km.)
(ii) Areas of High Density (From 8284 to 12,464 persons per sq. km.)
(iii) Areas of Low Density (From 2,978 to 8,284 persons per sq. km.)
(iv) Areas of Very Low Density (Less than 2978 persons per sq. km.)

i) Areas of Very High Density (More than 12,464 persons per sq. km.)

This category comprises of Sectors 20,41,22,40,37,15,45,23,47,27,21 and 35 in order of their densities in 1991 which varied between 23,926 and 12465 persons per sq. km. in Sectors 20 and 35 respectively.

Among these twelve Sectors, six, 20,22,15,23,27 and 21, belong to Phase I of the city’s development. All of these exceeded their proposed density levels in one decade or another, Sectors 20,22,23 and 27 since 1971 and Sectors 15 and 21 in 1981 only. These Sectors have registered high densities since 1961, and at present form one of the most crowded areas of the city, characterized mainly by small sized private and public housing. These occur as a crescent extending from east to west along the southern limits of Phase I of Chandigarh’s development (Fig.32).
An equal number of Phase II Sectors, 41, 40, 37, 45, 47 and 35, also recorded very high population densities in 1991. Most of these were planned as high density areas. Among these, Sector 41 exceeded its planned density level in 1991. The other Sectors are expected to register higher densities in the coming decade as a result of further developments in housing and infrastructure.

ii) Areas of High Density (From 8284 to 12464 persons per sq.km.)

This category comprises of Sectors 38, 7, 29, 19, 24, 44, 30, 28, 32, 25 and 31 in order of their population densities in 1991, which varied between 12,067 and 8,780 persons per sq. km. in Sectors 38 and 31 respectively. The Sectors in this category form two main areas of high density, one on the eastern margin of the city adjoining the Industrial Area, and the other on the southern part of the western margins (Fig.32). Only Sector 44, located on the southern periphery, occurs as an isolated patch. However, all the Sectors in this category adjoin areas of higher densities, and along with these largely cover the eastern and western limits of the city and the central areas of Chandigarh comprising the southern limits of Phase I (Fig.32).

Among the Phase I Sectors in this category, the densities of Sectors 7, 30 and 25 have exceeded their planned targets since 1981 and Sector 24 in 1991 only. Sector 25 continues to remain partially developed in 1991 also. Sectors 28 and 29, located adjacent to the Industrial Area, had recorded the lowest densities in the city in 1961. By 1991, these Sectors had developed into areas of high density.

The Phase II Sectors in this category, Sectors 38 and 44, proposed as high density areas, and Sectors 32 and 31, as medium density areas, are expected to develop further and record higher densities in the coming decades.

iii) Areas of Low Density (From 2978 to 8284 persons per sq. km.)

This category comprises an eclectic mix of Phase I and II Sectors, numbers 46, 18, 8, 33, 14, 11, 16, 34, 12, 36, 10 and 43. The two are separated by a belt of high density area, with the Phase I Sectors located to its north and the Phase II Sectors to its south (Fig.32). All these Sectors were proposed as medium or low density areas in the city plans.

Prominent in this category are the Phase I Sectors, 10, 11, 12, 14, located in the north-western part and comprising the educational zone. Although, since 1961, the
population densities of these four Sectors have increased considerably, and those of Sectors 11 and 12 have exceeded their proposed levels since 1981, these continue to be areas of low density in the city. The low density among the Phase II Sectors in this category, 46,33,34,36,43, can be broadly attributed to their partial development.

iv) **Areas of Very Low Density (Less than 2978 persons per sq. km.)**

This category includes the Industrial Area, Sectors 9,5,2,3,39,4,42,17,26,6 and 1 in order of their density values in 1991 which varied between 2951 and 13 persons per sq. km. in the Industrial Area and Sector 1 respectively. All the Sectors in this category, except Sectors 39 and 42, came up during Phase I and are located towards the northern limits of the city, with an extension to the south (Fig.32). All the Sectors in this category, except Sector 39, a medium density Sector, were proposed to be low density areas. The Phase I Sectors in this category registered low densities in 1961 as well. Interestingly, the main work areas of the city, Sectors 1,17,26, and the Industrial Area recorded among the lowest densities in the city in 1991 mainly due to the restricted housing infrastructure in these Sectors.

2. **SEX RATIO**

Sex ratio, generally expressed as the number of females per 1000 males, is an important indicator of the economy and the social needs of a community. In urban areas, it has specific implications for the size of the labour force, the employment pattern and the provision of urban amenities (4). The sex ratio of urban populations is closely related to the functional character of towns. An acknowledged characteristic of the population of administrative headquarters towns is initially lower values of sex ratio associated with male selective in-migration in response to specific employment opportunities (5). However, the sex ratio improves as the urban environment becomes more conducive to family-type living.

The above observation holds true for Chandigarh city also. From only 625 females per 1000 males in 1961, the sex ratio of the city improved to 817 females per 1000 males in 1991. In comparison, the sex ratio of the population residing in the U.T., which includes the city, was 790 females per 1000 males, the lowest in the country in 1991. This indicates the dominantly male character of population in the immediate
CHANDIGARH CITY
Sex Ratio
1961
(Data by Sectors)

Females/1000 males
634.5
532.0
402.0
City average: 625 females per 1000 males

Boundaries:
Fig. 33
vicinity of the city. The growth in sex ratio in Chandigarh city since its inception has been modest, 127, 28 and 37 females per 1000 males during 1961-71, 1971-81 and 1981-91 respectively. These figures also indicate the trend of an initial spurt, followed by sluggish growth and finally, a marginal improvement. In absolute terms, the sex ratio of Chandigarh has improved consistently since 1961. It was 625, 752, 780 and 817 females per 1000 males in 1961, 1971, 1981 and 1991 respectively.

**Distribution of Sex Ratio (1961)**

In 1961, the city had a low sex ratio of 625 females per 1000 males. This may be attributed to the early stage in the development of the city, which attracted more males in response to specific employment avenues present in a new city. Housing had not yet been fully developed and construction was being carried out on a large scale.

On the basis of the sex ratio values in various Sectors of the city in 1961, four types of areas can be identified (Fig.33):

(i) Areas of Very High Sex Ratio (More than 634.5 females per 1000 males)

(ii) Areas of High Sex Ratio (From 532 to 634.5 females per 1000 males)

(iii) Areas of Low Sex Ratio (From 402 to 532 females per 1000 males)

(iv) Areas of Very Low Sex Ratio (Less than 402 females per 1000 males)

i) **Areas of Very High Sex Ratio (More than 634.5 females per 1000 males)**

This category comprises of Sectors 23, 22, 7, 19, 27, 16 and 20 in order of their sex ratio values which varied between 772 and 641 females per 1000 males in Sectors 23 and 20 respectively. All these Sectors were among the earliest to be developed in Chandigarh, mainly with government housing. The very high sex ratio in these may be attributed to the existence of family-type housing and infrastructural facilities. These Sectors formed two compact blocks, one in the east and the other in the west (Fig.33).

ii) **Areas of High Sex Ratio (From 532 to 634.5 females per 1000 males)**

This category includes Sectors 21, 24, 25, 18, 8, 30, 14 and 11 in order of their sex ratio values, which varied between 628 and 532 females per 1000 males in Sectors 21 and 11 respectively. Among these, Sectors 21, 18 and 8 developed with private housing only, Sectors 24, 30 and 11 with private and institutional housing and Sector 14, the University Campus, with only institutional housing. In 1961, Sector 25 was yet to develop to provide additional housing for the University employees. Its undeveloped nature and
peripheral location resulted in its being occupied by slums and squatter settlements. It recorded a sex ratio of 575 females per 1000 males. Along with Sectors 24, 14 and 11, it formed an area of high sex ratio in the west of the city (Fig.33). The other Sectors in this category were located adjacent to or between areas of higher sex ratio.

iii) Areas of Low Sex Ratio (From 402 to 532 females per 1000 males)

This category comprises of Sectors 15, 6, 5, 2, 9, 26 and 4 in order of their sex ratio values which varied between 515 and 407 females per 1000 females in Sectors 15 and 4 respectively. All the Sectors in this category, except Sector 15, were located on the northern margins of the city (Fig.33). The low sex ratio values in these Sectors may be attributed both to their undeveloped state and residential and functional character. For example, the goods transport area and wholesale market located in Sector 26 could hardly be considered conducive for family-type living or providing employment opportunities to female workers. In comparison, Sector 15, a residential Sector in proximity to educational institutions located in adjoining Sectors, had only limited housing and other facilities resulting in a low sex ratio (515 females per 1000 males) in 1961.

iv) Areas of Very Low Sex Ratio (Less than 402 females per 1000 males)

This category comprises of Sectors 10, 17, 29, 3, 1, the Industrial Area, Sectors 12 and 28. The sex ratio values in these varied between 397 and 222 females per 1000 males. The low sex ratio values in these may be associated with the early stage of development of housing in Sectors 10, 3 and 12 and restricted housing in Sectors 1 and 17, housing the Capitol Complex and City Centre respectively. In Sectors 28 and 29, reserved for industrial housing, the low sex ratio values and density levels attest to their undeveloped nature. The Sectors in this category were located mainly in the north of the city forming institutional or high income group areas, and on the eastern periphery, adjacent to the Industrial Area and housing the industrial workers (Fig.33).

Thus, the sex ratio values confirmed broadly to the extent of development of housing and other infrastructural facilities in the city in 1961.

Growth in Sex Ratio (1961-71)

In 1961, Chandigarh recorded a sex ratio of 625 females per 1000 males. A large male-dominant labour force engaged mainly in construction and development activities in the city contributed to the depressed sex ratio values. By 1971, the sex ratio
CHANDIGARH CITY
Growth in Sex Ratio
1961-71
(Data by Sectors)

Females/1000 males

- 248
- 166
- 110

Enumerated for the first time in 1971

City average: 127 females per 1000 males

Fig. 34
in the city had improved to 752 females per 1000 males, yielding a growth of 127 females per 1000 males during 1961-71. The improvement in sex ratio followed developments in housing and the availability and provision of associated amenities and services. The highest change in sex ratio, 579 females per 1000 males, was registered in Sector 28, and the lowest, 27 females per 1000 males in Sector 2. Interestingly, while most of the Sectors that registered a high growth in their population during this decade were located in the southern parts of the city, the Sectors registering a high growth in their sex ratios were mainly in the northern parts of the city (Figs.25 and 34). The former mainly had government and private housing for middle and low income groups, the latter formed high income low density and institutional Sectors.

On the basis of the spatial variations in the growth of sex ratio during 1961-71, four types of areas can be identified in the city (Fig.34):

(i) Areas of Very High Growth (More than 248 females per 1000 males)
(ii) Areas of High Growth (From 166 to 248 females per 1000 males)
(iii) Areas of Low Growth (From 110 to 166 females per 1000 males)
(iv) Areas of Very Low Growth (Less than 110 females per 1000 males)

i) Areas of Very High Growth (More than 248 females per 1000 males)

This category comprises of Sectors 28,29,5,11,17,18 and 8 in order of their growth in sex ratio which varied between 579 and 249 females per 1000 males in Sectors 28 and 8 respectively. The very high growth in sex ratio in Sectors 28 and 29 (579 and 390 females per 1000 males respectively) can be attributed to an extremely small female population in these Sectors in 1961, 36 and 4 females respectively. The development of industrial and institutional housing in these Sectors seems to have contributed to the high increase in sex ratio. Both these Sectors also registered a very high growth in all other attributes, namely, population growth, density, workforce, literacy and Scheduled Castes population, during this decade. In comparison, although Sector 5 recorded a very low population growth during 1961-71, the very high change in sex ratio was due to a larger absolute increase in the number of females than males in 1971 – the additional 107 persons in 1971 included 100 females but only 7 males. This seems to be related to some specific event, since this Sector was to follow an inconsistent trend in its change in sex ratio during the following decades.
Sector 11 recorded the highest sex ratio in the city in 1971, 888 females per 1000 males. The very high growth in sex ratio during 1961-71, 356 females per 1000 males, was associated with the development of housing (both public and private) and the presence of educational institutions with women's hostels in this Sector. Similarly, the very high growth in sex ratio in Sectors 18 and 8 could be attributed to the development of housing. These three Sectors, 11, 18 and 8, also recorded a high population growth during this decade.

An aberration in this category was Sector 17, housing the City Centre. It registered a decline in its population. However the growth of 284 females per 1000 males, from 333 to 617 females per 1000 males was due to a greater decline in the number of males (489 males) as compared to females (71 females) during 1961-71. Like Sector 5, this was also probably related to some specific event.

ii) *Areas of High Growth (From 166 to 248 females per 1000 males)*

This category comprises of Sectors located adjacent to those experiencing higher growth, and includes Sectors 12, 15, 9, 3, 21, 20 and 10 in order of their rates of growth in sex ratio (Fig.34). This varied between 241 females per 1000 males in Sector 12 and 166 females per 1000 males in Sector 10. All the Sectors in this category, excluding Sectors 9 and 3, also recorded high or very high population growth during this decade. Sectors 9 and 3 registered low and very low growth in population respectively.

Sector 12, which registered the highest increase in this category, developed as an institutional Sector, housing the PGI and the Engineering and Architecture Colleges, with hostel accommodation for women and campus housing for employees. The increase in the female population was probably related to the availability of institutional housing and avenues for female employment in the PGI. The high growth in sex ratio in the adjoining Sector 15 was related to the development of private and public housing, and to its proximity to educational institutions located in Sectors 10, 11, 12 and 14. Sectors 9 and 3 were proposed as low density high income Sectors. The fairly high increase in sex ratio (198 and 192 females per 1000 males respectively) was probably due to the small base of female population in these Sectors in 1961, which increased by 173 and 111 per cent respectively in 1971. The housing in Sectors 21 and 20 was intended for the lower ranked employees and income groups. Due to a high rate of increase in their sex ratio
from 628 and 641 females per 1000 males respectively in 1961 to 801 and 808 females per 1000 males respectively in 1971, these Sectors continued to be areas of high sex ratio. Sector 10, which recorded the lowest increase in sex ratio in this category, developed with public and private housing and also housed educational institutions with hostel facilities for women.

In all these Sectors, development in housing attracting family-type migration was the main contributing factor to the high increase in the number of females as compared to males during this decade.

iii) **Areas of Low Growth (From 110 to 166 females per 1000 males)**

This category comprises of Sector 4, the Industrial Area, Sectors 25, 26, 30, 14 and 19 in order of their rates of growth in sex ratio, which varied between 143 females per 1000 males in Sector 4 and 110 females per 1000 males in Sector 19. In Sector 4, planned as a low density high income group area, the small increase in sex ratio was associated with a very low population growth during this decade. The low growth in sex ratio (134 females per 1000 males) in the Industrial Area is reflective of its functional nature. Its sex ratio in 1961 and 1971 (310 and 444 females per 1000 males respectively) was among the lowest in the city.

Although Sector 25 recorded a very high population growth during this decade, the growth in its sex ratio was low (133 females per 1000 males). This was associated with the preponderance of male temporary labourers living in slums and labour colonies located in this Sector, a familiar situation in similar areas in other cities also. Similarly, the wholesale market and goods transport area located in Sector 26, promoted the growth of a male dominant population. In 1971, this Sector had one of the lowest sex ratios in the city (540 females per 1000 males). The low growth in sex ratio in Sectors 14 and 30 could be associated with their status as institutional areas with limited employment and residential facilities. Their sex ratios in both 1961 and 1971 were consistently below the city average of 625 and 752 females per 1000 males respectively. Incidentally, Sector 14 also registered the lowest rate of population growth in the city during 1961-71. In Sector 19, one of the earliest Sectors to be developed and which had recorded sex ratios above the city average in 1961 as well as 1971, the low rate of increase in sex ratio was again due to the limited extent of development of housing.
iv) **Areas of Very Low Growth (Less than 110 females per 1000 males)**

This category comprises of Sectors 16, 27, 22, 24, 23 and 2 in order of their rates of growth in sex ratio, which varied between 87 females per 1000 males in Sector 16 and 27 females per 1000 males in Sector 2. Both these Sectors were proposed as low density areas. However, Sector 16 had a fairly high sex ratio (651 females per 1000 males) in 1961, and the very low growth in its sex ratio conforms to the trend of an inverse relationship between the values at the start of the decade and the rate of increase during the decade. This Sector also registered a low rate of growth in its population. In comparison, Sector 2 already had a low sex ratio in 1961. The low rate of growth in its sex ratio is associated with the limited potential for further increase in this low density high income group Sector.

Sectors 27, 22 and 23 were among the earliest Sectors to be developed in the city, and by 1971, their population had exceeded their planned targets. Due to an intensive development at an early stage, their sex ratios were already among the highest in the city in 1961 itself. The very low rate of change in sex ratio in these during 1961-71 conforms to the trend of an inverse relationship between the level of sex ratio at the start of the decade and the rate of increase during the decade. The low rate of increase in sex ratio in Sector 24 also conforms to this trend. Its low rate of growth was also associated with its status as a Sector with institutional and public housing, which by its very nature is limited in extent.

Three Sectors (numbers 6, 7 and 1) registered a decline in their sex ratios (by 128, 15 and 12 females per 1000 males respectively) during this decade. Sectors 1 and 6 were developed with institutional housing. Both these Sectors had fairly low sex ratios in 1961 also. In comparison, Sector 7 had registered the third highest sex ratio in the city (728 females per 1000 males) in 1961. It declined to 713 females per 1000 males in 1971. However, the decline in sex ratio in Sector 7, as well as in other Sectors seems incidental, since these three Sectors improved their sex ratio in the succeeding decade. The population enumerated as living in temporary hutments in Sectors 14, 26, 30 and near the Railway Station registered a marginal decline in its sex ratio (by 2 females per 1000 males) during 1961-71. Interestingly, the sex ratio of these areas in 1961 (661 females...
CHANDIGARH CITY
Growth in Sex Ratio
1971-81
(Data by Sectors)

- Females/1000 males
  - 143
  - 81.5
  - 43

Enumerated for the first time in 1981

Figures outside the circle indicate females per 1000 males

City average: 28 females per 1000 males

Boundaries:
- Town
- Sector
- Census town
- Out growth
- Peripheral areas

Fig. 35
per 1000 males) was higher than the city average (625 females per 1000 males). However, in 1971, although the sex ratio in these remained almost unchanged (659 females per 1000 males), it was much lower than the city average (752 females per 1000 males).

During 1961-71, the growth in sex ratio in nineteen out of the twenty-nine Sectors in the city was inversely related to the sex ratios at the start of the decade in 1961. Only five Sectors, which had a high sex ratio in 1961, also experienced a high growth in it. Of these, three (Sectors 8, 18, 21) developed with private housing, one, (Sector 20), with public and private housing for lower income groups, and one, (Sector 11), with private housing and educational institutions with hostel facilities for women. Another five Sectors had a low sex ratio in 1961 and recorded a low or even negative growth in their sex ratios during 1961-71. Among these, Sector 1 housed the Capitol Complex, Sector 4, Legislators Hostels and high income private housing, Sector 6, the Governor’s Residence and staff housing, Sector 2, high income private housing and Sector 26, the wholesale trade and goods transport area.

**Growth in Sex Ratio (1971-81)**

During this decade, nine additional Sectors (31 to 38 and 47) were developed in the Second Phase of the city’s development. The Second Phase of Industrial Area also came up during this decade. The sex ratio for the city continued to be low, 780 females per 1000 males in 1981, although there was an increase of 28 females per 1000 males. Ten out of a total of thirty-eight Sectors, which included three Sectors developed in Phase Two, registered a decline in sex ratio. During this decade, the highest growth (364 females per 1000 males) was recorded in Sector 36, and the lowest (28 females per 1000 males) in Sector 16. Both those Sectors were planned as low density areas. While Sector 36 started developing in Phase II, Sector 16 had developed during Phase I.

On the basis of the spatial variations in the rate of growth in sex ratio in different Sectors in Chandigarh, four types of areas can be identified (Fig.35):

(i) Areas of Very High Growth (more than 143 females per 100 males)
(ii) Areas of High Growth (From 81.50 to 143 females per 1000 males)
(iii) Areas of Low Growth (From 43 to 81.50 females per 1000 males)
(iv) Areas of Very Low Growth (Less 43 females per 1000 males)
i) **Areas of Very High Growth (More than 143 females per 1000 males)**

Sectors 36,2,34,31,32,4 and 3 registered a very high rate of change in sex ratio, which varied between 364 and 144 females per 1000 males in Sectors 36 and 3 respectively. Locationally, these Sectors form two distinct areas, Sectors 36, 34, 31 and 32 on the southern periphery of the city, and Sectors 2, 4 and 3 on the northern edge of the city (Fig.35). The former group of Sectors, developed during Phase II, were enumerated for the first time in 1971. The very high growth in sex ratio in these can be associated with a small base of female population in 1971 and the low level of infrastructure and housing in these Sectors. By 1981, these had developed sufficiently to prompt a very high growth in sex ratio. This was also commensurate with the general trend of high rates of growth of population in newly developed Sectors. Although Sector 36 was planned as a low density area, the coming up of a women’s undergraduate college with hostel facilities contributed to a higher rate of growth in sex ratio. The other new Sectors in this category were planned as medium density areas. In comparison, the older Sectors, 2,3 and 4, developed as low density high income group areas. During this decade, these Sectors conformed to the trend of an inverse relationship between the level of sex ratio at the start of the decade, and the rate of growth during the decade. These Sectors had fairly low sex ratios in 1971 (less than 612 females per 1000 males). Interestingly, while the population in Sector 2 registered a decline during this decade, its sex ratio improved from 439 to 731 females per 1000 males, due to a decline in the number of males but an increase in the number of females.

ii) **Areas of High Growth (From 81.5 to 143 females per 1000 males)**

This category comprises of Sector 35, the Industrial Area, Sectors 9,1,12,10,26 and 30 in order of their rates of growth in sex ratio, which varied between 128 and 82 females per 1000 males in Sectors 35 and 30 respectively. Among these, Sectors 26, 30 and 35 occur as isolated patches. The others form a cluster in the north-west of the city(Fig.35).

Sector 35, the only Phase II Sector in this category, was enumerated for the first time in 1971. The high growth in sex ratio, associated with its recent development, conforms to the general trend of high growth in the early years of a Sector’s development. All the other Sectors in this category, excluding Sector 9, developed either
partly or wholly as institutional areas, the Industrial Area, the Capitol Complex in Sector 1, the PGI, the Engineering and the Architecture Colleges in Sector 12, the Art and Home Science Colleges in Sector 10, the wholesale market and goods transport area in Sector 26, the CSIO and ISTC in Sector 30, and had low sex ratios at the start of the decade. The high rate of growth in sex ratio in these Sectors during this decade, therefore, conforms to the trend of an inverse relationship between the level of sex ratio at the start of the decade, and the level of its growth during the decade. Sector 9, which developed only with private housing as a high income group Sector, also had a low sex ratio in 1971. Further, in all these Sectors, excluding Sector 1, the rate of growth in sex ratio during 1971-81 was lower as compared to the previous decade. This trend conforms to the general pattern of sluggish growth after an initial rapid increase.

iii) Areas of Low Growth (From 43 to 81.5 females per 1000 males)

This category comprises of Sectors 24,07,11,29,15,21,14 and 28 in order of their rates of growth in sex ratio which varied between 81 females per 1000 males in Sector 24 and 43 females per 1000 males in Sector 28. Among the Sectors in this category, Sectors 11,14,15 and 24 form a contiguous area in the west of the city, and Sectors 28 and 29 in the east (Fig.35).

All the Sectors in this category, except Sectors 24 and 7, recorded a lower level of change in sex ratio during this decade as compared to the previous decade. The growth in sex ratio in Sector 24, during this decade was higher as compared to the previous decade, and was associated with the expansion in housing. Sector 7 had recorded a marginal decline of 14 females per 1000 males during the previous decade. The increase of 80 females per 1000 males during this decade, though of a low level, resulted in a high value of sex ratio (793 females per 1000 males) in this Sector. The low growth in sex ratio in Sectors 28 and 29 was associated mainly with industrial housing located in these Sectors.

iv) Areas of Very Low Growth (Less than 43 females per 1000 males)

This category comprises of Sectors 20,23,33,27,19 and 16 in order of their rate of growth in sex ratio, which varied between 39 and 28 females per 1000 males in Sectors 20 and 16 respectively. Sector 33, the only Phase II Sector in this category, recorded a very low growth of 31 females per 1000 males, although its population
increased at a very high rate (243.52 per cent) during this decade. It had a high sex ratio in 1971 (789 females per 1000 males), and conforming to the trend of inverse rates of growth during the decade, registered a low rate of growth. Inspite of this low growth, this Sector had a high sex ratio (820 females per 1000 males) in 1981. The other Sectors in this category, 20, 23, 27, 19 and 16, had high ratios in 1971, and follow the trend of an inverse relationship between absolute values of sex ratio at the beginning of the decade and its growth during the decade. Also, the rates of growth in sex ratio in these Sectors during 1971-81 were lower as compared to the previous decade. The low growth in sex ratio was also accompanied by a low growth in population.

In 1971, the Peripheral Areas of Chandigarh comprised temporary hutments in Sector 14, 26 and 30 and near the Railway Station. In 1981, the Peripheral Areas of the city also included Ram Darbar, Korsan and Dadu Majra colonies, which were developed around former village settlements of the same name as resettlement and rehabilitation areas. The increase in sex ratio of the Peripheral Areas, from 659 females per 1000 males in 1971 to 778 females per 1000 males in 1981, was associated mainly with an improvement in living and housing facilities as part of the resettlement projects.

During 1971-81, ten Sectors, 17, 5, 37, 47, 18, 22, 38, 8, 25 and 6, recorded a decline in sex ratio. Out of these ten Sectors, six, (Sectors 17, 25, 6, 37, 47 and 38) recorded a high growth of population during this decade. These included three Phase II Sectors (numbers 37, 38, 47), which were enumerated for the first time in 1971 and had high sex ratios in 1971. The decline in sex ratio in these three Sectors during 1971-81 was probably associated with an increase in construction activities, in which a higher proportion of males were employed. These Sectors had been planned as high density Sectors with mainly private housing. In comparison, the other three Sectors (numbers 17, 25, 6) developed as institutional Sectors in Phase I. While the decline in sex ratio in Sectors 25 and 6 was marginal (eight and one female per 1000 males respectively), in Sector 17, it was substantial (414 females per 1000 males). It was probably associated with increased construction activity and proliferation of other male-dominated activities. The other four Sectors (numbers 5, 18, 22 and 8) which recorded a decline in sex ratio, also registered a low rate of population growth during 1971-81. This decline seems to
have been incidental, since during the following decade, their sex ratios improved and recorded a positive growth.

During 1971-81, the trend of an increase in sex ratio in an inverse relation to the level of the ratio at the beginning of the decade was observed in thirty-one of the thirty-eight Sectors in this city. Out of the thirty-one Sectors, eighteen had a high sex ratio in 1971, but registered a low growth or even decline during 1971-81. These eighteen Sectors included four new Phase II Sectors. Similarly, thirteen Sectors recorded a low sex ratio in 1971, but a high growth in sex ratio during the next decade. These thirteen included nine Sectors developed during Phase I and located on the northern margins of the city, and four developed during Phase II and located on the southern margins of the city.

On the other hand, six Sectors, numbers 6, 7, 14, 17, 24, and 25, recorded a low sex ratio in 1971 and a low or even negative growth during 1971-81. These were either institutional areas or Sectors developed with institutional housing. Only Sector 25 had a concentration of slum population in addition to Panjab University housing. In comparison, only one Sector, number 31, recorded a high sex ratio in 1971 and a high growth in sex ratio during 1971-81. This Sector developed with institutional housing for defence personnel.

**Growth in Sex Ratio (1981-91)**

During this decade, Chandigarh recorded a growth of 37 females per 1000 males and the sex ratio improved from 780 females in 1981 to 817 females per 1000 males in 1991. Despite this improvement, the sex ratio of the city was among the lowest urban sex ratios in India and was much lower than the national urban sex ratio of 894 females per 1000 males.

Eight new Sectors (numbers 39 to 46) were developed during this decade, and as with other attributes, the highest growth in the sex ratio was recorded in these Sectors. Seven Sectors recorded a decline in sex ratio, including three Phase II Sectors. The Phase I Sectors presented an interesting picture with regard to the correspondence between growth of population and sex ratio. Of the twenty Sectors which recorded negative growth in population, only two recorded a corresponding decline in sex ratio. This suggests that in eighteen of these twenty Sectors, the decline in population was more of
CHANDIGARH CITY
Growth in Sex Ratio
1981-91
(Data by Sectors)

Females/1000 males

- 139
- 70
- 43

Figures outside the circle indicate females per 1000 males
City average: 37 females per 1000 males

Fig. 36
the male population than the female population. In fact, most of the Phase I Sectors experienced a marginal improvement in their sex ratio.

On the basis of the decadal growth in sex ratio during 1981-91, four types of areas can be identified (Fig.36):

(i) Areas of Very High Growth (More than 139 females per 1000 males)
(ii) Areas of High Growth (From 70 to 139 females per 1000 males)
(iii) Areas of Low Growth (From 43 to 70 females per 1000 males)
(iv) Areas of Very Low Growth (Less than 43 females per 1000 males)

i) Areas of Very High Growth (More than 139 females per 1000 males)

This category comprises of Sectors 42, 45, 44, 43, 39, 46, 38, 5, 36 and 17 in order of their rates of growth in sex ratio which varied between 586 and 140 females per 1000 males in Sectors 42 and 17 respectively. All the Sectors in this category, except Sectors 5 and 17, form an almost contiguous area on the southern margins of the city (Fig.36).

Sectors 42, 45, 44, 43, 39 and 46, developed in the Second Phase, were enumerated for the first time in 1981. In conformity with the trend of high increase in the initial decade, these Sectors recorded a very high growth in sex ratio. The very high rate of increase in these was also in conformity with the trend of an inverse relationship between the level of sex ratio at the beginning of the decade and the rate of growth during the decade, since these six Sectors recorded low sex ratios in 1981. The main association of high growth in sex ratio as well as total population was with the expansion in housing, private, public and those developed by the Chandigarh Housing Board.

Three Sectors in this category, numbers 38, 5, and 17 had registered a decline in sex ratio during the previous decade. In Sector 38, the addition of EWS and HIG housing prompted a high growth in population (109.68 per cent) as well as sex ratio (171 females per 1000 males). In comparison, Sector 5, registered a marginal increase in population (5.25 per cent), while the population of Sector 17 declined during this decade. In both these Sectors there was a marked decline in the male population, probably associated with the withdrawal of security personnel. In comparison, Sector 36 recorded a high rate of population growth (50.67 per cent) during this decade. It also had a high sex ratio (898 females per 1000 males) in 1981. The main contributing factor to the very high
increase in sex ratio of its population was the expansion in housing and the location of women's colleges with hostel facilities. The latter also probably contributed heavily to this Sector recording the second highest sex ratio (1051 females per 1000 males) in the city in 1991.

ii) Areas of High Growth (From 70 to 139 females per 1000 males)

This category comprises of Sectors 25, 4, 11, 41, 40, 32, 12, 24, 2, the Industrial Area and Sector 26 in order of the rates of growth in sex ratio. All these Sectors have a peripheral location in the city (Fig.36). The growth in sex ratio in these varied between 120 and 70 females per 1000 males in Sectors 25 and 26 respectively.

Among the Sectors in this category, Sectors 41 and 40 were enumerated for the first time in 1981. The high growth in sex ratio in these corresponded with a high growth in population as well. However, in Sector 32, the growth in sex ratio was lower than that recorded during the previous decade. The growth in sex ratio in Sectors 25, 11 and 24 was higher during this decade as compared to the previous decade. In comparison, the growth of population in these Sectors during this decade was either very low (Sectors 25, 26) or even registered a decline (Sector 11). Among these, Sector 25 has housing for the Panjab University employees as well as slums and squatter settlements, Sector 24 has institutional and public housing, and Sector 11 has private and public housing as well as women's hostels for the Government College and College of Architecture and the YWCA hostel and a Working Women's hostel. Thus, the location of hostel facilities for women in Sector 11 has been a major factor for the high sex ratio since 1961. In 1991, inspite of a decline in total population during this decade, this Sector had the highest sex ratio in the city (1081 females per 1000 males).

The other Sectors in this category, numbers 4, 12, 2, 26 and the Industrial Area, recorded a sluggish growth in sex ratio during this decade as compared to that recorded during the previous decade, a common trend in the growth of various Sectors in the city. Nevertheless, the high change in sex ratio specifically in Sector 26 may be associated with the location of hostel facilities for women, namely in Sri Guru Gobind Singh College for Women, the Central Polytechnic and the Technical Teachers Training Institute.
iii) **Areas of Low Growth (From 43 to 70 females per 1000 males)**

This category comprises of Sectors 30, 6, 29, 22, 16, 1, 35, 33, 14 and 23 in order of their rates of growth in sex ratio which varied between 69 and 43 females per 1000 males in Sectors 30 and 23 respectively. Within this category, six Sectors, numbers 6, 22, 16, 33, 14 and 23, recorded a higher growth in their sex ratio during this decade as compared to the previous decade. All these, except Sector 33, are Phase I Sectors which registered a decline in their population during this decade. Thus, the growth in sex ratio in these Sectors, despite an overall population decline, may be associated with a greater outward movement of male population from them. In comparison, Sector 33 registered a low growth in its population.

Four Sectors in this category, numbers 30, 29, 1 and 35, registered a relatively sluggish increase in sex ratio during this decade as compared to the previous decade. All these Sectors, except Sector 1, recorded a low growth in population as well during this decade. On the other hand, Sector 1 recorded a decline in its population.

iv) **Areas of Very Low Growth (Less than 43 females per 1000 males)**

This category comprises of Sectors 7, 37, 27, 15, 18, 21, 20, 9 and 19 in order of their rates of growth in sex ratio, which varied between 39 and 8 females per 1000 males in Sectors 7 and 19 respectively. Locationally, the Sectors in this category, except Sector 9, 15 and 37, form a major area of low growth in sex ratio in the city (Fig.36).

Excluding Sector 37, all the Sectors in this category are Phase I Sectors. These also registered a decline in their population during this decade. The growth in sex ratio, despite a population decline, could be attributed to the possible moving out of the male population from these Sectors. In comparison, Sector 37 registered a low population growth during 1981-91. It already had a high sex ratio (823 females per 1000 males) in 1981, which further improved to 860 females per 1000 males in 1991.

During this decade, seven Sectors, numbers 3, 47, 31, 10, 34, 28 and 8, recorded a decline in sex ratio. The decline in these varied between 359 and 6 females per 1000 males in Sectors 3 and 8 respectively. Interestingly, while there was a substantial decline in sex ratio in Sector 3, its population increased sufficiently to cross its proposed target. This was probably related to an increased occupancy in the Legislators’ Flats and MLA Hostels located in this Sector, and an increase in the number of security personnel
deployed in this Sector. Sectors 47, 31, 34 and 28 had high sex ratios at the start of the decade. The decline in sex ratios in these conforms to the trend of an inverse relationship between the level of sex ratio at the start of the decade and its growth during the decade. Like Sector 3, these Sectors also registered an increase in their populations. In comparison, Sectors 10 and 8 registered a decline in population as well as sex ratio.

The Peripheral Areas of Chandigarh, comprising EWS, Labour and Milkmen Colonies, recorded a decline of 39 females per 1000 males. As in other areas of this nature, this was associated with a male dominant in-migration to these areas.

During this decade, an inverse relationship between the sex ratio in 1981 and its growth during 1981-91 was identified in thirty-five of the forty-six Sectors in Chandigarh. Of these thirty-five, as many as twenty-one Sectors had started developing during Phase I. Out of these twenty-one Phase I Sectors, thirteen had a high sex ratio in 1981, but recorded low or even negative rates of growth in sex ratio during the decade. Another eight Phase I Sectors had low sex ratios in 1981 but registered a high growth during the decade. The former group of thirteen Sectors have a predominance of private housing and were planned as medium density areas. In comparison, the latter group of eight Sectors have mainly institutional housing and were planned as low density areas. Further, fourteen Phase II Sectors also recorded an inverse relationship between the sex ratio in 1981 and its growth during 1981-91.

Only four Sectors had a high sex ratio in 1981 and also registered a high growth in sex ratio during 1981-91. These included Sectors 11 and 36, both high income low density areas with private housing and educational institutions with hostel facilities for women. Among the other two, Sector 40 developed as a high density middle and low income Sector with mixed housing, and Sector 32 as a medium density Sector with private and institutional housing. Seven Sectors had a low sex ratio in 1981, and also recorded a low rate of increase or even decline during 1981-91. These Sectors were institutional Sectors, except Sector 9, which developed as a high income low density Sector with private housing.

**Distribution of Sex Ratio (1991)**

In 1991, the city had a sex ratio of 817 females per 1000 males. This was definitely an improvement over its 1961 sex ratio (625 females per 1000 males), although
CHANDIGARH CITY

Sex Ratio: 1991
(Data by Sectors)

Females/1000 males

866
835
793

City average: 817 females per 1000 males

Fig. 37
it continued to be one of the lowest values for urban India. Within Chandigarh, there was a distinct southward shift in the areas of high sex ratio as compared to the pattern identified in 1961. The areas of high sex ratio in 1991 mainly comprised Phase II Sectors, which had also registered higher rates of growth in population.

On the basis of the sex ratio values in 1991, four types of areas can be identified in the city (Fig.37):

(i) Areas of Very High Sex Ratio (more than 866 females per 1000 males)
(ii) Areas of High Sex Ratio (From 835 to 866 females per 1000 males)
(iii) Areas of Low Sex Ratio (From 793 to 835 females per 1000 males)
(iv) Areas of Very Low Sex Ratio (Less than 793 females per 1000 males)

i) Areas of Very High Sex Ratio (More than 866 females per 1000 males)

This category comprises of Sectors 11, 36, 43, 44, 45, 40, 47, 23, 35, 21, 19 and 33 in order of their sex ratio values which varied between 1081 and 867 females per 1000 males in Sectors 11 and 33 respectively. The largest concentration of these Sectors occurs in the south-central part of the city, and if Sectors having high sex ratio are also included, almost the entire southern part of the city comprises an area of high sex ratio (Fig.37). The predominance of new Phase II Sectors in this category may be associated with the development of HIG, MIG, LIG and EWS flats and Defence housing in these Sectors. Within this category, the top ranked Sector (number 11) had always recorded a high sex ratio since 1961. Planned as a low density high income group Sector with private and public housing, it forms part of the educational zone and has a number of women’s hostels. The second highest sex ratio (1051 females per 1000 males) in the city in 1991 was registered in Sector 36, a Phase II Sector, which is structurally and functionally similar to Sector 11. The other Phase I Sectors in this category, numbers 23, 21, and 19, have not only consistently registered high values of sex ratio since 1961, but have also improved upon their sex ratios registered during different decades.

ii) Areas of High Sex Ratio (From 835 to 866 females per 1000 males)

This category comprises of Sectors 20, 27, 38, 37, 46, 32, 31, 41, 39, 24 and 22 in order of their sex ratio values which varied between 865 and 836 females per 1000 males in Sectors 20 and 22 respectively. Almost without exception, the Sectors in this category adjoin areas of very high sex ratio, and as mentioned earlier, along with these,
nearly cover the entire southern half of the city (Fig.37). The areas of high sex ratio are also dominated by Phase II Sectors. This may be associated with the fact that most of these were planned as high density Sectors.

Out of the four Phase I Sectors in this category, three (numbers 20, 22, and 27) were also proposed as high density areas. The fourth (Sector 24) had only public and institutional housing. The sex ratio in all these four Sectors was high in 1961 itself and further improved by 1991.

iii) *Areas of Low Sex Ratio (From 793 to 835 females per 1000 males)*

This category comprises of Sectors 29, 4, 7, 34, 28, 25, 2, 18, 16, 30, 15 and 5 in order of their sex ratio values which varied between 834 and 793 females per 1000 males in Sectors 29 and 5 respectively. Locationally, these Sectors form patches in the north, east and west of the Phase I limits of the city (Fig.37). Only one Phase II Sector (number 34) is included in this category. Along with private housing, this Sector is being developed as a second business and commercial centre in the city. Although the Phase I Sectors in this category recorded higher sex ratio values in 1991 as compared to 1961, these formed areas of low sex ratio in 1991. Among these, the Sectors located in the north are high income low density areas, those located in the east have industrial and institutional housing, and those in the west enjoy proximity to major work areas.

iv) *Areas of Very Low Sex Ratio (Less than 793 females per 1000 males)*

This category includes Sectors 8,9,12,42,14,26, the Industrial Area, Sectors 10,1,6,17 and 3 in order of their sex ratio values in 1991 which varied between 754 and 310 females per 1000 males in Sectors 8 and 3 respectively. Locationally, all these Sectors, except Sector 42, are in Phase I and comprise older Sectors. Sector 42, the only Phase II Sector in this category, has limited planned housing. In addition it has the Census Town of Attawa, developed around a village of the same name, located in it. All the Phase I Sectors in this category, except Sectors 1 and 3, recorded higher sex ratios in 1991 as compared to 1961. However, many of these had low sex ratios in 1961 also. The decline in sex ratio values in 1991 in Sector 1 may be attributed to its restricted housing facilities, and in Sector 3, to the level of occupancy in the flats and hostels for MLAs.
CHANDIGARH CITY
Literacy Patterns
1961
(Data by Sectors)

Per cent
68.85
62.63
42.76
City average: 60.53 per cent

Boundaries:
Town -------
Sector --------
Sector number ©
Kms

Fig. 38
3. LITERACY

The Indian Census defines a literate as a person who is able to read and write a message in any language with understanding (6). In the last census only persons aged seven and above were included in the literacy count. The literacy levels in an area are an important indicator of the process of socio-economic transformation. The nature of Chandigarh’s dominant function, administration, makes literacy a basic educational qualification *de rigueur*. Secondly, Chandigarh has developed into a major national as well as regional educational centre. The development of industries in and around Chandigarh, and the presence of commercial, financial and other quaternary functions and organizations has resulted in highly skilled, trained and competitive professionals residing in the city.

The rate of growth in literacy in Chandigarh, 168, 79 and 39 per cent during 1961-71, 1971-81 and 1981-91 respectively, has expectedly been higher than the rate of growth of population (144.89, 73.56 and 34.47 per cent) during the same periods. The spatial patterns of growth in literacy in different Sectors of the city during different decades bear a striking resemblance to those of population growth.

**Literacy Patterns (1961)**

In the first census of Chandigarh city, 60.53 per cent of its population was enumerated as literate. This fairly high proportion of literates was related to a comparatively small base of population in 1961 and to the city’s main function, administration.

On the basis of the proportion of literates in various Sectors in 1961, four types of areas can be identified (Fig.38):

(i) **Areas of Very High Literacy (More than 68.85 per cent)**
(ii) **Areas of High Literacy (From 62.63 to 68.85 per cent)**
(iii) **Areas of Low Literacy (From 42.76 to 62.63 per cent)**
(iv) **Areas of Very Low Literacy (Less than 42.76 per cent)**

i) **Areas of Very High Literacy (More than 68.85 per cent)**

This category comprises of Sectors 11,16,3,7,2,23 and 8 in order of their proportion of literates, which varied between 79.33 and 69.66 per cent in Sectors 11 and 8 respectively. The extremely high proportion of literates in Sector 11 was related to its
housing two undergraduate colleges with hostel facilities. In addition, this Sector initially developed with mainly private housing as a high income group area. Among the other Sectors in this category, Sectors 16, 23, 2, 3 and 7 developed with both public and private housing. In comparison, Sector 8 had only private housing. Generally, Sectors having a higher proportion of public housing had a higher proportion of literates.

ii) *Areas of High Literacy (From 62.63 to 68.85 per cent)*

This category includes Sectors 22, 18, 20, 19, 27, 4, 14 and 21 in order of their proportion of literates which varied between 68.05 and 62.63 per cent in Sectors 22 and 21 respectively. All the Sectors in this category, excluding Sectors 4 and 14, form a contiguous block in the south-eastern part of the city (Fig.38). These Sectors were also amongst the first to develop in the city. Sector 22 functioned as the main commercial and business area, and along with Sectors 20, 19 and 27 had predominantly public housing for government servants. In comparison, Sectors 18 and 21 developed only with private housing.

Sector 4, located towards the north of the city, developed with large-sized plots as a high income group area. Sector 14, housed the Panjab University and its campus. In 1961, both these Sectors had 64 per cent of their population registered as literate.

iii) *Areas of Low Literacy (From 42.76 to 62.67 per cent)*

This category includes Sectors 9, 15, 5, 10, 12, 26 and 30. The proportion of literates in these varied between 61.62 and 47.7 per cent in Sectors 9 and 30 respectively. The low proportion of literates in these Sectors was mainly due to their early stage of development. For example, even Sector 12, planned to house the PGI, the Engineering and the Architecture Colleges and their campuses, registered 58.31 per cent of its population as literate. Similarly, Sector 30, also planned as an institutional Sector, recorded the lowest proportion of literates (47.70 per cent) in this category.

iv) *Areas of Very Low Literacy (Less than 42.76 per cent)*

This category includes Sectors 17, 6, the Industrial Area, Sectors 1, 24, 28, 29 and 25. All of these had a peripheral location in the city (Fig.38). The proportion of literates among these varied between 37.82 and 5.66 per cent in Sectors 17 and 25 respectively. The very low literacy levels were related to their undeveloped nature (Sectors 24, 25) and to their functional characteristics (Sectors 17, 6, 1, 28, 29). For
CHANDIGARH CITY
Growth in Literacy
1961-71
(Data by Sectors)

Growth in Literacy
1961-71
(Data by Sectors)

468
134
77

Enumerated for the first time in 1971
City average: 68 per cent

Figures outside the circle indicate per cent

Boundaries:
Town
Sector
Sector number

Kms.

Fig. 39
example, Sectors 17, 6 and 1 were planned to function as the City Centre, Governor’s Residence and Capitol Complex with restricted housing respectively, and Sectors 28 and 29 were planned to house industrial workers.

Growth in Literacy (1961-71)

The rate of growth in literacy during 1961-71 was fairly high (168 per cent). The proportion of literates in the city increased from 60.57 per cent in 1961 to 66.30 per cent in 1971. The increase was associated with the initial development of the city and the small base characteristic of such a stage of development. In addition, the Reorganization of Punjab state in 1966 resulted in an increase in the number of government employees stationed at Chandigarh.

The growth in literacy in the city varied between 128,200 and 31 per cent in Sector 29 and 4 respectively. On the basis of the decadal variations in the growth in literacy during 1961-71, four types of areas can be identified (Fig.39):

(i) Areas of Very High Growth (More than 468 per cent)
(ii) Areas of High Growth (From 134 to 468 per cent)
(iii) Areas of Low Growth (From 77 to 134 per cent)
(iv) Areas of Very Low Growth (Less than 77 per cent)

i) Areas of Very High Growth (More than 468 per cent)

This category comprises of Sectors 29, 28, 8, 25, 24, 21 and 15 in order of their rates of growth in literacy which varied between 128200 per cent in Sector 29 and 469 per cent in Sector 15. The phenomenally high rates of growth in Sectors 29 and 28 (128200 and 13461 per cent respectively) were related to the extremely small base of literate persons in 1961 (2 and 38 persons respectively). This increased to 2566 and 5153 literate persons respectively in 1971. However, the proportion of literates in both these Sectors in 1971 was less than the city average of 66.30 per cent. These Sectors have a predominance of housing for industrial workers. The very high growth in literacy in Sectors 8 and 21, both of which developed with private housing, was also related to a small base of literate population in 1961. More than 75 per cent of their population were recorded as literate in 1971.

The peripheral location of Sector 25, and its proximity to areas with employment opportunities, particularly for menial jobs, resulted in the development of
slums and squatter settlements. In 1961, this Sector recorded only 5.66 per cent of its population as literate, and inspite of a 1290 per cent growth in its literate population during 1961-71, the proportion of literates was 18.70 per cent in 1971. The growth in literacy in Sector 24 was related to the expansion of institutional housing in this Sector. Its literacy level of 23.06 per cent in 1961 increased to 55.44 per cent in 1971. The advantage of vicinal location of Sector 15 to such institutional Sectors as 14, 12, 11 and 10 contributed to the very high rate of growth (468.70 per cent) in its literate population during 1961-71. In 1971, the proportion of literates in this Sector was about 78 per cent, much higher than the city average of 66.30 per cent.

ii) Areas of High Growth (From 134 to 468 per cent)

This category comprises of Sectors 18, 10, the Industrial Area, Sectors 11, 30, 12 and 27 in order of their rates of growth. These Sectors are located adjacent to those registering a very high growth in literacy (Fig.39). The growth varied between 282 and 136 per cent in Sectors 18 and 27 respectively. Sectors 10, 11 and 12, located contiguous to each other, are part of the educational zone in the north - western part of the city. The Home Science, Art and undergraduate colleges, with hostel facilities, are located in Sectors 10 and 11. Sector 12 has the PGI, the Engineering and the Architecture colleges and their campuses. Sector 11 recorded the highest proportion of literates in 1961 as well as in 1971 among these Sectors and in the city (79.3 and 80.9 per cent respectively). In Sector 18, located adjacent to the City Centre and developed mainly with private housing, the proportion of literates increased from 67.6 per cent in 1961 to 78.53 per cent in 1971. The location of the Central Scientific Instruments Organization (CSIO) and its campus in Sector 30 contributed to the high growth (165 per cent) in literacy in this Sector. In the Industrial Area, the low base of literate persons in 1961 resulted in a high growth in literacy (227 per cent) during this decade. However, in comparison to other Sectors, the Industrial Area continued to have a low proportion of literates (27.09 and 58.67 per cent in 1961 and 1971 respectively).

Sector 27 registered the lowest rate of growth in literacy in this category (136 per cent). About 65 per cent of its population was registered as literate in 1961, which increased to about 73 per cent in 1971. This Sector, developed with private and
government housing, was the only Sector in this category exceeding its target population in 1971.

iii) Areas of Low Growth (From 77 to 134 per cent)

This category comprises of Sectors 9, 20, 22, 16, 23, 7 and 2 in order of their rates of growth which varied between 133 and 77 per cent in Sectors 9 and 2 respectively. All the Sectors in this category, excluding Sector 20, also recorded a low rate of population growth. Sector 9 had an above average proportion of literates in both 1961 and 1971. Its proximity to the educational zone in Sectors 10, 11, 12 and 14 and to the City Centre, Sector 17, and its structure as a low density high income group area, contributed to its recording the highest growth in literacy amongst the Sectors in this category. Sectors 20, 22 and 23 were among the first Sectors to be developed in the city with a predominance of public housing for government employees. These were planned as high density areas. The limited extent of public housing, a high rate of occupancy and a low rate of population growth are the main associations of the low rate of growth in literacy in these Sectors. This low growth continued in the next decade as well, although the proportion of literates in these Sectors continued to be high. Sectors 16, 7 and 2 also had high levels of literacy in 1961 (77.69, 74.31 and 73 per cent respectively), and like other Sectors in this category, recorded a low rate of growth in literacy.

iv) Areas of Very Low Growth (Less than 77 per cent)

This category comprises of Sectors 19, 26, 14, 3, 5 and 4 in order of their rates of growth which varied between 72 and 31 per cent in Sectors 19 and 4 respectively. These six Sectors also registered a low rate of population growth during this decade. Among these, Sectors 3, 4 and 5 were planned as low density high income group areas, Sector 14 housed the Panjab University and its campus, and Sector 19 has a predominance of government housing. The proportion of literates in these Sectors in 1961 was above the city average of 60.57 per cent. In comparison, the low growth in literacy in Sector 26 could be associated with the location of wholesale markets and the goods transport area. This Sector had a low proportion of literates in 1961 as well as in 1971 (52.9 and 57.43 per cent respectively).

During this decade, the Peripheral Areas of the city, comprising of temporary hutments in Sectors 14, 26 and 30, and near the Railway Station, recorded a 287 per cent
growth in literacy. However, the proportion of literates continued to be very low, 23 per cent in 1961 and 33.8 per cent in 1971. Such low levels of literacy in the peripheries are a general characteristic of Indian cities.

Three Sectors, 1, 6 and 17 recorded a decline in their literacy by 95, 77 and 13 per cent respectively during this decade. These Sectors also registered a decline in their population during 1961-71. The decline in literacy and the total population may be associated with the shifting out of labourers after the completion of construction activities. This is suggested by the fact that, inspite of such declines, the proportion of literates in Sector 17, for example, improved from 37.82 per cent in 1961 to 67.93 per cent in 1971. An increase in the proportion of literates also occurred in Sectors 1 and 6.

An inverse relationship between the level of literacy in 1961 and the growth of literacy during 1961-71 can be observed in eighteen of the total of twenty-nine Sectors in the city. Of these eighteen, eight Sectors had low literacy values in 1961, but recorded a high rate of increase during the decade. A majority of these Sectors had educational institutions with housing facilities or public housing. The exceptions were Sectors 15 and 25. The former developed with predominantly private housing, but enjoyed vicinal location to educational areas, the latter had the lowest proportion of literates in the city in 1961, and despite a high growth during 1961-71 due to small base of literates in 1961, continued to have a low proportion of literates in 1971, the fourth lowest in the city. Ten Sectors had high levels of literacy in 1961, but recorded low growth rates during 1961-71. Most of these Sectors had government and private housing for high income groups (Sectors 2, 3, 4, 7, 16) as well as for middle and lower income groups (Sectors 19, 20, 22, 23). The exception was Sector 14, housing the Panjab University and its campus. The early development and high rate of occupancy in these Sectors were the main contributing factors to the high proportion of literates in 1961 and low growth during 1961-71.

In comparison to the above mentioned eighteen Sectors, five Sectors (numbers 8, 11, 18, 21, and 27) registered a high proportion of literates in 1961 as well as a high growth during 1961-71. With the exception of Sector 11, which was planned as a low density Sector, all the other Sectors were medium density areas. All of these, including Sector 11, have a predominance of private housing. An additional three Sectors (numbers
CHANDIGARH CITY
Growth in Literacy
1971-81
(Data by Sectors)

Fig. 40
5, 9, and 26) had a low proportion of literates in 1961 and also registered a low growth during the decade. Among these, Sectors 5 and 9 were planned as low density high income group areas, and Sector 26 as a low density area with wholesale commerce and goods transport function. The three Sectors that registered a decline in literacy during the decade (1, 6, 17) had low levels of literacy in 1961. All three have institutional functions.

**Growth in Literacy (1971-81)**

During 1971-81, the average rate of growth in literacy in Chandigarh city was 79 per cent. In 1971, 61.30 per cent of the population was enumerated as literate. This improved to 68 per cent in 1981. While the new Phase II Sectors registered the highest growth in literacy during this decade, a majority of the older Phase I Sectors recorded decelerating rates of growth.

On the basis of the spatial patterns of growth in literacy during 1971-81, four types of areas can be identified (Fig.40):

- Areas of Very High Growth (More than 501 per cent)
- Areas of High Growth (From 55 to 501 per cent)
- Areas of Low Growth (From 31 to 55 per cent)
- Areas of Very Low Growth (Less than 31 per cent)

1. **Areas of Very High Growth (More than 501 per cent)**

   This category comprises of Sectors 37, 32, 36, 33, 38, 34, 35, 26, 47 and the Industrial Area in order of their rates of growth which varied between 32700 per cent in Sector 37 and 504 per cent in the Industrial Area. All the Sectors in this category, excluding Sector 26 and the Industrial Area Phase I, comprise the Second Phase of the city's development. These Sectors had a small base of literate population in 1971, which increased rapidly following their development. The Industrial Area recorded a very high growth in literacy (504 per cent), probably due to the development of the Industrial Area Phase II. However, despite a higher rate of increase, it recorded a decline in the proportion of literates, from 58.67 per cent in 1971 to 47.74 per cent in 1981. This suggests a greater increase of informal and industrial workers. The high growth in literacy in Sector 26 (536 per cent) during this decade was related to the establishment of a number of educational institutions in this Sector. However, this increase was offset by the high increase in its population (853 per cent). The proportion of literates in this
Sector decreased from 57.43 per cent in 1971 to 38 per cent in 1981. The increase in population was prompted by an expansion of wholesale trade and bulk transport functions, and the presence of slums, squatter settlements and labour colonies attracted by its peripheral location.

ii) Areas of High Growth (From 55 to 501 per cent)

This category comprises of Sectors 31, 1, 30, 25, 6, 29, 17, 7, 10 and 15 in order of their rates of growth which varied between 473 and 56 per cent in Sectors 31 and 15 respectively. The high growth in Sector 31 was associated with its development as a new Phase II Sector.

Five Phase I Sectors in this category (numbers 1, 30, 6, 17, and 7) recorded a higher growth in literacy during this decade as compared to the previous decade. The increase in Sector 30 may be related to the expansion of such institutions as the CSIO and the Indo-Swiss Training Centre (ISTC) and housing for their employees. Similarly, the high growth in literacy in Sector 7 was related to an expansion in housing. The proportion of literates in this Sector increased from 73.5 per cent in 1971 to 78.45 per cent in 1981. In comparison, the high growth in Sectors 1 and 6, housing the Capitol Complex and the Governors' Residences, may be related to certain administrative developments. The proportion of literates in Sector 1 increased from 47.6 per cent in 1971 to 56.09 per cent in 1981. However, the reverse was true in Sector 6, where the proportion of literates declined from 52.63 per cent in 1971 to 23.07 per cent in 1981. In Sector 17, housing the City Centre, the proportion of literates declined, from 67.93 per cent in 1971 to 58.82 per cent in 1981, inspite of the high rate of increase in literacy during this decade. Since this Sector registered a high rate of population growth during 1971-81, the decrease in the proportion of literates suggests a greater increase in persons employed in the informal sector and those not requiring literacy skills.

In Sectors 25, 29, 10 and 15, the growth in literacy during this decade was sluggish as compared to the one recorded during the previous decade. In Sector 25, specifically, the deceleration could be related to the proliferation of slums and squatter settlements. However, due to the expansion of housing for Panjab University employees in this Sector, the proportion of literates increased from 18.71 per cent in 1971 to 28.32 per cent in 1981. In Sector 29, the addition of EWS housing probably contributed to the
comparatively sluggish growth in literacy, since, inspite of a high rate of increase in population, the proportion of literates improved only marginally from 62 per cent in 1971 to 62.65 per cent in 1981. In comparison, Sectors 10 and 15 registered an improvement in the proportion of literates, from 72.7 and 77.9 per cent respectively in 1971 to 80 and 79.3 per cent respectively in 1981. The comparatively higher rate of increase in Sector 10 (75 per cent) may be associated with the location of a number of educational institutions with hostels in this Sector. The proximity to such institutional Sectors as numbers 14 and 12 seems to be the main contributing factor for the high growth in literacy in Sector 15.

iii) *Areas of Low Growth (From 31 to 55 per cent)*

This category comprises of Sectors 11, 24, 28, 12, 4, 21, 20, 16 and 5 in order of their rates of growth. The growth among these Sectors varied between 50 and 32 per cent in Sectors 11 and 5 respectively. All the Sectors in this category developed during the First Phase of the city’s development. These Sectors also registered an overall low population growth during this decade. Further, excluding Sector 4, the rate of growth in literacy in these Sectors was lower as compared to the previous decade. This conforms to the trend of sluggish growth following an initial rapid increase. Since these Sectors include those which developed with institutional and government housing (Sectors 12, 20, 24, and 28), private housing (Sectors 4, 16, and 21), as low density high income group areas (Sectors 4, 5, 11, and 16) and high density medium and low income group areas (Sectors 20, 21, 24, and 28), the main association for the low growth in literacy is more with the stage of development of a Sector rather than its nature.

iv) *Areas of Very Low Growth (Less than 31 per cent)*

This category comprises of Sectors 8, 22, 23, 9, 18, 27, 14, 19 and 3 in order of their rates of growth which varied between 30 and 8 per cent in Sector 8 and 3 respectively. In all the Sectors, the rate of growth in literacy during this decade was lower as compared to the previous decade. In case of Sectors 8, 9, 18, 19 and 3, the sluggish growth was accompanied by a marginal decline in the proportion of literates. In comparison, in Sectors 14, 22, 23 and 27, inspite of a decelerating rate of growth in literacy, the proportion of literate persons improved considerably and formed 78 to 84 per cent of the total population in 1981. For example in Sector 14, an institutional Sector, the proportion
of literates increased from 79.8 per cent in 1971 to 84.68 per cent in 1981, the highest in the city.

During this decade, only Sector 2, registered a decline in literacy by 3 per cent. There was a decline in its total population, density as well as workforce. Interestingly, while there was an absolute decline in the number of literates by 15 persons during 1971-81, the proportion of literates increased from 75.42 per cent in 1971 to 81.43 per cent in 1981. This implies a shifting out of illiterate persons, possibly informal workers and labourers from this Sector. The Peripheral Areas of Chandigarh also registered a decline in literacy during this decade (by 20.68 per cent). The proportion of literates remained stable at about 34 per cent in 1971 and 1981. The Peripheral Areas also registered a population decline (by 21.32 per cent) during this decade.

During this decade, an inverse relationship between the level of literacy at the beginning of the decade and the rate of growth during the decade was observed in thirty out of the thirty-eight Sectors in the city. Fifteen Sectors had a high proportion of literates in 1971, but recorded a low growth during 1971-81. These Sectors were developed during Phase I of the city's developments with institutional, government and high income group housing. Their early development implied limited expansion in later years. Another fifteen Sectors had a low proportion of literates in 1971, but recorded a high growth during 1961-71. These Sectors included eleven new Phase II Sectors. The four Phase I Sectors in this category were institutional areas with associated housing facilities.

In comparison to the above mentioned thirty Sectors, four Sectors (numbers 15, 10, 7, and 17) had a high proportion of literates in 1971 and also registered a high growth in literacy during the decade. With the exception of Sector 17, the City Centre, the other three were residential Sectors located in close proximity to important work areas. An additional four Sectors had a low proportion of literates and also recorded a low growth in literacy. All these four Sectors developed partly or wholly with institutional housing.

**Growth in Literacy (1981-91)**

During this decade, the proportion of literates in Chandigarh city increased from 68 per cent in 1981 to 70 per cent in 1991. The city maintained its position as one of the
CHANDIGARH CITY
Growth in Literacy
1981-91
(Data by Sectors)

Fig. 41
most literate cities in India. However, the rate of growth in literacy was only 39 per cent, as compared to 79 per cent during the previous decade and 168 per cent during 1961-71. A decelerated rate of growth in literacy was also registered in twenty-nine Phase I Sectors. In comparison, the highest growth in literacy in the city was recorded in the new Phase II Sectors (numbers 39 to 46) (Fig.41). These were enumerated for the first time in 1981. This was in conformity with the trend of high rates of growth during the initial decade of development.

On the basis of the decadal rates of growth in literacy in various Sectors of the city during 1981-91, four types of areas can be identified (Fig.41):

(i) Areas of Very High Growth (more than 875.50 per cent)
(ii) Areas of High Growth (from 47.89 to 875.50 per cent)
(iii) Areas of Low Growth (from 14.50 to 47.89 per cent)
(iv) Areas of Very Low Growth (Less than 14.50 per cent)

i) **Areas of Very High Growth (More than 875.50 per cent)**

This category comprises of Sectors 41,42,46,39,44,45 and 43, located along the southern periphery of the city (Fig.41). All of these developed in Phase II of the development of the city. The growth in literacy among these Sectors varied between 52,711 and 1380 per cent in Sectors 41 and 43 respectively. The very high growth in these Sectors was associated with their recent settlement. Enumerated for the first time in 1981, they had a small population and, likewise, a small base of literate population. Consequently, with development and expansion in housing facilities and work areas, their population increased at a high rate during 1981-91, yielding a very high growth in all the socio-economic attributes, including literacy. For instance, Sector 41, which recorded a phenomenally high literacy growth (52,711 per cent), had only 19 literate persons in 1981 which increased to 10034 literates in 1991; Sector 45, which registered a growth of 1877 per cent, had only 434 literate persons in 1981 which increased to 8579 literates in 1991. The proportion of literates in all these Sectors was more than the city average (70 per cent) in 1991. In Sector 39, for example, 86.28 per cent of population were registered as literate, the second highest in the city. The presence and proximity to new work areas within these Sectors (colleges, offices, other institutions) as well as on their peripheries
(Mohali, Industrial Area, Air Force Base) acted as an important factor in the rapid growth of literacy in these Sectors.

ii) **Areas of High Growth (From 47.89 to 875.50 per cent)**

   This category comprises of Sectors 40, 38, 32, 47, 36, 3, 37 and 33 in order of their rates of growth which varied between 371 and 48 per cent in Sectors 40 and 33 respectively. All the Sectors in this category, excluding Sectors 40 and 3, had registered higher rates of growth in literacy during the previous decade. Sector 40, a new Phase II Sector, was enumerated for the first time in 1981. In comparison, Sector 3, an older Phase I Sector and located along the northern periphery of the city, was one of the two Phase I Sectors to register a higher growth in literacy during this decade (51 per cent) as compared to the previous decade (8 per cent). This was probably related to a higher rate of occupancy in the Legislators Flats and Hostels located in this Sector. In 1981, 71 per cent of its population was registered as literate. This figure improved to 79.13 per cent in 1991.

   The lower rates of growth in literacy during this decade as compared to the previous decade in other Sectors in this category were in conformity to the now familiar trend of decelerating growth after an initial rapid increase. These Sectors (numbers 38, 32, 47, 36, 37, and 33) had developed earlier in Phase II of Chandigarh’s development, in proximity to such important work areas as the Government Medical College, the Regional Institute of English, Survey of India, the Cooperative Training Institute (all located in Sector 32), undergraduate colleges in Sectors 32 and 36, Haryana government offices in Sector 33, the first city sub-centre in Sector 34 and the Air Force Base, Industrial Area and Mohali on their peripheries. In spite of a decelerated rate of increase in literacy, the proportion of literates in these Sectors in 1991 was higher than the city average of 70 per cent.

iii) **Areas of Low Growth (From 14.50 to 47.89 per cent)**

   This category comprises of the Industrial Area, Sectors 25, 34, 29, 24, 31, 12 and 28 in order of their rates of growth in literacy which varied between 40 and 15 per cent in the Industrial Area and Sector 28 respectively. The Sectors in this category form two compact areas, Sectors 12, 24 and 25 in the west and Sectors 28, 29, and 31 and the Industrial Area in the east of the city (Fig.41). Only Sector 34 appears as an isolated
patch. All the Sectors in this category recorded substantially lower growth rates in literacy during this decade as compared to the previous decade.

Although the Industrial Area and Sector 34 recorded the highest (40 per cent) and third highest (32 per cent) growth in literacy respectively in this category, there was a decline in the proportion of literates in these. Specifically, while 47.7 per cent of the population of the Industrial Area was literate in 1981, only 38.37 per cent were registered as literate in 1991. For Sector 34, the decrease was from 76.59 per cent in 1981 to 72.35 per cent in 1991. This decline in the proportion of literates may be associated with the presence of low grade and unskilled labourers in the Industrial Area, and with informal sector workers in Sector 34, the first city sub-centre. Both these areas registered an increase in population during this decade.

Sectors 25, 24 and 12 also registered low rates of growth of population. However in Sectors 24 and 12, which developed with institutional housing, the proportion of literates was above the city average in 1991 inspite of a low rate of growth in literacy. In comparison, Sector 25 had the lowest proportion of literate population in the city in 1991 (29.6 per cent), associated with the slum and labour colonies located in this Sector.

Among Sectors 28, 29 and 31, located adjacent to the Industrial Area, the former two Sectors had recorded the highest growth in literacy in the city during 1961-71. The low rates of growth during 1981-91 in these Sectors and Sector 31 were in accordance with the general trend of decelerating rates of growth during successive decades. Inspite of the low growth rates in literacy, the proportion of literates in these Sectors increased between 1981 and 1991, from 70.7 to 76.8 per cent in Sector 28, from 62.6 to 70.7 per cent in Sector 29 and from 60.48 to 63.7 per cent in Sector 31.

iv) Areas of Very Low Growth (Less than 14.5 per cent)

This category comprises of Sectors 30, 35, 2, 5, 9, 19 and 11 in order of their rates of growth which varied between 14 and 0.38 per cent in Sectors 30 and 11 respectively. All the Sectors in this category, excluding Sector 2, recorded a lower growth in literacy during this decade as compared to the previous decade. Sector 2 had registered a decline in literacy during the previous decade. However, during 1981-91, it registered a growth of 6 per cent but the proportion of literates in this Sector declined from 81.4 per cent in
1981 to 76.8 per cent in 1991. In Sector 5 also there was a decline in the proportion of literates, from 64 per cent in 1981 to 63.4 per cent in 1991. Since both Sectors 2 and 5 registered a growth in their populations during 1981-91, it may be assumed that the increase comprised mainly of an illiterate population, possibly informal workers.

Sectors 30 and 35, which registered the highest (14 per cent) and second highest (13 per cent) growth in literacy respectively in this category, had recorded substantially higher rates during 1971-81 (281 and 610 per cent respectively). These Sectors also registered a very low growth in population during this decade. This conforms to the trend of decelerating growth after an initial rapid increase. Inspite of the low growth in literacy, the proportion of literates in these Sectors was high (75 per cent in Sector 30 and 81.5 per cent in Sector 35) due to the presence of institutions (CSIO, ISTC) and proximity to work areas located in Phase II. Sectors 9, 19 and 11 registered growth rates of only 2.1 and 0.38 per cent respectively, the lowest in the city during 1981-91. These Sectors also registered a decline in their populations during this decade. However, the proportion of literates in these Sectors increased considerably, suggesting the moving out of the illiterate segment of the population. In 1991, Sector 11, which registered the lowest growth rate in the city, had the highest proportion of literates (86.5 per cent) in the city.

The Peripheral Areas of the city, comprising of Labour, EWS and Milkmen Colonies, recorded a 748 per cent growth in literacy during 1981-91. This was associated mainly with the inclusion of new areas in the 1991 census. However, inspite of the substantial rate of increase, the proportion of literates was fairly low. 46.5 per cent in 1991.

Areas of Decline

As many as seventeen Sectors recorded a negative rate of growth in literacy during 1981-91. The rate of decline varied between 85 per cent in Sector 1 and 2 per cent in Sector 8. All the Sectors registering a decline in literacy constituted Phase I Sectors (Fig.41). All these Sectors also recorded a decline in their population during this decade. On the basis of the rates of decline, four types of areas can be identified (Fig.41):

(i) Areas of Very High Decline (More than 26 per cent)

(ii) Areas of High Decline (From 12 to 26 per cent)
(iii) Areas of Low Decline (From 8.50 to 12 per cent)
(iv) Areas of Very Low Decline (Less than 8.50 per cent).

i) Areas of Very High Decline (More than 26 per cent)

This category comprises of Sectors 1, 26, and 6 in order of their rates of decline which varied between 85 and 61 per cent in Sectors 1 and 6 housing the Capitol Complex and Governors' Residences respectively. These also registered a high rate of decline in population during this decade. However, while the proportion of literates in Sector 1 declined from 56.09 per cent in 1981 to 32.07 per cent in 1991, it increased from 23.07 per cent in 1981 to 34.14 per cent in 1991 in Sector 6. These changes in the proportion of literates may be associated with the shifting in or out of some literate population, particularly the security personnel. In Sector 26, housing the wholesale market and goods transport area, the rate of decline in literacy was 80 per cent. However, the proportion of literates in this Sector increased from only 38.3 per cent in 1981 to 78.4 per cent in 1991, mainly due to the removal of temporary hutments from this Sector to the adjoining Sector 26 East and East extension.

ii) Areas of High Decline (From 12 to 26 per cent)

This category comprises of Sectors 4, 22, 17, 27, and 23 in order of their rates of decline which varied between 25 and 12 per cent in Sectors 4 and 23 respectively. These Sectors also registered a decline in their populations. In Sectors 4 and 17, there was also a decline in the proportion of literates, from 67.2 per cent in 1981 to 66 per cent in 1991 in the former and from 58.5 per cent in 1981 to 53.38 per cent in 1991 in the latter. This may be associated with the moving out of a large number of literate persons, particularly the security personnel from these Sectors.

In comparison, in Sectors 22, 27, and 23, despite the decline in literacy, the proportion of literates improved, probably due to the moving out of illiterate population.

iii) Areas of Low Decline (From 8.50 to 12 per cent)

This category comprises of Sectors 21, 7, 14, 20, and 10 in order of their rates of decline which varied between 11 and 9.65 per cent in Sectors 21 and 10 respectively. All these Sectors also registered a decline in population as well. Inspite of the decline, the proportion of literates in these increased between 1981 and 1991. In 1991, it was 80 per cent or more of an individual Sector's population.
iv) **Areas of Very Low Decline (Less than 8.50 per cent)**

This category comprises of Sectors 16, 18, 15 and 8 in order of their rates of decline which varied between 7 and 2 per cent in Sectors 16 and 8 respectively. Inspite of this decline, the proportion of literates in all these Sectors increased between 1981 and 1991.

In keeping with the trend of an inverse relationship between growth rates during the decade and the level of literacy at the beginning of the decade, as many as nineteen Sectors had a high proportion of literates in 1981, but registered a low growth rate during 1981-91. In fact, twelve of these nineteen Sectors registered a decline in literacy during 1981-91. In addition, eleven Sectors having a low proportion of literates in 1981, registered a high rate of increase during 1981-91. All of these were developed during Phase II. Thus, thirty out of the forty-six Sectors recorded a rate of growth inverse to the level of literacy at the beginning of the decade. Only four Sectors which had a high proportion of literates in 1981 also registered a high rate of growth during 1981-91. In comparison, twelve Sectors recorded a low level of literacy in 1981 and a low growth during 1981-91. These twelve included eleven Phase I Sectors.

**Literacy Patterns (1991)**

According to the 1991 Census, 70 per cent of the city’s population was registered as literate. The growth in literacy during 1961-91 was 563.19 per cent. Interestingly, no Sector, including the ones registering a negative rate of growth in the number of literates, recorded a decline in the proportion of literates between 1961 and 1991.

On the basis of the spatial pattern of distribution of literates in 1991, four types of areas can be identified (Fig.42):

(i) **Areas of Very High Literacy (More than 80.57 per cent)**

(ii) **Areas of High Literacy (From 78.97 to 80.57 per cent)**

(iii) **Areas of Low Literacy (From 71.37 to 78.97 per cent)**

(iv) **Areas of Very Low Literacy (Less than 71.37 per cent)**

i) **Areas of Very High Literacy (More than 80.57 per cent)**

This category comprises of Sectors 11, 39, 14, 43, 19, 36, 10, 35, 33, 21,15 and 16 in order of their proportion of literates which varied between 86.56 and 81 per cent in Sectors 11 and 16 respectively. The most prominent cluster of Sectors having a high
The proportion of literates is formed by the educational zone and its adjoining areas located on the western periphery of the city (Sectors 10, 11, 14, 15, and 16) (Fig.42). Sector 11 maintained its position as the city’s most literate Sector in 1991 as well. The other Phase I Sectors in this category (numbers 19 and 21) had a high proportion of literates in 1961 as well. The high proportion of literates in the Phase II Sectors in this category (numbers 39, 43, 36, 35, and 33) was associated with the presence of institutions within these Sectors and in the adjoining ones, for example, government offices (Sector 33), undergraduate colleges with hostels (Sector 36), multistoried housing for HIG and MIG (Sectors 39), the second city sub-centre (Sector 43) and proximity to Mohali and the Industrial Area.

ii) **Areas of High Literacy (From 78.97 to 80.57 per cent)**

This category includes Sectors 23, 46, 44, 40, 27, 22, 7, 8, 18, 20 and 3 in order of their proportion of literates which varied between 80.57 per cent in Sectors 23 and 46 and 79.13 per cent in Sector 3. Among these, the high proportion of literates in three new Phase II Sectors may be associated with their proximity to Mohali, the Industrial Area and the Air Force Base. The Phase I Sectors in this category adjoin areas of very high literacy (Fig.42). In 1961 also these Sectors had a high proportion of literates.

iii) **Areas of Low Literacy (From 71.37 to 78.97 per cent)**

This category comprises of Sectors 45, 37, 26, 12, 47, 28, 2, 41, 30, 34, 38 and 9. The proportion of literates among these varied between 78.82 per cent in Sector 45 and 71.37 per cent in Sector 9. It must be pointed out that although these Sectors are grouped as areas of low literacy, the proportion of literates in each of these is above the city average of 70 per cent in 1991. The new Phase II Sectors in this category (numbers 41 and 45) include two Outgrowths (Buterla, Badheri) and a Census Town (Burail) respectively. This and the presence of LIG/EWS houses could have contributed to the lower proportion of literates in these as compared to other Phase II Sectors. Among the Phase I Sectors in this category are Sectors with institutional housing (numbers 12, 28, and 30) and those planned as high income low density areas (numbers 2 and 9).

iv) **Areas of Very Low Literacy (Less than 71.37 per cent)**

This category comprises of Sectors 24, 29, 42, 32, 4, 31, 5, 17, the Industrial Area, Sectors 6, 1 and 25 in order of their proportion of literates which varied between 71 and 29.62 per cent in Sectors 24 and 25 respectively. In the three Phase II Sectors
42.32, and 31) the low proportion of literates can be attributed to the presence of LIG/EWS housing. The prominent Phase I Sectors in this category include the city’s main work areas Sector 17, (the City Centre), and Sector 1, (the Capitol Complex). Both these are largely non-residential areas. Similarly, the low proportion of literates in Sector 6, housing the Governors’ Residences, is related to the restricted housing facilities in this Sector. Among the other Phase I Sectors in this category, Sector 24, which developed with institutional housing, had a low proportion of literates in 1961 as well. Similarly, Sector 25 had the lowest proportion of literates in 1961 also. This was related to the presence of slums and labour colonies located in this Sector.

4. WORK FORCE

The workforce or ‘active’ population is comprised of all those who are engaged in remunerative occupations both physical and mental and those who seek a livelihood in such occupations (7). Chandigarh was planned, designed and developed to perform the administrative function. It is, at present, the administrative headquarters of three units. In addition, Chandigarh has also developed into an important regional centre of education, business, commerce and professional services. Consequently, a considerable portion of the workforce is employed in various categories of government services and other tertiary occupations. The availability of a large market and infrastructure in Chandigarh has also promoted the growth of many auxiliary functions in Mohali, Panchkula and other nearby places. Many of the workers engaged in the performance of these functions actually reside in Chandigarh. The proportion of workers in the total population of the city in 1961, 1971, 1981 and 1991 was 39.35, 33.33, 35 and 34 per cent respectively. This suggests an increasing dependency ratio, and implies an environment conducive for family-type living. The rate of growth in workforce, 108, 80, and 34 per cent during 1961-71, 1971-81 and 1981-91 respectively, conforms to the familiar trend of initial high growth followed by declining growth rates, already identified for other socio-economic attributes.

Distribution of Workforce (1961)

In 1961, 39.35 per cent of the city’s population was enumerated as workers. This has been the highest proportion of workers recorded in the city, and was associated with
CHANDIGARH CITY
Distribution of Workforce
1961
(Data by Sectors)

City average: 39.35 per cent

Fig. 43
the early stage of development of the city. The lack of housing and associated infrastructural facilities deterred the presence of families in large numbers in the city in 1961. The sex ratio (625 females per 1000 males) and proportion of female workers (6.78 per cent) in 1961 suggests a workforce dominated by single male workers.

On the basis of the distribution pattern of the proportion of workers in different Sectors of the city in 1961, four types of areas can be identified (Fig.43):

(i) Areas of Very High Proportion (More than 57.61 per cent)

(ii) Areas of High Proportion (From 44.76 to 57.61 per cent)

(iii) Areas of Low Proportion (From 36.06 to 44.76 per cent)

(iv) Areas of Very Low Proportion (Less than 36.06 per cent)

i) **Areas of Very High Proportion (More than 57.61 per cent)**

   This category includes Sectors 1,28, the Industrial Area, Sectors 17,29,3,4 and 2 in order of their proportion of workers which varied between 77.85 per cent in Sector 1 and 57.72 per cent in Sector 2. The Sectors in this category include the city’s main work area, the Capitol Complex (Sector 1) and the adjoining high income low density Sectors (numbers 2,3, and 4), the City Centre (number 17) and Sectors 28 and 29, located adjacent to the Industrial Area and developed with industrial housing. The very high proportion of workers in Sectors 1,17,2,3 and 4 was associated with construction activities. Interestingly, all the Sectors in this category recorded a very low sex ratio in 1961, thereby implying a dominance of single male workers.

ii) **Areas of High Proportion (From 44.76 to 57.61 per cent)**

   This category includes Sectors 6,25,9,5,10,8,26 and 30 in order of their proportion of workers which varied between 57.50 per cent in Sector 6 and 44.76 per cent in Sector 30. Most of the Sectors in this category are located in the northern part of the city and adjoining the Sectors with very high values (Fig.43). The high proportion of workers in most of these Sectors was related to their early stage of development. In comparison, the high proportion of workers in Sector 25 (57.48 per cent) was related to the presence of slums and squatters. The location of the wholesale trade area in Sector 26 was the main contributing factor to the high proportion of workers in this Sector.

iii) **Areas of Low Proportion (From 36.06 to 44.76 per cent)**

   This category includes Sectors 18,24,15,20,16,12,21 and 14 in order of their
CHANDIGARH CITY
Growth in Workforce
1961-71
(Data by Sectors)

Per cent
164.90
85.90
58.75

Enumerated for the first time in 1971
City average: 108 per cent

Fig. 44
proportion of workers which varied between 43.38 per cent in Sector 18 and 36.52 per cent in Sector 14. The Sectors in this category form two contiguous areas, one in the western and the other in the south-central part of the city (Fig.43). This category includes residential Sectors located in close proximity to major work areas (Sectors 18,24,15,20,16 and 21). These Sectors recorded moderately high sex ratios in 1961. The low proportion of workers in Sector 14 was related to the development of institutional housing.

iv) Areas of Very Low Proportion (Less than 36.06 per cent)

This category includes Sectors 27,22,7,23,19 and 11 in order of their proportion of workers which varied between 35.6 per cent in Sector 27 and 30.42 per cent in Sector 11. This category consists of the earliest developed Sectors in the city. The development of housing and associated facilities promoted family-type living in these and resulted in a low proportion of workers. These Sectors registered very high sex ratios in 1961.

Growth in Workforce (1961-71)

Of the 39.35 per cent of population enumerated as workers in the city in 1961, 93.22 per cent were males and 6.78 per cent were females. The corresponding figures for 1971 were 33.33 per cent workers, of which 91.63 per cent were male workers and 8.37 per cent were female workers. The rate of increase in the workforce during 1961-71 was 108 per cent. The high growth in workforce during 1961-71 was associated with the early stage in the settlement of the city, the availability of jobs in construction activities and the Reorganization of Punjab State in 1966. The highest growth in workforce during this decade was registered in Sector 29 (14,070 per cent) and the lowest (6.37 per cent) in Sector 5. Interestingly, the four institutional Sectors (numbers 1,6,14, and 17) recorded a decline in workforce during this decade.

On the basis of the decadal variation in the rate of growth in workforce among various Sectors of the city, four types of areas can be identified (Fig.44):

(i) Areas of Very High Growth (More than 164.9 per cent)
(ii) Areas of High Growth (From 85.9 to 164.9 per cent)
(iii) Areas of Low Growth (From 58.75 to 85.9 per cent)
(iv) Areas of Very Low Growth (Less than 58.75 per cent)
i) *Areas of Very High Growth (More than 164.9 per cent)*

This category comprises of Sectors 29, 28, 21, 15, 24 and 25 in order of their rates of growth which varied between 14070 per cent in Sector 29 and 175 per cent in Sector 25. While Sectors 29 and 28 form the eastern margins of the city adjacent to the Industrial Area, Sectors 15, 24 and 25 form a compact area in the west of the city. Only Sector 21 appears as an isolated patch (Fig.44).

The very high growth recorded in Sectors 29 and 28 was due to their extremely small base in 1961. For instance, while there were only 10 workers in Sector 29 in 1961, this number increased to 1417 in 1971. The comparative figures for Sector 28 were 144 and 2519 workers in 1961 and 1971 respectively. The high increase may be associated with developments in housing for the industrial workers and for the lower categories of government employees. The location of Sector 15 in close proximity to such institutional Sectors as Sectors 14, 12 and 11 contributed to the high growth in workforce. This Sector developed with predominantly private housing. In comparison, in Sector 24, institutional housing was provided for the PGI employees and public housing for the lower ranked government employees. The low sex ratio in both these Sectors (721 and 674 females per 1000 males in Sectors 15 and 24 respectively) suggests a predominantly male population. The peripheral location of Sector 25, reserved for providing additional housing for the adjoining Panjab University, and proximity to areas of employment for menial and domestic jobs, particularly in the University and the PGI, resulted in the development of slums and squatter settlements. Sector 21, developed with private housing, recorded a growth of 438 per cent in workforce during this decade.

All the Sectors in this category, irrespective of their function and type of housing, recorded a very high growth in their population as well during this decade.

ii) *Areas of High Growth (From 85.9 to 164.9 per cent)*

This category comprises of Sectors 11, 8, 18, 7, 12 and 27 in order of their rates of growth in workforce which varied between 156 per cent in Sector 11 and 86 per cent in Sector 27. All the Sectors in this category also registered a high growth in population during this decade. Among the Sectors in this category, Sector 11 developed mainly with private housing. It also has two undergraduate colleges with hostel facilities located in it. Sector 12 houses the PGI, the Engineering and the Architecture colleges and their hostels.
and campuses. The high growth in workforce in these Sectors was related to their functional nature and to the small workforce base in 1961. In comparison, in case of Sectors 8 and 18, developed mainly with private housing, the proximity to major work areas, such as Sectors 1 and 17, seems to be the main contributing factor for the high growth in workforce. Similarly in Sectors 7 and 27, developed with both private and public housing, the high growth in workforce may be attributed mainly to the presence of government employees.

iii) **Areas of Low Growth (From 58.75 to 85.9 per cent)**

This category comprises of Sectors 22, 16, 20, 10, 23, 30 and 9 in order of their rates of growth which varied between 85.81 per cent in Sector 22 and 60 per cent in Sector 9. Locationally, Sectors 22, 16, 10, 23 and 29 form a conspicuous crescent adjoining the City Centre in Sector 17 (Fig.44). The low growth in workforce in these Sectors may be attributed to an early development of housing (government and private) which promoted family-type living. In comparison, Sector 30 developed mainly with institutional housing, the campus of the Central Scientific Instruments Organization (CSIO).

iv) **Areas of Very Low Growth (Less than 58.75 per cent)**

This category comprises of Sectors 2, 19, 26, 4, 3, the Industrial Area, and Sector 5 in order of their rates of growth which varied between 57.57 per cent in Sector 2 and 6.37 per cent in Sector 5. All the Sectors in this category also registered a very low rate of population growth during this decade.

All the Sectors in this category, except Sector 19, had a high proportion of workers in 1961. Among these, Sectors 2, 3, 4 and 5 developed as high income group low density Sectors. The low rate of growth in workforce in these was associated with their limited housing and potential for employment. The same factor seems to have operated in Sector 19 also, one of the earliest Sectors to develop as a middle income high density area in the city. The proportion of workers in Sector 19 was low in 1961 and remained so in 1971 as well. In comparison, in Sector 26 and the Industrial Area, the proportion of workers was already high in 1961 and continued to be so in 1971 also. This was related to their functional character. Interestingly, all the Sectors in this category had low sex ratios in 1961 and 1971, implying the dominating presence of single male workers.
The Peripheral Areas of Chandigarh, comprising temporary hutments in Sectors 14, 26 and 30 and near the Railway Station, registered a growth of 107.30 per cent in workforce during 1961-71. In 1961, 48.24 per cent of the population was enumerated as workers. However, in 1971, this proportion declined to 39.4 per cent.

Four Sectors (numbers 1, 6, 17 and 14) recorded a decline of 95, 94, 71 and 8 per cent respectively during this decade. These Sectors developed as institutional areas housing the Capitol Complex (Sector 1), the Governors’ Residences (Sector 6), the City Centre (Sector 17) and the Panjab University and its campus (Sector 14). While Sectors 1, 6 and 17 registered a decline in all the demographic attributes, including population growth, Sector 14 recorded the lowest population growth (26.81 per cent) during 1961-71. Thus, in these the decline in workforce was accompanied by a low or declining population growth.

During this decade, an inverse relationship between the proportion of workforce in a Sector at the beginning of the decade and its growth rate during the decade was observed in twenty out of a total of twenty-nine Sectors. Out of these twenty, eleven Sectors had very high or high proportion of workers in 1961, but registered low or even negative rates of growth during the decade. Most of these Sectors were either institutional or high income low density Sectors. The other nine Sectors had a low proportion of workers in 1961 but registered high rates of growth during 1961-71. Most of these nine Sectors developed as low or medium density Sectors with a predominance of private housing.

In addition to these twenty Sectors, four Sectors had a high proportion of workers in 1961 and also registered high growth rates during 1961-71. The main association of the high growth rates in these Sectors was with their location near specific work areas, namely the Industrial Area, the Capitol Complex and the Panjab University. In comparison, five Sectors which had a low proportion of workers in 1961 also registered low growth rates during 1961-71. These Sectors were among the first to be developed in the city with a predominance of either government or institutional housing as medium density Sectors.
CHANDIGARH CITY
Growth in Workforce
1971-81
(Data by Sectors)

Per cent

- 323
- 62
- 35

Enumerated for the first time in 1981

City average: 80 per cent

Figures outside the circle indicate per cent

Fig. 45.
Growth in Workforce (1971-81)

During 1971-81, the number of workers in the city increased at the rate of eighty per cent. The proportion of workers in the total population increased from 33.3 per cent in 1971 to 35 per cent in 1981. The 1981 Census categorized workers into main and marginal workers, depending upon the period of employment. In 1981, Chandigarh enumerated 812 marginal workers, which constituted only 0.21 per cent of the total population and 0.61 per cent of the total workforce. The high growth in workforce and the increase in the proportion of workers during this decade was associated with the development of nine new Phase II Sectors (numbers 31 to 38 and 47) and the Phase II Industrial Area. This decade was also marked by the development of two townships on the periphery of Chandigarh, Mohali (SAS Nagar) and Panchkula, promoted by the Punjab and Haryana Governments respectively.

On the basis of the growth in workforce in various Sectors of the city, four types of areas can be identified (Fig.45):

(i) Areas of Very High Growth (More than 323 per cent)
(ii) Areas of High Growth (From 62 to 323 per cent)
(iii) Areas of Low Growth (From 35 to 62 per cent)
(iv) Areas of Very Low Growth (Less than 35 per cent)

i) Areas Very High Growth (More than 323 per cent)

This category comprises of Sectors 37,38,6,30, the Industrial Area, Sectors 17,26,35,47 and 32 in order of their rates of growth in workforce which varied between 14989 per cent in Sector 37 and 324.55 per cent in Sector 32. Most of the Sectors in this category are located on the southern margins of the city (Fig.45). These are middle class residential Sectors. In addition, Sector 17, housing the City Centre, Sector 6, housing the residences of the Governors of Punjab and Haryana and their administrative staff, and Sector 26, housing the wholesale and bulk transport area, have restricted housing. Sectors 37,38,35,47 and 32 constitute the new Phase II Sectors and, in conformity to the trend of initial high growth rates, registered very high growth in workforce as well as in other socio-economic attributes. Interestingly, in Sectors 38,35,47 and 32, inspite of the high rate of increase in workforce, the proportion of workers declined between 1971 and 1981, suggesting a greater increase in the number of non-working population. For
instance, 43.2 per cent of the population of Sector 38 was enumerated as workers in 1971, while it declined to 34.36 per cent in 1981. The comparative figures for Sectors 47 and 32 were 20.59 and 48.90 per cent in 1971 respectively and 15.64 per cent and 35.17 per cent respectively in 1981. This decrease in the proportion of workers in these Sectors could be related to the developments and expansion in housing, prompting families to move into these Sectors and resulting in a lower proportion of workers.

The development of Industrial Area Phase II prompted a very high growth in the total workforce (488 per cent) of the Industrial Area. However, here also the proportion of workers declined from 55 per cent in 1971 to 43.40 per cent in 1981, possibly due to an increase in dependent population.

The four Phase I Sectors which registered a very high growth in workforce (numbers 6,30,17, and 26) were developed as institutional areas. Sectors 6 and 17 had recorded a decline in workforce during the previous decade. The very high growth in workforce in these Sectors during this decade may be associated with some temporary developments, because in the following decade, both these Sectors were again to register a decline in workforce. However, in 1981 these two Sectors had the highest proportion of workers (71.15 per cent in Sector 6 and 75.75 per cent in Sector 17) in the city. Sector 26 had registered a very low growth in workforce during the previous decade. During 1971-81, the development of its functions (wholesale commerce and bulk goods transport) and a proliferation of slums and squatter settlements resulted in a very high growth in workforce (420 per cent) in this Sector. The proportion of workers also increased from 39.1 per cent in 1971 to 41.27 per cent in 1981. The very high growth in Sector 30 (531 per cent) was associated with the expansion of the existing institutions, namely the C.S.I.O. and the Indo-Swiss Training Centre. However, the addition of private and EWS housing resulted in a decline in the proportion of workers in this Sector, from 36.19 per cent in 1971 to 32.16 per cent in 1981.

ii) **Areas of High Growth (From 62 to 323 per cent)**

This category comprises of Sectors 34.1,33,29,25,36,7,31 and 15 in order of their rates of growth in workforce which varied between 308 per cent in Sector 34 and 63 per cent in Sector 15. Except for Sectors 1 and 15, the Sectors in this category adjoin those registering very high rates of growth, and along with them form a contiguous area of high
growth rate in workforce on the southern margin of the city (Fig.45). In Sectors 34,33,36,31, the new Phase II Sectors in this category, as in many other new Phase II Sectors, the proportion of workers, inspite of a high rate of growth in workforce, declined appreciably at the end of the decade, mainly due to developments in housing which promoted family type living. Among the five Phase I Sectors in this category, Sector 1 housing the Capitol Complex, had registered a decline in workforce during the previous decade. The growth in workforce and the proportion of workers during this decade was probably related to some temporary developments such as construction activity, since in the following decade this Sector was to record a negative rate of growth in workforce. In Sectors 29,25,15 and 7, the growth in workers was associated with the developments in housing, particularly for EWS in Sector 29 and resettlement of some slums in Sector 25. Interestingly, the high growth in workforce in Sector 25 was despite the fact that much of the Sector was still to be developed.

iii) Areas of Low Growth (From 35 to 62 per cent)

This category comprises of Sectors 11, 8, 5,18,16,22,21,10 and 12 in order of their growth rates in workforce which varied between 57 per cent in Sector 11 and 35.36 per cent in Sector 12. The rate of growth in most of these Sectors was lower during this decade as compared to the previous decade. In accordance with the now familiar trend of decelerating rates of growth, all the Sectors in this category were to record a negative growth in workforce during the following decade.

iv) Areas of Very Low Growth (Less than 35 per cent)

This category comprises of Sectors 23,19,9,28,24,14, 20 and 27. The growth rate in these varied between 29.39 per cent in Sector 23 and 14.11 per cent in Sector 27. All the Sectors in this category also recorded a low growth in population during this decade. Further, excluding Sector 14, all the Sectors registered comparatively lower rates of growth in workforce during this decade as compared to the previous decade. This is in conformity with the general trend already identified. In fact, Sectors 23,9,14,20 and 27 were to register negative rates of growth in workforce during the following decade. Most of the Sectors in this category developed in Phase I with a predominance of government or institutional housing. The only exception was Sector 9, which developed as a high income low density Sector with private housing. In all of these, the high level of
development seems to have been the main contributing factor. However, inspite of the low rates of growth, there was an increase in the proportion of workers in Sectors 23, 19, 9, 20 and 27 between 1971 and 1981.

During this decade, Sectors 2, 4 and 3 registered negative rates of growth in workforce (35.89, 8.19 and 4.14 per cent respectively). Interestingly, only Sector 2 registered a concomitant decline in population during this decade. The decline in workforce in Sectors 4 and 3 may be associated with an increase in the number of dependents. The Peripheral Areas of Chandigarh comprising temporary hutsments in Sectors 14, 26, 30 and near the Railway Station in 1971 and the Resettlement Colonies of Dadu Majra, Korsan and Ram Darbar in 1981 also recorded a decline in workforce (by 31.14 per cent) during this decade. This was also accompanied by a decline in population (by 21.32 per cent). The proportion of workers in these areas was 34.43 per cent in 1981 as compared to 39.4 per cent in 1971.

An inverse relationship between the proportion of workers in a Sector at the beginning of the decade and the rate of growth during the decade was observed in eleven out of a total of thirty-eight Sectors in the city. Out of these eleven Sectors, six had a high proportion of workers in 1971 but registered low or even negative growth rates during 1971-81. All of these were high income low density areas with public and private housing. An additional five Sectors had a low proportion of workers at the start of the decade but registered high rates of growth during 1971-81. All of these had a predominance of private housing and were developed as medium and high density Sectors. Two of these five Sectors were Phase II Sectors.

In addition to these eleven Sectors, thirteen had a high proportion of workers in 1971 and also registered high rates of growth during the decade. Out of these thirteen, seven were new Phase II Sectors with a predominance of private housing and planned as medium density Sectors. The remaining six were either institutional Sectors with a specific function, for example, the Capitol Complex, the City Centre, wholesale trade and transport function or high income low density Sectors. An additional fourteen Sectors, all developed during Phase I, had a low proportion of workers at the start of the decade and also registered low rates of growth during the decade. Most of these had a predominance of government or institutional housing and were planned as high and
CHANDIGARH CITY
Growth in Workforce
1981-91
(Data by Sectors)
X Lahore
Khuda Jassu
X
Dhanas
r/West of Sector 25
Dadu Majra

Per cent
216.88
64.00
19.48
Increase
7.20
Decrease
10.10
16.00
City average: 34 per cent

Boundaries:
Town
Sector
Sector number
Census town
Out growth
EWS, labour and milkmen colonies

Fig. 46
medium density areas. Many of these were to register a negative rate of growth during the next decade.

**Growth in Workforce (1981-91)**

The growth in workforce in the city during this decade was at the rate of 34 per cent, substantially lower than the 108 per cent and 80 per cent growth recorded during 1961-71 and 1971-81 respectively. At the end of the decade, the proportion of workers in the city decreased marginally from 35 per cent in 1981 to 34 per cent in 1991. The low rate of growth in workers in the city during this decade may be associated with the development of a conducive residential environment that Chandigarh provides for family-type of living, and its development into a major educational centre, attracting a substantial number of students from the surrounding areas. The work participation rate of the female population in the city increased from 6.78 per cent in 1961 to 15.23 per cent of the total workers in 1991, implying a favourable environment and avenues for female employment in the city. Notable among the disparities in the 34 per cent growth in workforce in the city are the extremely high growth rates recorded by eight new Phase II Sectors (numbers 39 to 46) and the negative growth recorded by 23 Phase I Sectors.

On the basis of the variations in the growth rates in workforce during this decade, four types of areas can be identified in the city (Fig.46): 

(i) **Areas of Very High Growth (More than 216.88 per cent)**

(ii) **Areas of High Growth (From 64 to 216.88 per cent)**

(iii) **Areas of Low Growth (From 19.48 to 64 per cent)**

(iv) **Areas of Very Low Growth (Less than 19.48 per cent)**

**i) Areas of Very High Growth (More than 216.88 per cent)**

This category comprises of Sectors 42, 41, 46, 44, 47 and 40 in order of their rates of growth in workforce which varied between 6836.36 per cent in Sector 42 and 216.89 per cent in Sector 40. All the Sectors in this category were located on the southern margin of the city (Fig.46). Most of these also recorded a very high growth of population during this decade.

All the Sectors in this category, except Sector 47, were enumerated for the first time in 1981. Their recent settlement and a small base of workers at the start of the decade contributed to the high rates of growth in workforce. The proximity of these
Sectors to work areas on the periphery of Chandigarh (Industrial Area, Mohali, Air Force Base) and in the other Phase II Sectors (sub-city centre in Sector 34, Medical College in Sector 32, undergraduate colleges and offices etc.), and the availability of housing acted as additional factors. Interestingly, in spite of the high rate of growth in workforce, the proportion of workers in these Sectors declined in 1991. The decline could be associated with developments in housing, prompting an increase in the number of dependents. Sectors 42 and 41, which recorded the highest and second highest growth in workforce in the city as well as in this category, include the Census Town of Attawa and the Outgrowths of Buterla and Badheri respectively. The proportion of workers in Sector 47, a Phase II Sector developed during the last decade, improved from 15.64 per cent, the lowest in the city in 1981, to 30.22 per cent in 1991. This was associated with its proximity to the Air Force Base, Mohali and the Industrial Area.

ii) Areas of High Growth (From 64 to 216.88 per cent)

This category comprises of Sectors 45, 03, 43, 39, 38, 32 and the Industrial Area in order of the rates of growth in workforce which varied between 204.48 per cent in Sector 45 and 64 per cent in the Industrial Area. Except Sector 3, these Sectors, located on the southern margins of the city, along with the Sectors registering very high rates of growth, form a contiguous area (Fig.46). All the Sectors in this category, excluding Sector 3, were developed during Phase II. In Sectors 45, 43 and 39, which were enumerated for the first time in 1981, the high growth in workforce, as in other socio-economic attributes, was associated with their recent settlement, small workforce base in 1981, the presence of work areas within these and their proximity to Mohali and the Industrial Area. Sector 45, which recorded the highest growth in workforce in this category, also included the Census Town of Burail. However, in spite of a high rate of growth in workers during this decade, the proportion of workers in these Sectors declined appreciably between 1981 and 1991. As in many other Sectors, the developments in housing, especially in the form of blocks of flats, prompted the moving in of families, thereby offsetting the increase in the number of workers. The three areas developed earlier during Phase II, Sectors 32, 38 and the Industrial Area, recorded a lower growth in workforce during this decade as compared to the previous decade. This conforms to the general trend of decelerating growth rates following an initial rapid growth. The
development of HIG and EWS housing in Sector 38, and institutional (GMC, SOI, RBI) and EWS housing in Sector 32 led to a decline in the proportion of workers in these Sectors in 1991.

Only one Phase I Sector, 3, registered a high rate of growth in workforce. During the previous decade it had registered a negative growth. A higher occupancy of flats and hostels for the legislators, located within this Sector, and the posting of security personnel seem to be the main contributing factors to the high rate of growth. The proportion of workers in this Sector also increased from 39.31 per cent in 1981 to 64.81 per cent in 1991, the second highest among all the Sectors in the city. This Sector, however, recorded a low rate of growth in population during this decade.

iii) Areas of Low Growth (From 19.48 to 64 per cent)

This category comprises of Sectors 34, 36, 31, 37, 33 and 24 in order of their rates of growth in workforce which varied between 59.01 per cent in Sector 34 and 19.48 per cent in Sector 24. All these Sectors adjoin areas of higher rates of growth, and except Sector 24, were developed in Phase II (Fig.46). All the Sectors in this category recorded a lower growth in workforce during this decade as compared to the previous decade. This conforms to the general trend observed earlier. The low growth in workforce in these Sectors was mainly associated with additional developments in housing, private, EWS and HIG. However, the proportion of workers in these Sectors increased between 1981 and 1991, in association with the development of such work areas as the city sub-centre in Sector 34, and institutions, banks and organizations in other Sectors. The proximity to Mohali and the Industrial Area also contributed to an increase in the number of workers in these Sectors.

iv) Areas of Very Low Growth (Less than 19.48 per cent)

Sectors 28,30,29,35 and 19 recorded a growth rate of less than 19.48 per cent in workforce during this decade. The growth rates varied between 11.76 per cent in Sector 28 and 3.27 per cent in Sector 19. Among these, Sectors 19,28,29 and 30 developed during Phase I. The latter three Sectors, adjoining the Industrial Area, form a compact block (Fig.46). The Sectors in this category recorded a lower rate of growth in workforce during this decade as compared to the previous decade. This was in conformity to the trend noted earlier. The Phase I Sectors in this category had developed mainly with
government housing (Sectors 19, 28, 29) and institutional housing (Sector 30). Their early development had resulted in a limited scope for further expansion. The changes in the proportion of workers in these between 1981 and 1991 were marginal, rarely exceeding one per cent increase or decrease, and reflected the very low rates of growth.

The Peripheral Areas of Chandigarh, comprising Labour, EWS and Milkmen Colonies recorded a very high growth rate of 516 per cent in workforce. These areas registered a very high rate of population growth as well (521 per cent). The proportion of workers in these areas remained at 34 per cent in 1991 also.

**Areas of Decline**

Twenty-three Sectors recorded a decline in workforce during this decade. All of these had developed during Phase I, and conform to the general trend of an initial rapid growth, followed by sluggish growth and ultimately, a decline. Out of these twenty-three Sectors, nineteen Sectors also recorded a decline in population during this decade.

On the basis of the rates of decline in workforce, four types of areas can be identified in the city (Fig. 46):

(i) **Areas of Very High Decline (More than 16 per cent)**

(ii) **Areas of High Decline (From 10.10 to 16 per cent)**

(iii) **Areas of Low Decline (From 7.20 to 10.10 per cent)**

(iv) **Areas of Very Low Decline (Less than 7.20 per cent)**

**i) Areas of Very High Decline (More than 16.00 per cent)**

This category comprises of Sectors 26, 6, 4, 22, 17 and 10 in order of their rates of decline which varied between 91.37 per cent in Sector 26 and 16.54 per cent in Sector 10. Locationally, these occur along the northern margin of the city, with an extension to the south along an institutional Sector (number 10), the City Centre (number 17) and one of the first residential Sectors to develop in the city with predominantly government housing (Sector 22) (Fig. 46).

Among the Sectors in this category, Sector 26, which recorded the highest rate of decline in workforce, also registered the highest rates of decline in population density and Scheduled Castes population and the second highest decline in literacy during this decade. This decline in the above attributes in general and in workforce in particular was associated with the removal and relocation of slums and squatter settlements from this...
Sector to Sector 26 East and East extension. The proportion of workers in this Sector declined from 41.27 per cent in 1981 to 35.49 per cent in 1991. The decline in workforce in such institutional Sectors as 10, 6 and 17 was associated with temporary developments. These Sectors had recorded a higher growth in workforce during the previous decade.

Since all these Sectors had developed at an early stage, the decline in workforce reflected the limited possibility of expansion or apportioning in the existing housing facilities.

ii) **Areas of High Decline (From 10.10 to 16 per cent)**

This category comprises of Sectors 5, 7, 27, 21, 23 and 18 in order of their rates of decline in workforce which varied between 13.16 per cent in Sector 5 and 10.14 per cent in Sector 18. Locationally these Sectors adjoin those registering a higher decline in workforce (Fig.46). The decline in workforce in all these Sectors followed the sluggish growth registered during the previous decade and reflected the general population decline, associated with a saturation of the existing housing facilities and a possible movement to the new Phase II Sectors.

iii) **Areas of Low Decline (From 7.20 to 10.10 per cent)**

This category comprises of Sectors 8, 15, 1, 12, 9 and 16. The decline in these Sectors varied between 9.90 per cent in Sector 8 and 7.24 per cent in Sector 16. The decline in workforce in all these Sectors during this decade was preceded by a sluggish growth during the previous decade. The decline in workforce in many of these Sectors was accompanied by an overall population decline. An exception within this category was Sector 12, which recorded a decline in workforce and the proportion of workers despite a growth in population during this decade. This may be associated with the presence of institutional housing in this Sector.

iv) **Areas of Very Low Decline (Less than 7.2 per cent)**

This category comprises of Sectors 14, 25, 2, 11 and 20. The rate of decline among these varied between 6.11 per cent in Sector 14 and 0.55 per cent in Sector 20. The decline in workforce in Sectors 14, 11 and 20 was also accompanied by a population decline during this decade. The proportion of workers, however, increased marginally in Sector 14 owing to its being a major work area, and in Sector 20, possibly due to the shifting out of entire families and not only workers. In comparison, Sectors 25 and 2...
CHANDIGARH CITY
Distribution of Workforce
1991
(Data by Sectors)
recorded a low population growth during 1981-91. The decline in workforce may be associated with an increase in the number of dependants.

During this decade, an inverse relationship between the level of workforce in 1981 and its rate of growth during 1981-91 was observed in seventeen out of a total of forty-six Sectors in the city. Out of these seventeen Sectors, fourteen had a high proportion of workers at the start of the decade, but registered low or even negative rates of growth during the decade. All these fourteen Sectors had developed during Phase I, as low and medium density areas, to perform specific institutional functions. The other three Sectors, developed during Phase II, had a low proportion of workers in 1981, but registered a high rate of growth during 1981-91. These had a predominance of private housing and were developed as medium and high density Sectors. All these three Sectors had locational advantages to newly developed work areas in and near the city.

Nine Sectors had a high proportion of workers in 1981 and also registered a high rate of growth during 1981-91. All of these, except Sector 3, developed during Phase II as medium or high density Sectors. An additional twenty Sectors had a low proportion of workers in 1981 and also registered low or even negative rates of growth during 1981-91. These twenty included fifteen Sectors developed during Phase I and five developed during Phase II. The low or negative rates of growth in these Sectors conform to the trend of decelerating rates of growth following initial rapid growth.

Distribution of Workforce (1991)

In 1991, 34 per cent of the population of the city was enumerated as workers. The rate of growth of workforce during 1961-91 was 396.68 per cent, the lowest among the various socio-economic attributes. This indicates an environment conducive to family-type living. The low proportion of workers was also associated with a large student population residing in Chandigarh. Interestingly, the female workforce constituted 15.23 per cent of the total workforce. This is indicative of the positive environment provided by the city for female participation.

On the basis of the proportion of workers in various Sectors in the city in 1991, four types of areas can be identified (Fig.47):

(i) Areas of Very High Proportion (More than 35.72 per cent)
(ii) Areas of High Proportion (From 33.94 to 35.72 per cent)
(iii) Areas of Low Proportion (From 32.57 to 33.94 per cent)
(iv) Areas of Very Low Proportion (Less than 32.57 per cent).

i) Areas of Very High Proportion (More than 35.72 per cent)

This category includes Sectors 17,3,6,1,42, the Industrial Area, Sectors 5,16,19,18,22 and 34 in order of their proportion of workers which varied between 66.76 per cent in Sector 17 and 35.73 per cent in Sector 34. Locationally, these Sectors occupy the central part of the city with an east-west extension on the northern margin (Fig.47). This category includes only two Phase II Sectors, 34 and 42. The former has the first city sub-centre for commerce and other city centre activities, and the latter includes the Census Town of Attawa within it. This category also comprises (i) the city’s main work areas – Sector 17, the City Centre, Sector 6, the Governors’ Residences, Sector 1, the Capitol Complex and Sector 22, an important commercial area, and (ii) some of the earliest developed Sectors in the city, such as Sectors 16,18 and 19. The proportion of workers in Sectors 17 and 22 increased in comparison to that of 1961. Sector 17 had a high proportion of workers in the city in 1961 also, as did the Sectors on the northern margins of the city (Fig.43). The pattern of a high proportion of workers in the central, early developed parts of the city is similar to the one identified for evolved towns.

ii) Areas of High Proportion (From 33.94 to 35.72 per cent)

This category includes Sectors 26,23,7,21,24,8,44,20,15,27 and 43. The proportion of workers among these varied between 35.49 per cent in Sector 26 and 34.17 per cent in Sector 43. This category includes only two new Phase II Sectors, 44 and 43. The latter is being developed as the second city sub-centre, and a second ISBT is also proposed in this Sector. Locationally, the Phase I Sectors almost completely encircle the areas of higher proportion of workers (Fig.47). As compared to the distribution of workers in the city in 1961, this pattern suggests a southward shift (Figs.43 and 47). Except for Sector 26, which houses a number of institutions and the wholesale trade and bulk transport area for the city, these Sectors are residential areas, enjoying proximity to different work areas and developed at an early stage, with different types of housing for different income groups.

iii) Areas of Low Proportion (From 32.57 to 33.94 per cent)

This category comprises of Sectors 37,33,41,25,46,45,30,38,32.39 and 36 in order
of the proportion of workers which varied between 33.72 per cent in Sector 37 and 32.57 per cent in Sector 36. All the Sectors in this category, excluding Sectors 5 and 30, were developed in Phase II and are located in the southern part of the city (Fig.47). A high intensity of development of small-sized plots and multistorey housing has contributed to a large population but a lower proportion of workers in these Sectors. Interestingly, many of these Sectors had a high proportion of workers in 1971 when these were at an early stage of development.

iv) **Areas of Very Low Proportion (Less than 32.57 per cent)**

This category comprises of Sectors 31,2,40,28,11,14,4,47,29,12 and 10 in order of their proportion of workers which varied between 32.27 per cent in Sector 31 and 26.88 per cent in Sector 10. Locationaly, these extend along the eastern margins of the city and also form a contiguous area in the north-west of the city (Fig.47). The former area comprises of Sectors meant for housing industrial workers (Sectors 28,29) and institutional housing (Sectors 31 and 47). The latter north-west area comprises the educational zone having undergraduate colleges and hostels (Sectors 10,11), the PGI, the Architecture and the Engineering colleges and their campuses (Sector 12) and the Panjab University and its campus in Sector 14. All the Phase I Sectors in this category had a lower proportion of workers in 1991 as compared to 1961.

5. **SCHEDULED CASTES POPULATION**

The presence of the Scheduled Castes is a characteristic feature of the Indian society. The concept of categorizing society on the basis of division of labour is believed to have been introduced about two thousand years ago. The four classes identified according to this concept were *Brahmins, Kshatriyas, Vaishyas and Shudras* (8) Of these, the *Shudras*, traditionally associated with lowly economic and menial activities not requiring any formal training or education, largely make up the Scheduled Castes population in India today. The communities considered to be constituting these were included in a schedule drawn up by the Government of India in 1950, and hence the term ‘Scheduled Castes’. Despite various efforts for their economic and social upliftment, the Scheduled Castes continue to form the lower strata of society. The availability of jobs, largely menial, in construction, industries and the informal sector has prompted the
CHANDIGARH CITY
Distribution of Scheduled Castes
1961
(Data by Sectors)

Per cent

City average: 8.5 per cent

Fig. 48
presence of the Scheduled Castes population in urban areas, particularly in the large
cities. The traditional association of this segment of population with menial, unskilled
and informal activities suggests that as a city grows, there would be an increase in the
proportion of this section of the population as well.

The Scheduled Castes population has formed an increasing proportion of
Chandigarh's population since the inception of the city. It increased from 8.50 per cent
in 1961 to 15.88 per cent in 1991, recording a growth rate of 967.73 per cent during
1961-91. Specifically, the growth in the Scheduled Castes population was 182.83 per
cent during 1961-71, 123.29 per cent during 1971-81 and 69.06 per cent during 1981-91.
In comparison, the growth of population in the city has been at a much lower rate,
144.89, 73.56 and 34.47 per cent during 1961-71, 1971-81 and 1981-91 respectively. In
absolute terms, the Scheduled Castes population in the city has increased from 7,597

Distribution of Scheduled Castes (1961)

In 1961, the Scheduled Castes formed only 8.5 per cent of Chandigarh’s
population. The availability of large scale employment in construction activities must
have been the main contributing factor for their presence. Interestingly, Sectors with a
high proportion of Scheduled Castes population were generally located on the peripheries
of the city, particularly towards the north, east and west (Fig.48). Inspite of the early
stages of development of the city in 1961, their distribution resembled the pattern
observed in evolved towns.

On the basis of the spatial distribution of Scheduled Castes population in 1961,
four types of areas can be identified in the city (Fig.48):

(i) Areas of Very High Proportion (More than 13.80 per cent)
(ii) Areas of High Proportion (From 5.68 to 13.80 per cent)
(iii) Areas of Low Proportion (From 2.59 to 5.68 per cent)
(iv) Areas of Very Low Proportion (Less than 2.59 per cent)

i) Areas of Very High Proportion (More than 13.80 per cent)

This category includes Sectors 24,29,28,6,1,12 and 15 in order of their proportion
of Scheduled Castes which varied from 62.69 per cent in Sector 24 and 17.41 per cent in
Sector 15. Locationally, these formed a crescent covering the eastern, northern and
western peripheries of the city (Fig.48). These were the Sectors where either construction activities were going on, or which enjoyed proximity to areas requiring unskilled labour. The former type is exemplified by Sectors 6 (Governors’ Residences), 1 (the Capitol Complex) and 12 (PGI), and in case of the latter, Sectors 24, 15, 28 and 29.

i) Areas of High Proportion (From 5.68 to 13.80 per cent)

This category includes Sectors 2, 25, the Industrial Area, Sectors 10, 14, 17, 27, 20 and 4 in order of their proportion of Scheduled Castes population which varied between 10.20 per cent in Sector 2 and 5.68 per cent in Sector 4. The high proportion of Scheduled Castes population in Sectors 2, 10, 27, 20 and 4 may be associated with construction activities, and the availability of jobs in domestic and informal sectors. The high proportion in Sector 17, the City Centre, was also related to development activities. In comparison, the availability of employment as domestic help, and the fact that Sector 14 also contained a small unauthorized colony in 1961, prompted a concentration of Scheduled Castes population in this Sector. On the other hand, the lack of any immediate plans for the development of Sector 25 led to the development of slums in this Sector. In 1961, 10.09 per cent of this Sector’s population comprised of Scheduled Castes.

iii) Areas of Low Proportion (From 2.59 to 5.68 per cent)

This category comprises of Sectors 19, 30, 18, 11, 26, 8 and 5 in order of their proportion of Scheduled Castes population which varied between 4.92 per cent in Sector 19 and 2.65 per cent in Sector 5. Locationally, most of these Sectors comprised an almost contiguous area in the eastern half of the city (Fig.48). All these Sectors were mainly residential areas, except Sector 26, a potentially attractive area, housing the wholesale market and goods transport area.

iv) Areas of Very Low Proportion (Less than 2.59 per cent)

In 1961, a large contiguous area of very low proportion of Scheduled Castes population was located in the centre of the southern margins of the city (Fig.48). It comprised of Sectors 21, 22, 23 and 16, the earliest Sectors to be developed in the city, and which had a predominance of government housing. The other Sectors in this category numbers 3, 7, and 9, were located towards the northern margins of the city. The proportion of Scheduled Castes population in these varied between 2.54 per cent in Sector 16 and 0.32 per cent in Sector 3.
CHANDIGARH CITY
Growth in Scheduled Castes
1961-71
(Data by Sectors)

Per cent
353.00
157.00
71.15
Enumerated for the first time in 1971
City average: 182.83 per cent

Figures outside the circle indicate per cent

Fig. 49
Growth in Scheduled Castes Population (1961-71)

In 1961, the Scheduled Castes comprised 8.50 per cent of the population of Chandigarh. It increased to 9.82 per cent in 1971. The rate of growth in Scheduled Castes population during 1961-71 (182.83 per cent) was high and associated with the early stage of development of the city, a small base of population, and the availability of jobs in construction activities. The Sectors registering the highest rates of growth in Scheduled Castes population during this decade were located on the peripheries of the city and in proximity to major areas of employment. Interestingly, in the first decade of its development, five Sectors in the city recorded a decline in Scheduled Castes population. All of these were either institutional Sectors or were located close to institutions.

On the basis of the rates of growth in Scheduled Castes population in various Sectors of the city, four types of areas can be identified (Fig.49):

(i) Areas of Very High Growth (More than 353.0 per cent)
(ii) Areas of High Growth (From 157 to 353.0 per cent)
(iii) Areas of Low Growth (From 71.15 to 157 per cent)
(iv) Areas of Very Low Growth (Less than 71.15 per cent)

i) Areas of Very High Growth (More than 353.0 per cent)

This category includes Sectors 29, 3, 25, 28, 05 and 21 in order of their rates of growth in Scheduled Castes population which varied between 5900 per cent in Sector 29 and 353.12 per cent in Sector 21. All the Sectors in this category were located on the then peripheries of the city in various directions (Fig.49). Sector 29 and 28, located on the eastern periphery, adjacent to the Industrial Area, already had a high proportion of Scheduled Castes population in 1961 (50 and 40.90 per cent respectively). However, inspite of the very high rate of growth during the decade, their proportion declined substantially in 1971 to 11.59 and 10.35 per cent respectively, suggesting a higher growth in the general population. In Sector 21, located on the southern periphery of the city, the high growth was associated with a small base of Scheduled Castes population in 1961. However, inspite of a high growth rate of 353.12 per cent during 1961-71, the proportion of Scheduled Castes population in this Sector decreased marginally from 1.63 per cent in 1961 to 1.19 per cent in 1971. Sector 21 developed with private housing as a medium
density area. Sector 25, which recorded a growth of 3031.46 per cent in Scheduled Castes population during this decade, had attracted slums and squatter settlements from the very beginning due to its peripheral location, undeveloped nature and proximity to major employment areas such as the University (Sector 14) and the PGI (Sector 12). In the mid 1960s, it was selected for the resettlement of an unauthorized labour colony. There was an increase in the proportion of Scheduled Castes population, from 10.09 per cent in 1961 to 75.06 per cent in 1971. Thus, unlike the Sectors mentioned above, the growth in Scheduled Castes population in Sector 25 was not accompanied by a decrease in their proportion. In Sectors 3 and 5, located on the northern periphery of the city, the very high rate of growth resulted in an increase in the proportion of Scheduled Castes population from 0.32 per cent in 1961 to 7.31 per cent in 1971 in Sector 3, and from 2.65 per cent in 1961 to 12.83 per cent in 1971 in Sector 5. The very high rates of growth in these were related to the low base of Scheduled Castes population in 1961, and with the availability of household jobs in these low density high status Sectors. However, unlike other Sectors in this category, Sectors 3 and 5 recorded a very low rate of population growth during this decade.

ii) Areas of High Growth (From 157 to 353 per cent)

This category comprises of Sectors 9,20,7,23,30 and 22 in order of their rates of growth which varied between 316 per cent in Sector 9 and 165.46 per cent in Sector 22. All the Sectors in this category, excluding Sectors 9 and 7, were located on the then southern periphery of the city (Fig.49). The high growth in Scheduled Castes population in Sectors 9 and 7 was related to a low base in 1961, and to the availability of domestic jobs. The proportion of Scheduled Castes population in both these Sectors increased from 2.4 per cent each in 1961 to 4.83 per cent and 4.26 per cent respectively in 1971. However, both these Sectors recorded a low growth in population during this decade. The high growth in Scheduled Castes population in Sectors 20,23,30 and 22 was related to their early development, the availability of jobs in domestic, institutional (Sector 30) and the commercial Sectors (Sector 22). However, inspite of a high rate of growth during the decade, and an increase in the proportion of Scheduled Castes population in 1971 as compared to 1961, these Sectors continued to be among the areas with a comparatively low proportion of Scheduled Castes population in the city.
iii) **Areas of Low Growth (From 71.15 to 157 per cent)**

This category comprises of Sectors 26,10,8,24,12,4 and 11 in order of their rates of growth in Scheduled Castes population which varied between 148.88 per cent in Sector 26 and 71.15 per cent in Sector 11. In Sector 26, located on the north-eastern periphery and housing the wholesale market and goods transport area, the proportion of Scheduled Castes population increased from 3.49 per cent in 1961 to 5.64 per cent in 1971. This Sector had only partially developed in 1971, resulting in a low growth in Scheduled Castes population and a still lower population growth.

Sector 10,11 and 12 were proposed as part of the educational zone in the city. While in the former two Sectors, educational institutions covered only a part of the Sectors, Sector 12 was entirely institutional, housing the PGI., the Engineering and the Architecture Colleges and their campuses. The limited employment opportunities in these institutions and households in these Sectors, which were yet to be developed, contributed to the low rate of increase in the Scheduled Castes population. Sector 24 had a high proportion of Scheduled Castes population (62.69 per cent) in 1961 which declined to 31.97 per cent in 1971. During this decade, the growth of population in this Sector, which developed with public and institutional housing, was at a high rate. The low rate of growth in the Scheduled Castes population in this Sector was mainly due to the limited housing available for this group as compared to the general population. In Sector 4, located on the northern edge of the city, and developed as a high income low density Sector, the absolute addition of only 19 Scheduled Castes persons during 1961-71, suggests only limited household employment. However, being a Sector with a small population, even this marginal growth resulted in an increase in the proportion of Scheduled Castes persons from 5.68 per cent in 1961 to 6.90 per cent in 1971.

iv) **Areas of Very Low Growth (Less than 71.15 per cent)**

This category comprises of Sectors 16,18,19,15 and 27 in order of their rates of growth which varied between 41.81 per cent in Sector 16 and 4.79 per cent in Sector 27. All these Sectors adjoin high income low density Sectors located to their north (Fig.49). The low growth rates in Scheduled Castes population in these Sectors were probably due to the limited housing and employment opportunities in the informal sector. In
comparison, the general population in some of these Sectors, for example, Sectors 15, 16, 18, 27, recorded higher growth rates during this decade.

The Peripheral Areas of Chandigarh, comprising temporary hutments in Sectors 14, 26 and 30 and near the Railway Station, expectedly registered a high rate of growth in Scheduled Castes population during this decade (137.7 per cent). There was also an increase in the proportion of Scheduled Castes population in these areas, from 28.88 per cent in 1961 to 39.34 per cent in 1971. This could be associated with the shifting of some of the Scheduled Castes families from various Sectors of the city to these areas, and with the presence of new migrants to the city.

An absolute decline in Scheduled Castes population was registered in Sectors 6, 1, 17, the Industrial Area, Sectors 14 and 2 during this decade. All of these, except Sector 2, developed as institutional Sectors, comprising major work areas. The decline in Scheduled Castes population in these Sectors could be related to a decline in total population (Sectors 1, 6, and 17) or to the completion of the bulk of construction work (Sectors 2 and 14) or to the poor development of the allocated function (the Industrial Area).

During this decade, an inverse relationship between the proportion of Scheduled Castes population in a Sector at the beginning of the decade and its rate of growth during the decade was observed in nineteen out of a total of twenty-nine Sectors in the city. Out of these nineteen Sectors, eleven had a high proportion of Scheduled Castes population in 1961, but experienced low rates of growth during 1961-71. Most of these Sectors had institutional functions and public housing. An additional eight Sectors had low proportions of Scheduled Castes population in 1961, but registered high rates of growth during 1961-71. Most of these had public housing for middle and low income groups or developed as high income group Sectors with private housing.

In addition to the nineteen Sectors mentioned above, four had a high proportion of Scheduled Castes population in 1961 and also registered high rates of growth during 1961-71. Among these, two were located adjacent to the Industrial Area which offered ample employment opportunities, one developed as a high density Sector with predominantly government housing for lower cadres of government employees, and one, due to its peripheral location in the vicinity of work areas, attracted slums and squatter
CHANDIGARH CITY
Growth in Scheduled Castes
1971-81
(Data by Sectors)

City average: 123.29 per cent

Fig. 50
settlements. In comparison, six Sectors had a low proportion of Scheduled Castes population in 1961 and also registered low rates of growth during 1961-71. All of these developed with predominantly private housing for middle and high income groups. Only one Sector among these had a non-residential function, wholesale trade and bulk transport, and thus the potential of offering ample employment to this segment of population. However, till 1971 this Sector had developed only partially. Although its peripheral location prompted the emergence of slum areas, the absence of any major work area in its vicinity resulted in a lower proportion of Scheduled Castes population.

**Growth in Scheduled Castes Population (1971-81)**

During this decade, even though the growth rate in Scheduled Castes population was lower (123.29 per cent) as compared to the previous decade (182.83 per cent), it continued to be much higher than the growth rate for the general population (73.56 per cent) during the same period. The proportion of Scheduled Castes persons in the city increased from 9.82 per cent in 1971 to 12.63 per cent in 1981. This vitality may be associated with the development of nine new Phase II Sectors (numbers 31 to 38 and 47) and the Phase II Industrial Area. Also during this decade, the construction of houses for the LIG and EWS, particularly in the southern Sectors, was taken up by the Chandigarh Housing Board. The expansion of existing institutions and the development of rehri and specialized markets in the Phase I Sectors also contributed to the growth of Scheduled Castes population during this decade. The highest rates of growth during this decade also were recorded in the Sectors located on either the peripheries of the city or in proximity to major work areas.

On the basis of the rates of growth in Scheduled Castes population during 1971-81, four types of areas can be identified in the city (Fig.50):

(i) **Areas of Very High Growth (More than 275 per cent)**

(ii) **Areas of High Growth (From 92 to 275 per cent)**

(iii) **Areas of Low Growth (From 43.50 to 92 per cent)**

(iv) **Areas of Very Low Growth (Less than 43.50 per cent)**

**i) Areas of Very High Growth (More than 275 per cent)**

This category comprises of Sectors 47, 26, the Industrial Area, Sectors 38,17,6.37,30,29,7 and 31 in order of their rates of growth in Scheduled Castes
population which varied between 80600 per cent in Sector 47 and 277.32 per cent in Sector 31. All the Sectors in this category, excluding the City Centre in Sector 17, were located on the peripheries of the city and formed three contiguous blocks (Fig.50). Unlike the decadal pattern of growth for other attributes, very high growth rates in Scheduled Castes population were recorded in only three Phase II Sectors, numbers 47, 38,37 and 31 (80600, 2936.2, 894.11 and 277.32 per cent respectively). This high growth was associated with their recent development, a small base of Scheduled Castes population in 1971, peripheral location, availability of jobs in construction activities, and the presence of transit settlements (Sectors 37 and 38). Sector 47 did not have any Scheduled Castes population in 1971. By 1981, there were 807 Scheduled Castes persons, constituting 9.28 per cent of the total population of this Sector. The proportion of Scheduled Castes population in Sector 38 increased from 10.8 per cent in 1971 to 28.33 per cent in 1981, and from 11.02 per cent in 1971 to 12.61 per cent in 1981 in Sector 31. In comparison, in 1971, Sector 37 had 76.57 per cent of its population enumerated as Scheduled Castes which, in spite of a high rate of increase, declined to 6.98 per cent in 1981. The increase in total population of this Sector was by 10801.80 per cent.

In Sector 26, located on the north-eastern periphery of the city, the second highest growth rate in the city in Scheduled Castes population was recorded (4186.60 per cent). The Scheduled Castes population increased from 112 persons in 1971 to 4801 persons in 1981. This was related to the development and expansion of wholesale market and goods transport functions located in this Sector. Housing for the EWS had also been provided in this Sector. In addition, it had already attracted slums and squatter settlements. The growth of population in this Sector was also very high during this decade. In fact, in 1981, the population of the Sector (18,925 persons) was far in excess of its target population (2,000 persons). However, the growth in total population (853.40 per cent) in this Sector was much lower than the growth in Scheduled Castes population (4186.6 per cent). The proportion of Scheduled Castes population in this Sector increased from 5.64 per cent in 1971 to 25.36 per cent in 1981.

The Industrial Area registered the third highest growth in Scheduled Castes population (4108 per cent) in the city, an increase from only 48 persons in 1971 to 2,020
persons in 1981. This was related to the development of the Phase II of Industrial Area. The proportion of Scheduled Castes persons in this area increased from 3.41 per cent in 1971 to 19.30 per cent in 1981.

The very high growth rates in two major institutional areas, Sector 17, the City Centre and Sector 6, housing the Governors’ Residences, were probably related to temporary developments and construction activities. In comparison, the very high growth in Sectors 29 and 30, located on the eastern periphery of the city, was related to the development of EWS housing in both these Sectors, proximity to the Industrial Area and the presence of unauthorized settlements in Sector 30. The proportion of Scheduled Castes persons in Sector 30 increased from 6.23 per cent in 1971 to 11.37 per cent in 1981, and from 11.59 per cent to 18.64 per cent in Sector 29. Sector 7, one of the most populous of the northern Sectors registered a growth of 306.66 per cent, or an absolute increase from 270 Scheduled Castes persons in 1971 to 1098 persons in 1981. This growth was probably related to an expansion in public and private housing, proximity to major work areas in the Capitol Complex and Sector 26 (wholesale trade / bulk transport area).

ii) Areas of High Growth (From 92 to 275 per cent)

This category comprises of Sectors 16, 1, 3, 18, 4, 21, 34 and 15 in order of their rates of growth in Scheduled Castes population which varied between 187.17 per cent in Sector 16 and 92 per cent in Sector 15. All the Sectors in this category, except Sector 34, were developed during Phase I of the development of Chandigarh. The rate of growth in Scheduled Castes population in Sectors 16, 1, 18, 4 and 15 was higher during this decade as compared to the previous decade. This was related to expansion in housing, availability of domestic jobs and proximity to such institutional Sectors as Sectors 11, 12 and 14. The high growth in Sector 1, housing the Capitol Complex, was related to some temporary developments since this is a non-residential Sector. Sectors 3 and 21, which had recorded one of the highest growth rates in Scheduled Castes population during the previous decade, registered comparatively lower growth during this decade. This conformed to the trend of decelerating growth after an initial rapid increase. In Sector 34, the only new Phase II Sector in this category, the growth in Scheduled Castes population (104.76 per cent) was much lower than the growth of total population (419.04
per cent) during this decade. The proportion of Scheduled Castes population in this Sector decreased from 10.25 per cent in 1971 to 4.07 per cent in 1981, probably due to the removal of unauthorized tenements from within this Sector.

iii) **Areas of Low Growth (From 43.5 to 92 per cent)**

This category comprises of Sectors 19,25,27,11,22,35,23,28 and 8 in order of their rates of growth which varied between 90.6 per cent in Sector 19 and 43.82 per cent in Sector 8 (Fig.50). Among the Sectors in this category, Sectors 19 and 27 recorded a comparatively higher growth in Scheduled Castes population during this decade as compared to the previous decade. These Sectors, along with Sectors 8 and 28, form a contiguous area of low growth in Scheduled Castes population in the east of the city, located in the vicinity of the wholesale trade and transport area in Sector 26 and the Industrial Area (Fig.50). Inspite of the low rate of growth, the proportion of Scheduled Castes population in these Sectors was higher in 1981 as compared to 1971. The proportion of Scheduled Castes population also increased in Sectors 11,22, and 23, in 1981, but continued to be lower than the city average. In comparison, although the proportion of Scheduled Castes population in Sector 25 declined from 75.06 per cent in 1971 to 56.86 per cent in 1981, it continued to be much above the city average of 12.63 per cent. This decline was associated mainly with the expansion and higher occupancy in the Panjab University campus, since during this decade, the rate of growth of total population in this Sector was high.

In Sector 35, a new Phase II Sector, the proportion of Scheduled Castes population declined from 15.48 per cent in 1971 to 4.50 per cent in 1981, mainly due to the removal of unauthorized settlements from this Sector. The total population of this Sector registered a very high rate of growth during this decade.

iv) **Areas of Very Low Growth (Less than 43.50 per cent)**

This category comprises of Sectors 12,24,14,20,32,10,2 and 9 in order of their rates of growth which varied between 42.90 per cent in Sector 12 and 0.96 per cent in Sector 9 (Fig.50). In Sector 12, an institutional Sector, the rate of growth in Scheduled Castes population was lower during this decade as compared to the previous decade. However, their proportion increased from 17.9 per cent in 1971 to 20.16 per cent in 1981, probably due to an increased availability of domestic and institutional employment.
Sectors 24, 20, 10 and 9 conform to the trend of sluggish growth following an initial high growth. Among these, Sectors 10 and 9 developed as high income low density Sectors and Sector 20 as a low and middle income Sector with predominantly government housing. All of these had a low proportion of Scheduled Castes population in 1981. In comparison, in Sector 24, developed with institutional housing mainly for employees of the PGI, this proportion was as high as 32.69 per cent.

In Sectors 14 and 2, which had recorded a decline in Scheduled Castes population during 1961-71, the increase during 1971-81 was marginal (106 and 4 Scheduled Castes persons respectively). However, even this low increase resulted in an improvement in the proportion of Scheduled Castes population in this Sector, indicating an almost stable total population.

Sector 32, a new Phase II Sector, recorded a very low growth of 15.11 per cent or an increase of 89 Scheduled Castes persons. The very high population growth in this Sector during this decade (490.28 per cent) resulted in a decline in the proportion of Scheduled Castes population from 64.3 per cent in 1971 to 12.5 per cent in 1981.

During this decade, the Peripheral Areas of Chandigarh recorded a growth rate of 67.12 per cent in their Scheduled Castes population. This was much lower than the 138 per cent growth recorded by these areas during the previous decade. Nevertheless, the proportion of Scheduled Castes population increased from 39.34 per cent in 1971 to 55.62 per cent in 1981, indicating their increased concentration on the peripheries of the city.

During this decade, a decline in the Scheduled Castes population was registered in Sectors 36, 33 and 5. The decline in two new Sectors, 36 and 33, does not conform to the trend of generally high growth recorded by new Sectors in the initial decade. Specifically, Sectors 36 and 33 recorded a negative growth of 92.41 per cent and 75.79 per cent respectively. There was also a decline in the proportion of Scheduled Castes population in these two Sectors. In Sector 36, this decline was related to the shifting out of temporary workers on the completion of construction work, and in Sector 33 to the removal of unauthorized tenements which had developed earlier within this Sector. Sector 5, a low density high status Sector, recorded a decline of 27.41 per cent or by 17 Scheduled Castes persons during 1971-81. There was also a decline in the
proportion of Scheduled Castes population, from 12.83 per cent in 1971 to 6.75 per cent in 1981.

An inverse relationship between the proportion of Scheduled Castes population at the beginning of the decade in 1971 and its growth rate during 1971-81 was observed in eighteen out of a total of thirty-eight Sectors in the city. Out of these eighteen, ten Sectors had a high proportion of Scheduled Castes in 1971 but registered low rates of growth during 1971-81. These ten Sectors included four Phase II Sectors, which had a very small base of population in 1971, most of which belonged to the Scheduled Castes. However, the rapid development of housing in these Sectors during this decade prompted a higher rate of growth of the total population. This also caused a decline in the proportion of Scheduled Castes population by the end of the decade in these Sectors. The six other Sectors, which registered a low rate of growth, were older Phase I Sectors which had predominantly institutional or government housing with limited scope for further expansion. An additional eight Sectors had a low proportion of Scheduled Castes population in 1971 but registered high rates of growth during 1971-81. All of these were well developed Phase I Sectors, with predominantly private housing. The proliferation of employment in the informal sector in these probably prompted a high rate of growth of Scheduled Castes population.

Ten Sectors having a high proportion of Scheduled Castes in 1971, also registered high rates of growth during 1971-81. These were either high income low density Sectors in the north of the city, or middle income high density Sectors in the south. The availability of institutional and domestic employment in the former and in construction and informal activities in the latter appear to be the main associated factors. Ten Sectors had a low proportion of Scheduled Castes population in 1971 and also registered low rates of growth during 1971-81. All of these were Phase I Sectors, with predominantly high income group private residences or middle income group government housing.

Growth in Scheduled Castes Population (1981-91)

The rate of growth in the Scheduled Castes population during this decade (69.06 per cent) was considerably lower than the 182.83 per cent and 123.29 per cent growth recorded during 1961-71 and 1971-81 respectively. This low rate of growth during 1981-
CHANDIGARH CITY
Growth in Scheduled Castes
1981-91
(Data by Sectors)

City average: 69.06 per cent

Per cent

84.92
28.00
12.12
7.00
17.00
45.00

Increase
Decrease

Boundaries
Town
Sector
Sector number
Census town
Out growth
EWS, labour and milkmen colonies

Fig. 51
91 was also reflected in the decline in Scheduled Castes population in sixteen Sectors in the city. However, the growth rate of 69.06 per cent for Scheduled Castes population in the city was much higher than the growth rate for the general population (34.47 per cent). The proportion of Scheduled Castes population in Chandigarh increased from 12.63 per cent in 1981 to 15.88 per cent in 1991. The highest rates of growth continued to be registered in the peripheral areas of the city, including six of the eight new Phase II Sectors developed during this decade.

On the basis of the spatial pattern of rates of growth in Scheduled Castes population, four types of areas can be identified in the city (Fig. 51):

(i) Areas of Very High Growth (More than 84.92 per cent)
(ii) Areas of High Growth (From 28 to 84.92 per cent)
(iii) Areas of Low Growth (From 12.12 to 28 per cent)
(iv) Areas of Very Low Growth (Less than 12.12 per cent)

i) Areas of Very High Growth (More than 84.92 per cent)

Sectors 39, 41, 42, the Industrial Area, Sectors 46, 45, 32, 40 and 8 registered a very high rate of growth which varied between 38800 per cent in Sector 39 and 93.75 per cent in Sector 8. Sectors 39, 41, 42, 46 and 45 had been developed during Phase II of Chandigarh’s development and their very high rates of growth in Scheduled Castes population, as in other socio-economic attributes, conform to the trend of initial rapid increase. In case of Sector 39, there were no Scheduled Castes persons in 1981. However, in 1991 there were 389 Scheduled Castes persons, accounting for 20.44 per cent of the Sector’s population. This high proportion was related to a small total population and the presence of labour colonies and slums in this Sector and on its peripheries. In case of the latter four Phase II Sectors, their peripheral location, and the presence of Census Towns (Attawa in Sector 42 and Burail in Sector 45) and Outgrowths (Buterla and Badheri in Sector 41) contributed to the very high growth rates. However, in spite of the very high rates of growth, the proportion of Scheduled Castes persons in these four Sectors declined during 1981-91, and, at the end of the decade, was lower than the city average of 15.88 per cent. This decline was associated with a higher rate of increase in general population in these Sectors. In comparison, in the Industrial Area (Phase I and II), the proportion of Scheduled Castes population increased during this
decade, and constituted 71 per cent of the total population in 1991. In conformity with its functional nature, the Industrial Area emerged as a major area of concentration of Scheduled Castes population in the city.

The very high growth of Scheduled Castes population in Sector 32 (159.29 per cent) during this decade was related to the development and expansion of such institutions as the Medical College, SOI and their associated housing, and to the development of EWS and LIG housing blocks. The proportion of Scheduled Castes population in this Sector increased from 12.53 per cent in 1981 to 17.89 per cent in 1991. In Sector 8 also, the very high growth (93.75 per cent) in Scheduled Castes population resulted in an increase in the proportion of Scheduled Castes population from 1.78 per cent in 1981 to 3.68 per cent in 1991.

ii) Areas of High Growth (From 28 to 84.92 per cent)

This category comprises of Sectors 38, 47, 36, 37, 31, 25, 2 and 16 in order of the rates of growth in Scheduled Castes population which varied between 76.09 per cent in Sector 38 and 28.57 per cent in Sector 16 (Fig.51). Although the growth rate in Scheduled Castes population in Sectors 38 and 37 was lower during this decade as compared to the previous decade, the development of EWS housing and the peripheral location resulted in an increase in the proportion of Scheduled Castes population in these Sectors. Sector 36, a high income low density Sector, located adjacent to the above mentioned two Sectors, had recorded a decline in Scheduled Castes population during the previous decade. However, despite registering a high growth rate of 47.05 per cent, the proportion of Scheduled Castes population in this Sector declined marginally from 1.41 per cent in 1981 to 1.34 per cent in 1991. This Sector had registered a high rate of growth in its population during 1981-91. The high growth in Scheduled Castes population in Sectors 47 and 31 was associated with their peripheral location in proximity to the Industrial Area and the development of LIG housing.

Sector 25, an older Phase I Sector, recorded a growth of 39.43 per cent during 1981-91. This was considerably lower than the 85.97 per cent and 3031.46 per cent growth in Scheduled Castes population recorded by it during 1971-81 and 1961-71 respectively. The presence of slums, squatter settlements and labour colonies located in this Sector since 1961 have been a major contributing factor. The proportion of
Scheduled Castes population in this Sector was 76.50 per cent in 1991. In Sector 2, a high income low density Sector with private housing, the absolute increase in Scheduled Castes population during 1981-91 was by only 13 persons. Considering the small total population, this increase was probably incidental and associated with domestic employment. In Sector 16, while there was a decline in total population (10.46 per cent), the proportion of Scheduled Castes population improved from 3.74 per cent in 1981 to 5.37 per cent in 1991. This increase may be associated with employment opportunities, particularly in the General Hospital located in this Sector.

iii) **Areas of Low Growth (From 12.12 to 28 per cent)**

This category comprises of Sectors 30,12,29,35,14,10 and 24 in order of their rates of growth in Scheduled Castes population which varied between 24.56 per cent in Sector 30 and 13.36 per cent in Sector 24. All the Sectors in this category recorded lower rates of growth during this decade as compared to the previous decade. Except for Sector 35, a Phase II Sector, all the Sectors in this category either housed institutions (Sectors 30,14,12, and 10) or developed with institutional housing (Sector 24). Also, these had developed at an early stage and therefore had limited scope for further expansion, either in housing or employment opportunities. This is reflected in the low rates of growth in Scheduled Castes population. The increase in the proportion of Scheduled Castes population in some of these Sectors was related to specific additions in housing for example, EWS housing in Sectors 29 and 30. However, the changes in the proportion of Scheduled Castes population in these Sectors were only marginal, for example, from 11.3 per cent in 1981 to 13.4 per cent in 1991 in Sector 30, and from 18.6 per cent in 1981 to 19.4 per cent in 1991 in Sector 29.

iv) **Areas of Very Low Growth (Less than 12.12 per cent)**

This category comprises of Sectors 17,43,11,20,21,44 and 27 in order of their rates of growth which varied between 10.89 per cent in Sector 17 and 2.00 per cent in Sector 27. The low rate of growth in the two new Phase II Sectors (numbers 43 and 44) was in contrast to the trend of high rates of growth in the initial decade after enumeration. These Sectors registered a very high rate of population growth during this decade.

Sectors 17,11,20,21 and 27 constitute older well developed Phase I Sectors. The limited scope for expansion in housing as well as employment in these Sectors could
have contributed to the very low rates of increase in Scheduled Castes population. In fact, these Sectors recorded a decline in total population, density, workforce and literacy during this decade.

The Peripheral Areas of Chandigarh recorded a high growth of 228.0 per cent in Scheduled Castes population during 1981-91. This was related to the enumeration of newly defined peripheral areas such as EWS and labour colonies in the surrounding villages. However, despite the high growth, the proportion of Scheduled Castes population declined in these from 55.62 per cent in 1981 to 29.38 per cent in 1991.

**Areas of Decline**

During this decade, sixteen Sectors registered a decline in Scheduled Castes population. The rate of decline varied between 97.29 per cent in Sector 26 and 2.43 per cent in Sector 28. The largest concentration of Sectors registering a decline was in the northern half of the city (Fig.51). Unlike other socio-economic attributes, where the decline almost always occurred in the older Phase I Sectors, in the case of Scheduled Castes population, there was a decline in two Phase II Sectors also (numbers 33 and 34). Further, among these sixteen Sectors, five Sectors registered a growth in population. In other words, in eleven Sectors there was a decline in the total population as well as in the Scheduled Castes population. All these eleven Sectors were developed during Phase I.

On the basis of the rates of decline in Scheduled Castes population during this decade, four types of areas can be identified (Fig.51):

(i) **Areas of Very High Decline (More than 45 per cent)**

(ii) **Areas of High Decline (From 17 to 45 per cent)**

(iii) **Areas of Low Decline (From 7 to 17 per cent)**

(iv) **Areas of Very Low Decline (Less than 7 per cent)**

**i) Areas of Very High Decline (More than 45 per cent)**

This category comprises of Sectors 26, 4, 6 and 1. All of these are located along the northern periphery of the city (Fig.51). The decline in Scheduled Castes population in these Sectors varied between 97.29 per cent in Sector 26 and 46.15 per cent in Sector 1. Sector 26, which had registered the highest growth in Scheduled Castes population in the city during 1971-81, recorded an absolute decline of 4,671 Scheduled Castes persons during 1981-91. This was related mainly to the relocation of slums, labour colonies and
other unauthorized settlements / structures to Sector 26 East and East extension from this Sector. The proportion of Scheduled Castes population in this Sector declined from 25.36 per cent in 1981 to 6.84 per cent in 1991.

Sector 4 recorded an absolute decline of 86 Scheduled Castes persons. The proportion of Scheduled Castes persons in this Sector also declined substantially from 12.39 per cent in 1981 to 0.71 per cent in 1991. This decline was probably related to a change in institutional employment in the Legislators' Hostels and Flats located in this high income group Sector. Sectors 6 and 1 had been registering fluctuating growth rates in Scheduled Castes population during the previous decades, namely, decline during 1961-71 and high growth during 1971-81. The fluctuations relate to their being institutional areas with restricted housing.

ii) Areas of High Decline (From 17 to 45 per cent)

This category comprises of Sectors 15, 18, 3, 19 and 9 in order of their rates of decline in Scheduled Castes population which varied between 33.89 per cent in Sector 15 and 17.41 per cent in Sector 9. In Sectors 15, 18, 19 and 9, located along the central axis, Madhya Marg, the absolute decline in Scheduled Castes population ranged between 340 persons in Sector 15 and 18 persons in Sector 9. The decline in Scheduled Castes population in these Sectors was also accompanied by a decline in the total population. This decline was in conformity with the trend of initial high rates of growth followed by decelerating or even negative growth. In all the five Sectors in this category, the proportion of Scheduled Castes population also declined.

iii) Areas of Low Decline (From 7 to 17 per cent)

This category comprises of Sectors 5, 33, 23 and 7. The rate of decline in these Sectors varied between 15.55 per cent in Sector 5 and 7.92 per cent in Sector 7. Due to the small rate of decline, the change in the proportion of Scheduled Castes population in these Sectors was only marginal. In Sector 5 and 33, the absolute decline in Scheduled Castes population was small, 7 persons in the former and 35 persons in the latter, and may be considered incidental. In comparison, in Sector 23 and 7, the Scheduled Castes population decreased by 101 persons in the former and 87 persons in the latter.

iv) Areas of Very Low Decline (Less than 7 per cent)

This category comprises of Sectors 22, 34 and 28. The decline in these Sectors
varied between 6.4 per cent in Sector 22 and 2.43 per cent in Sector 28. In Sector 22, the absolute decline in Scheduled Castes population was by 52 persons, which may be considered incidental. However, due to an absolute decline of 6359 persons in its total population, the proportion of Scheduled Castes persons increased marginally from 2.84 per cent in 1981 to 3.41 per cent in 1991. In Sectors 28 and 34, in comparison, the proportion of Scheduled Castes population declined during this decade. However, these Sectors recorded a growth in total population. Sector 28 continued to house a fairly high proportion of Scheduled Castes population (11.32 per cent in 1991) due to its proximity to the Industrial Area, location of the motor market, and government housing for the lower ranked employees.

During this decade, an inverse relationship between the proportion of Scheduled Castes population in 1981 and the rates of growth during 1981-91 was observed in eighteen out of a total of forty-six Sectors. Out of these eighteen, thirteen Sectors had a high proportion of Scheduled Castes population in 1981, but registered low rates of growth or even decline during the decade. Among these, eleven Sectors had developed during Phase I of Chandigarh’s development. All of these either had institutional functions or government housing for low income groups. In comparison, only five Sectors had a low proportion of Scheduled Castes population in 1981, but registered high rates of growth during 1981-91. These five Sectors included three Phase I Sectors, having institutional housing, and two Phase II Sectors, having E.W.S. housing and institutions located in them.

As many as ten Sectors had a high proportion of Scheduled Castes population in 1981, and also registered high rates of growth in it during 1981-91. With the exception of Sector 25, which has always been a major area of concentration of Scheduled Castes population in the city, all these Sectors were Phase II Sectors. Locationally, these formed two compact blocks in the south-eastern and south-western margins of the city. The location of the former could be associated with the adjoining Industrial Area (Phase II) and resettlement colonies, and that of the latter with LIG/EWS housing. Sector 25, mentioned above, also formed part of this block of Sectors. Eighteen Sectors registered a low proportion of Scheduled Castes population in 1981 and low or even negative rates of growth during 1981-91. In fact, a decline was registered in ten of these eighteen Sectors.
CHANDIGARH CITY
Distribution of Scheduled Castes
1991
(Data by Sectors)

Fig. 52

Per cent

12.18
6.67
4.01

City average: 15.88 per cent
Further, fourteen of these eighteen Sectors had developed during Phase I of the city’s development. Locationally, none of these Sectors had a peripheral location, except Sector 14, an institutional Sector. Broadly, these Sectors form a compact block with a relative inner location, and which generally coincided with the area of low proportion of Scheduled Castes population in the city in 1991.

**Distribution of Scheduled Castes Population (1991)**

In 1991, the Scheduled Castes population in the city accounted for 15.88 per cent of the total population of the city. Between 1961 and 1991, the Scheduled Castes population recorded a growth rate of 967.78 per cent, the highest among all the socio-economic attributes. This growth was associated with the availability of jobs and expansion in housing facilities. However, as in 1961, the concentration of this section of society continued to be on the peripheries of the city, suggesting an increase in the proportion of Scheduled Castes population with increasing distance from the central part of the city, a pattern generally observed in evolved towns.

On the basis of the spatial pattern of distribution of the Scheduled Castes population in 1991, four types of areas can be identified (Fig.52):

(i) Areas of Very High Proportion (More than 12.18 per cent)
(ii) Areas of High Proportion (From 6.67 to 12.18 per cent)
(iii) Areas of Low Proportion (From 4.01 to 6.67 per cent)
(iv) Areas of Very Low Proportion (Less than 4.01 per cent)

i) **Areas of Very High Proportion (More than 12.18 per cent)**

This category includes Sector 25, the Industrial Area, Sectors 1,24,38,12,39, 29,32,31,30 and 6 in order of the proportion of Scheduled Castes population which varied between 76.50 per cent in Sector 25 and 12.19 per cent in Sector 6. These Sectors form three compact areas in the west, north and east of the city (Fig.52). Within the cluster of Sectors in the west, Sector 25 had the highest proportion of Scheduled Castes population (76.5 per cent) in the city in 1991. This Sector has attracted a number of slums and squatter colonies since 1961 due to its peripheral location and lack of concrete plans for its development, although a part of it had been earmarked for the expansion of the Panjab University campus. Among the other Sectors in this cluster, Sector 24 developed with institutional housing, Sector 38 has housing for the EWS and Sector 39 for the LIG.
These three Sectors together have 17 per cent of the total Scheduled Castes population in the city.

Sectors 12, 1 and 6, forming another area of very high proportion of Scheduled Castes population in the north of the city, are institutional or public function Sectors.

The Sectors comprising the cluster on the eastern margins of the city also have housing for the poor (housing for industrial workers in Sector 29), institutional housing (Sector 30) or enjoy proximity to major work areas such as the Industrial Area or institutions located in Sector 32.

ii) Areas of High Proportion (From 6.67 to 12.18 per cent)

This category includes Sectors 20, 28, 41, 47, 7, 17, 2, 3, 14, 37, 26 and 40. The proportion of Scheduled Castes population among these varied between 11.5 per cent in Sector 20 and 6.75 per cent in Sector 40. The Sectors in this category, excluding Sector 17, the City Centre, adjoin the Sectors having very high proportions of Scheduled Castes population (Fig. 52). The Sectors in this category include such work areas as the City Centre, the Panjab University and the wholesale trade and bulk transport area. The locational associations of these Sectors are broadly the same as those of areas of very high proportion of Scheduled Castes population, that is, the availability of housing and proximity to institutional or domestic employment.

iii) Areas of Low Proportion (From 4.01 to 6.67 per cent)

This category includes Sectors 27, 45, 10, 46, 42, 43, 23, 5, 16, 19, 35 and 15 in order of their proportion of Scheduled Castes population which varied between 6.6 per cent in Sector 27 and 4.01 per cent in Sector 15. Broadly, the Sectors in this category extend from north to south in the western half of the city, and in the eastern half comprise two patches, one in the north-east (Sectors 19, 27) and the other in the south-east (Sectors 45, 46) (Fig. 52). None of the Sectors in this category comprise a major work area. Only Sectors 42 and 43 have specific housing for EWS. Thus, the only association for the presence of Scheduled Castes in these Sectors seems to be domestic or commercial employment.

iv) Areas of Very Low Proportion (Less than 4.01 per cent)

This category comprises of Sectors 33, 8, 22, 9, 44, 11, 34, 21, 18, 36 and 4 in order of their proportion of Scheduled Castes population which varied between 3.69 per cent
in Sector 33 and 0.71 per cent in Sector 4. Most of these Sectors have a relative inner location in the city (Fig.52). The largest area of very low proportion of Scheduled Castes population in the city extends from north to south almost in the centre of the city (Fig.52). The main association in these Sectors seems to be the extent of employment, particularly domestic, since these Sectors neither comprise major institutional work areas nor commercial centres.

Broadly, there has not been much change in the pattern of distribution of Scheduled Castes population since 1961, rather it has become even more accentuated.

GROWTH OF SOCIO-ECONOMIC ATTRIBUTES: BHUBANESWAR (1961-91)

The following major trends can be identified in the growth of Bhubaneswar city (i) the city’s population registered an absolute increase of 373,331 persons or 977.02 per cent during 1961-91. This incidentally was the highest growth rate among the three planned capital cities, Chandigarh, Bhubaneswar and Gandhinagar, (ii) the decadal growth rates during the three individual decades (176,108 and 87.73 per cent during 1961-71, 1971-81 and 1981-91 respectively) reveal a tapering down of population growth (Table 16), and (iii) the increase in population in absolute terms continued to be

<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Attributes</strong></td>
</tr>
<tr>
<td>----------------------</td>
</tr>
<tr>
<td>Growth of Population (per cent)</td>
</tr>
<tr>
<td>Density of Population (persons per sq.km.)</td>
</tr>
<tr>
<td>Sex Ratio (females per 1000 males)</td>
</tr>
<tr>
<td>Literacy (per cent)</td>
</tr>
<tr>
<td>Workforce (per cent)</td>
</tr>
<tr>
<td>Sch. Castes Population (per cent)</td>
</tr>
</tbody>
</table>

Note:- Figures in parentheses refer to proportions / values at the end of the decade.

<table>
<thead>
<tr>
<th>Attributes</th>
<th>1961-71</th>
<th>1971-81</th>
<th>1981-91</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density of Population (Persons per sq.km)</td>
<td>+0.30 (N.S.)</td>
<td>-0.35 (N.S.)</td>
<td>-0.53 (0.001)</td>
</tr>
<tr>
<td>Sex Ratio (females per 1000 males)</td>
<td>+0.32 (N.S.)</td>
<td>-0.25 (N.S.)</td>
<td>-0.59 (0.001)</td>
</tr>
<tr>
<td>Literacy (per cent)</td>
<td>+0.91 (0.001)</td>
<td>+0.90 (0.001)</td>
<td>+0.80 (0.001)</td>
</tr>
<tr>
<td>Workforce (per cent)</td>
<td>+0.84 (0.001)</td>
<td>+0.97 (0.001)</td>
<td>+0.78 (0.001)</td>
</tr>
<tr>
<td>Sch.Castes Population (per cent)</td>
<td>+0.20 (N.S.)</td>
<td>+0.19 (N.S.)</td>
<td>+0.48 (0.02)</td>
</tr>
</tbody>
</table>

Note:-  
1. Figures in parentheses indicate level of confidence  
2. N.S. : Not significant


Between 1961 and 1991, the density of population in Bhubaneswar city increased by 2539 persons per sq. km, from 760 in 1961 to 3299 persons per sq. km in 1991. The comparative figures for 1971 and 1981 were 1622 and 2359 persons per sq. km respectively. This increase was in spite of an increase in the area of the city, from 50.25 sq. km in 1961 to 124.74 sq. km in 1991, due to inclusion of new areas, mainly adjacent rural tracts, in the city limits. Thus the growth in density was related both to the settlement of new areas as well as infilling of existing ones.

The growth in sex ratio between 1961 and 1991 was by 59 females per 1000 males. However, the sex ratio in 1961, 1971, 1981, and 1991 has been fairly low (693, 724, 756, and 752 females per 1000 males respectively).

The literate population in the city registered a growth rate of 1081.69 per cent or an absolute increase of 263,512 literate persons during 1961-91. This rate of growth was higher than that of the total population during the same period (977.02 per cent). In 1961, the literate population comprised 63.75 per cent of the total population. This
proportion increased to 70 per cent in 1991, the same as that for Chandigarh city in 1991. The rate of growth in literacy, as in the case of population growth, decelerated during successive decades (Table 16).

As compared to the growth of both the literate and total population, the growth in workforce was low during 1961-91 (831.66 per cent). In 1961, workers comprised 37.64 per cent of the total population of the city. From 1971 onwards, as in Chandigarh, the proportion of workers has remained around one-third of the city’s population, growing at successively lower rates during subsequent decades.

Despite recording a very high growth of 1032.47 per cent during 1961-91, the Scheduled Castes population in Bhubaneswar accounted for only 8 per cent of the total population in 1991. The comparative figure for 1961 was also 8 per cent. The Scheduled Castes constituted 15 per cent of both Chandigarh and Gandhinagar’s population in 1991.

The trend of successively lower rates of population growth in Bhubaneswar and its similarity to the growth in population in Chandigarh has already been noted. However, while in the case of Chandigarh, a similar trend could also be identified for all the socio-economic attributes of population, in Bhubaneswar, this does not cover population density and Scheduled Castes population. These two attributes registered a lower rate of increase during 1971-81 and a higher growth during 1981-91.

The association between patterns of population growth and those of various socio-economic attributes in Bhubaneswar can be identified from Table 17. Among the various attributes, the strongest correlation is between population growth, growth in literacy and in workforce. This is not unexpected, considering the functional nature of Bhubaneswar. A similar correlation has also been identified for Chandigarh (Table 12). Similarly, the positive correlation with Scheduled Castes population is on expected lines, expect for its lower values and insignificance during 1961-71 and 1971-81. The correlations between growth of population and that of density and sex ratio do not follow the patterns identified for Chandigarh. In the case of density of population, the correlation was positive but weak and not significant during 1961-71, weak, negative and not significant during the next decade and, most importantly, negative, fairly strong and highly significant for the last decade. This could be taken as representing the nature of planning for Bhubaneswar, for example, emphasis on horizontal growth or even gaps in
the planning proposals. In any case, this aspect needs to be understood in greater detail. The correlation between growth of population and that of sex ratio in Bhubaneswar is similar to the one observed for growth in density (Table 17). The weak correlation in Bhubaneswar probably reflects Orissa's low urban sex ratio.

The pattern of correlation observed from Tables 17 is also broadly valid for the multi-collinearity among the growth of various socio-economic attributes given in Table 18, 19 and 20. The multi-collinearity between growth in density and other socio-economic attributes is generally weak, negative and not significant, except for its correspondence with growth in literacy during 1961-71, where it is relatively strong, positive and significant, and with sex ratio during 1981-91, where it is strong, positive and significant. In comparison, its correlation with workforce and Scheduled Castes population is strong, negative and significant during 1981-91, and is perhaps indicative of the highly nucleated spatial distribution of these attributes of population in the city. The decade 1971-81 emerges as an exception, as in the case of Chandigarh also, at least for this attribute, since there does not seem to be any significant relationship between growth in density and that of other socio-economic attributes. As observed in the case of Chandigarh, the growth in sex ratio does not necessarily follow the trends of the growth

TABLE 18: BHUBANESWAR CITY: MULTI-COLLINEARITY OF SOCIO-ECONOMIC ATTRIBUTES OF POPULATION (1961-71)

<table>
<thead>
<tr>
<th></th>
<th>Population Growth</th>
<th>Density</th>
<th>Sex Ratio</th>
<th>Literacy</th>
<th>Workforce</th>
<th>Sch.Castes Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population Growth</td>
<td>-</td>
<td>+0.30</td>
<td>+0.32</td>
<td>+0.91</td>
<td>+0.84</td>
<td>+0.20</td>
</tr>
<tr>
<td>Density</td>
<td>-</td>
<td>-0.49</td>
<td>+0.44</td>
<td>0.00</td>
<td>-0.37</td>
<td>-</td>
</tr>
<tr>
<td>Sex Ratio</td>
<td>-</td>
<td>-</td>
<td>+0.12</td>
<td>+0.32</td>
<td>+0.58</td>
<td>+0.05</td>
</tr>
<tr>
<td>Literacy</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>+0.79</td>
<td>+0.25</td>
<td>+0.22</td>
</tr>
<tr>
<td>Work force</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Sch.Castes Population</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

Note:- 1. Figures in parentheses indicate the level of confidence 2. NS = Not significant
### TABLE 19: BHUBANESWAR CITY: MULTI-COLLINEARITY OF SOCIO-ECONOMIC ATTRIBUTES OF POPULATION (1971-81)

<table>
<thead>
<tr>
<th></th>
<th>Population Growth</th>
<th>Density</th>
<th>Sex Ratio</th>
<th>Literacy</th>
<th>Workforce</th>
<th>Sch.Castes Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population Growth</td>
<td>-</td>
<td>-0.35</td>
<td>-0.25</td>
<td>+0.90</td>
<td>+0.97</td>
<td>+0.19</td>
</tr>
<tr>
<td></td>
<td>(N.S.)</td>
<td>(N.S.)</td>
<td>(N.S.)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(N.S.)</td>
</tr>
<tr>
<td>Density</td>
<td>-</td>
<td>-0.02</td>
<td>-0.13</td>
<td>-0.39</td>
<td>-0.33</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(N.S.)</td>
<td>(0.1)</td>
<td>(N.S.)</td>
<td>(N.S.)</td>
<td>(N.S.)</td>
<td></td>
</tr>
<tr>
<td>Sex Ratio</td>
<td>-</td>
<td>-0.24</td>
<td>-0.34</td>
<td>+0.18</td>
<td>+0.03</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(N.S.)</td>
<td>(N.S.)</td>
<td>(N.S.)</td>
<td>(N.S.)</td>
<td>(N.S.)</td>
<td></td>
</tr>
<tr>
<td>Literacy</td>
<td>-</td>
<td>-</td>
<td>+0.86</td>
<td>+0.25</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.001)</td>
<td>(N.S.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Workforce</td>
<td></td>
<td></td>
<td></td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sch.Castes Population</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

Note:- 1. Figures in parentheses indicate the level of confidence  
2. NS = Not significant

### TABLE 20: BHUBANESWAR CITY: MULTI-COLLINEARITY OF SOCIO-ECONOMIC ATTRIBUTES OF POPULATION (1981-91)

<table>
<thead>
<tr>
<th></th>
<th>Population Growth</th>
<th>Density</th>
<th>Sex Ratio</th>
<th>Literacy</th>
<th>Workforce</th>
<th>Sch.Castes Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population Growth</td>
<td>-</td>
<td>-0.59</td>
<td>-0.59</td>
<td>+0.80</td>
<td>+0.78</td>
<td>+0.48</td>
</tr>
<tr>
<td></td>
<td>(0.001)</td>
<td>(0.05)</td>
<td>(0.02)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.02)</td>
</tr>
<tr>
<td>Density</td>
<td>-</td>
<td>+0.51</td>
<td>-0.31</td>
<td>-0.55</td>
<td>-0.69</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.02)</td>
<td>(N.S.)</td>
<td>(N.S.)</td>
<td>(0.01)</td>
<td>(0.001)</td>
<td></td>
</tr>
<tr>
<td>Sex Ratio</td>
<td>-</td>
<td>-0.37</td>
<td>-0.64</td>
<td>-0.48</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(N.S.)</td>
<td>(0.05)</td>
<td>(0.1)</td>
<td>(0.1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Literacy</td>
<td>-</td>
<td>-</td>
<td>+0.65</td>
<td>+0.43</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.001)</td>
<td>(0.05)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Workforce</td>
<td></td>
<td></td>
<td></td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sch.Castes Population</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

Note:- 1. Figures in parentheses indicate the level of confidence  
2. NS = Not significant
in other socio-economic attributes. In Bhubaneswar, growth in sex ratio was positively, relatively strongly and significantly related only to the growth in Scheduled Castes population during 1961-71. During the next decade, however, even this correlation had become very weak and insignificant, while with all other attributes it had turned negative, though weak and insignificant. During 1981-91, growth in sex ratio was relatively strongly, positively and significantly related only to the growth in density (Table 20). It had negative, strong and significant correlations with all other socio-economic attributes, except for growth in literacy with which its correlation was weak, negative and not significant.

The growth in literacy in Bhubaneswar has been positively and significantly associated with the growth in workforce since 1961. This is expected in a city meant to function as the administrative headquarters of a state. However, the correlation had become relatively weak during 1981-91. This trend has been identified for Chandigarh also. Similarly, its correlation with sex ratio and Scheduled Castes population has been weak and not significant, generally negative with the former and positive with the latter.

The growth in workforce in Bhubaneswar during 1961-71 shows a weak and insignificant correlation with the growth in density, sex ratio and Scheduled Castes population. The correlation was strong only with growth in literacy (Table 18). The same trend can be identified for 1971-81 also, except that its correlation with density and sex ratio had become negative and remained insignificant (Table 19). During the next decade, the earlier trend had become further accentuated. The growth in workforce during this decade (1981-91) was negatively and significantly related to growth in density and sex ratio and positively and significantly related to growth in Scheduled Castes population (Table 20).

The growth in Scheduled Castes population in Bhubaneswar had a positive, strong and significant correlation only with growth in sex ratio during 1961-71; with other attributes, the correlations were weak and insignificant. This trend continued during 1971-81. the only important change being that the positive and strong correlation with growth in sex ratio also became weak and insignificant. However, during the next decade, definite associations between the growth in Scheduled Castes population and other socio-economic attributes emerged. The growth in Scheduled Castes population
was positively and significantly correlated with growth in population and workforce and negatively and significantly correlated with growth in density and sex ratio. Its correlation with literacy continued to be weak and insignificant.

**GROWTH OF SOCIO-ECONOMIC ATTRIBUTES: GANDHINAGAR (1971-91)**

Briefly, the following are the salient features of growth of population in Gandhinagar since 1971: (i) the population of Gandhinagar town registered an absolute increase of 97,691 persons (growth of 406.11 per cent) during 1971-91, and (ii) there has been a slowing down in the decadal growth rates of population, 160 and 94.97 per cent during 1971-81 and 1981-91 respectively (Table 21).

Between 1971 and 1991, the population density increased by 1721 persons per sq. km, from 424 to 2145 persons per sq. km. This was substantially lower than the corresponding increase for Chandigarh and Bhubaneswar (4518 and 2539 persons per sq. km. respectively between 1961 and 1991).


<table>
<thead>
<tr>
<th>Attributes</th>
<th>1971-91</th>
<th>1971-81</th>
<th>1981-91</th>
</tr>
</thead>
<tbody>
<tr>
<td>Growth of Population (per cent)</td>
<td>406.11</td>
<td>160</td>
<td>94.97</td>
</tr>
<tr>
<td>(persons)</td>
<td>(62433</td>
<td>(121746</td>
<td>(persons)</td>
</tr>
<tr>
<td>Density of Population</td>
<td>1721</td>
<td>676</td>
<td>1045</td>
</tr>
<tr>
<td>(persons per sq.km.)</td>
<td>(1100)</td>
<td>(857)</td>
<td>(2145)</td>
</tr>
<tr>
<td>Sex Ratio (females per 1000 males)</td>
<td>31</td>
<td>-1</td>
<td>32</td>
</tr>
<tr>
<td>(per cent)</td>
<td>(857)</td>
<td>(889)</td>
<td></td>
</tr>
<tr>
<td>Literacy (per cent)</td>
<td>569.85</td>
<td>213</td>
<td>114</td>
</tr>
<tr>
<td></td>
<td>(67)</td>
<td>(72)</td>
<td></td>
</tr>
<tr>
<td>Workforce (per cent)</td>
<td>344.13</td>
<td>130</td>
<td>93</td>
</tr>
<tr>
<td></td>
<td>(28)</td>
<td>(27)</td>
<td></td>
</tr>
<tr>
<td>Sch. Castes Population (per cent)</td>
<td>855.47</td>
<td>298</td>
<td>140</td>
</tr>
<tr>
<td></td>
<td>(12.64)</td>
<td>(15.35)</td>
<td></td>
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</table>

Note: Figures in parentheses refer to proportions / value at the end of the decade.

<table>
<thead>
<tr>
<th>Attributes</th>
<th>1971-81</th>
<th>1981-91</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density of Population (persons per sq.km.)</td>
<td>+0.85 (0.001)</td>
<td>+0.60 (0.01)</td>
</tr>
<tr>
<td>Sex Ratio (females per 1000 males)</td>
<td>+0.25 (N.S.)</td>
<td>-0.09 (N.S.)</td>
</tr>
<tr>
<td>Literacy (per cent)</td>
<td>+0.98 (0.001)</td>
<td>+0.68 (0.001)</td>
</tr>
<tr>
<td>Workforce (per cent)</td>
<td>+0.88 (0.001)</td>
<td>+0.86 (0.001)</td>
</tr>
<tr>
<td>Sch.Castes Population (per cent)</td>
<td>+0.54 (0.05)</td>
<td>+0.51 (0.2)</td>
</tr>
</tbody>
</table>

**Note:-**
1. Figures in parentheses indicate level of confidence
2. N.S.: Not significant


<table>
<thead>
<tr>
<th>Population Growth</th>
<th>Density</th>
<th>Sex Ratio</th>
<th>Literacy</th>
<th>Workforce</th>
<th>Sch.Castes Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population Growth</td>
<td>-</td>
<td>+0.85 (0.001)</td>
<td>+0.25 (N.S.)</td>
<td>+0.98 (0.001)</td>
<td>+0.88 (0.001)</td>
</tr>
<tr>
<td>Density</td>
<td>-</td>
<td>+0.04 (N.S.)</td>
<td>+0.86 (0.001)</td>
<td>+0.75 (0.001)</td>
<td>+0.33 (N.S.)</td>
</tr>
<tr>
<td>Sex Ratio</td>
<td>-</td>
<td></td>
<td>+0.21 (N.S.)</td>
<td>-0.06 (N.S.)</td>
<td>+0.16 (N.S.)</td>
</tr>
<tr>
<td>Literacy</td>
<td>-</td>
<td></td>
<td></td>
<td>+0.79 (0.001)</td>
<td>+0.46 (0.1)</td>
</tr>
<tr>
<td>Work force</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td>+0.46 (0.1)</td>
</tr>
<tr>
<td>Sch.Castes Population</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note:-**
1. Figures in parentheses indicate the level of confidence
2. NS = Not significant
### TABLE 24: GANDHINAGAR CITY: MULTI-COLLINEARITY OF SOCIO-ECONOMIC ATTRIBUTES OF POPULATION (1981-91)

<table>
<thead>
<tr>
<th></th>
<th>Population Growth</th>
<th>Density</th>
<th>Sex Ratio</th>
<th>Literacy</th>
<th>Workforce</th>
<th>Sch.Castes Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population Growth</td>
<td>-</td>
<td>-0.60</td>
<td>-0.09</td>
<td>+0.68</td>
<td>+0.86</td>
<td>+0.51</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.01.)</td>
<td>(N.S.)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.02)</td>
</tr>
<tr>
<td>Density</td>
<td>-</td>
<td>+0.01</td>
<td>+0.57</td>
<td>+0.57</td>
<td>+0.57</td>
<td>+0.33</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(N.S.)</td>
<td>(0.01)</td>
<td>(0.01)</td>
<td>(N.S.)</td>
<td>(N.S.)</td>
</tr>
<tr>
<td>Sex Ratio</td>
<td>-</td>
<td>-0.22</td>
<td>+0.11</td>
<td>-</td>
<td>+0.57</td>
<td>+0.15</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(N.S.)</td>
<td>(0.01)</td>
<td>(N.S.)</td>
<td>(N.S.)</td>
<td>(N.S.)</td>
</tr>
<tr>
<td>Literacy</td>
<td>-</td>
<td>-0.22</td>
<td>+0.11</td>
<td>-</td>
<td>+0.57</td>
<td>+0.54</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(N.S.)</td>
<td>(0.01)</td>
<td>(N.S.)</td>
<td>(N.S.)</td>
<td>(0.01)</td>
</tr>
<tr>
<td>Workforce</td>
<td>-</td>
<td>-0.22</td>
<td>+0.11</td>
<td>-</td>
<td>+0.57</td>
<td>+0.32</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(N.S.)</td>
<td>(0.01)</td>
<td>(N.S.)</td>
<td>(N.S.)</td>
<td>(N.S.)</td>
</tr>
<tr>
<td>Sch.Castes Population</td>
<td>-</td>
<td>-0.22</td>
<td>+0.11</td>
<td>-</td>
<td>+0.57</td>
<td>+0.32</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(N.S.)</td>
<td>(0.01)</td>
<td>(N.S.)</td>
<td>(N.S.)</td>
<td>(N.S.)</td>
</tr>
</tbody>
</table>

Note: 1. Figures in parentheses indicate the level of confidence
2. NS = Not significant

Unlike in Chandigarh and Bhubaneswar, the area of Gandhinagar has not increased between 1971 and 1991.

The sex ratio in Gandhinagar was fairly high (858 females per 1000 males in 1971) to begin with in comparison to 625 and 693 females per 1000 males in Chandigarh and Bhubaneswar respectively in 1961. In 1991, Gandhinagar recorded a sex ratio of 889 females per 1000 males, while in Chandigarh and Bhubaneswar, it continued to be fairly low, 817 and 752 females per 1000 males respectively.

The literate population in Gandhinagar registered a growth of 569.85 per cent between 1971 and 1991. As in the case of Chandigarh and Bhubaneswar, this rate of growth was higher than that of the growth of total population during the same period. In 1971, the literates constituted 55 per cent of Gandhinagar’s population; this proportion increased to 72 per cent in 1991, the highest among the three cities. As compared to the growth in literacy and total population, the growth in workforce was low, an absolute increase of 26,147 workers or 344.13 per cent growth during 1971-91. In 1971, the workforce constituted 32 per cent of the total population. This proportion decreased over successive decades and was 27 per cent in 1991. In comparison, in both Chandigarh and
Bhubaneswar, the proportion of workers has remained around one-third of the population since 1971.

The Scheduled Castes population in Gandhinagar increased by 16,963 persons or by 855.47 per cent during 1971-81. This rate of increase was higher than those for all other socio-economic attributes. This is similar to Chandigarh but not Bhubaneswar. In 1971, 1983 persons (8.25 per cent of the total population) were registered as Scheduled Castes. In 1991, their number had increased to 18946 persons, forming 15.35 per cent of the total population.

The trend of successively lower rates of population growth in Gandhinagar has been noted. A similar trend can be identified for the socio-economic attributes of population, except density and sex ratio (Table 21). Population density registered a higher growth during 1981-91 (1045 persons per sq. km.) as compared to the previous decade (676 persons per sq. km.). Since the total area in Gandhinagar has remained constant since 1971, the growth in density of population reflects the development of the city. Similarly, the growth in sex ratio, which was higher during 1981-91 (an increase of 32 females per 1000 males) as compared to 1971-81 (a decline by 1 female per 1000 males), is associated with developments in housing resulting in family-type migration to the city. Gandhinagar recorded a sex ratio of 858, 857 and 889 females per 1000 males in 1971, 1981 and 1991 respectively.

The association between the spatial patterns of growth of population and various socio-economic attributes in Gandhinagar during the two decades can be identified from Table 22. The correlation of population growth with density, literacy and workforce was positive, very strong and significant during 1971-81, it was weak and insignificant with growth in sex ratio. During the next decade, the correlation with sex ratio became weaker, and negative but not significant. The rank correlation values and levels of confidence between various socio-economic attributes during 1971-81 and 1981-91 are given in Tables 23 and 24 respectively. Broadly, the multi-collinearity in the growth of socio-economic attributes during 1971-81 and 1981-91 follows the relationships identified in Chandigarh and Bhubaneswar.

The correlation between the spatial patterns of growth in density and those of growth in literacy and workforce were positive, strong and significant, weak and
insignificant for growth in Scheduled Castes population, and weaker for growth in sex ratio during 1971-81 (Table 23). This pattern was repeated during the next decade also, except for a weakening of the correlations with literacy and workforce. The correlation with growth in sex ratio during 1981-91 was negative and not significant (Table 24). The spatial patterns of growth in sex ratio had weak and insignificant correlations with other socio-economic attributes during 1971-81. These weakened further during the next decade and remained not significant. This is somewhat surprising in view of the comparatively high sex ratio in Gandhinagar.

The growth in literacy in Gandhinagar during 1971-81 was positively, strongly and significantly correlated to the growth in density and workforce, relatively weak but significant to the growth in Scheduled Castes population, and poorly correlated to sex ratio. Following the general pattern, the correlation became weaker during the next decade. The same pattern can also be identified for growth in workforce.

The correlation between the growth in Scheduled Castes population and other socio-economic attributes in Gandhinagar follows the general pattern identified in Chandigarh and Bhubaneswar. However, its relatively strong correlation with growth in literacy is similar to that of Chandigarh’s alone.

**SUMMARY**

A study of the trends and spatial patterns of growth of the socio-economic attributes of the population of a city is a pre-requisite to an understanding of the growth of its demographic character. In this regard, two vital factors place Chandigarh on a different level: first, it is a completely planned city, and second, since its inception, it has evolved from a monofunctional administrative centre to a multifunctional city. Due to its planned nature, the plan provisions, particularly those related to housing and urban infrastructure, have acted as major determinants of the growth in various socio-economic characteristics of the population. The evolution of the city from a monofunctional to a multifunctional regional centre, and the consequent dynamics of growth in the socio-economic attributes of its population, have major implications for the viability and flexibility of the plan proposals.
A major characteristic of the growth of socio-economic attributes in Chandigarh is the positive spatial association between the intra-city patterns of population growth and those of the socio-economic attributes. Further, the patterns of growth in the socio-economic attributes also exhibit a significant degree of multi-collinearity among themselves at a high level of confidence. The correlation between population growth and that of growth in literacy and workforce is consistently positive, very high and very significant, and reflects the city’s functional character. In comparison, the correlation between growth of population and that of density of population, sex ratio and Scheduled Castes population becomes increasingly stronger and significant over successive decades. This indicates the changes in the demographic character of the city that have accompanied its growth. An aberration to these general trends is provided by the decade 1971-81. During this decade, the Phase II Sectors in the city started developing and were appended to the fairly well-developed Phase I Sectors. The growth in sex ratio and Scheduled Castes population in the city revealed a weak and even negative correlation with the growth of socio-economic attributes. This weak correlation may be due to the specific association with conducive residential infrastructure in case of growth in sex ratio, and with the availability of employment in case of the Scheduled Castes population. The availability of a conducive family-type residential environment and adequate employment may appear only as the city develops. This is supported by the fact that during the next decade, 1981-91, the growth in all the socio-economic attributes in the city once again had a uniform, positive and significant multi-collinearity. Chandigarh, in this sense, can be said to have reached maturity as a city.

Chandigarh has consistently recorded a fairly high population density. It increased from 2819 persons per sq. km. in 1961 to 7333 persons per sq. km. in 1991, a growth of 4514 persons per sq. km. during 1961-71. This growth has been in spite of an increase in the area of the city from 31.68 sq. km. in 1961 to 69.63 sq. km. in 1991, and is therefore, related to the settlement of new Sectors as well as the infilling of earlier developed Sectors. The plan proposals for different Sectors in Chandigarh were based on three broad population density levels, 25, 50 and 75 persons per acre (6177, 12355 and 18532 persons per sq. km.) for low, middle and high density areas respectively, depending upon the functional character of the Sector and the socio-economic status of the resident
Regulations regarding 'Frame Control' of individual buildings were provided to control the intensity of construction and the consequent density of population. In 1961, the pattern of distribution of density of population in the Phase I Sectors was related to the stage of development of a Sector and the nature of housing provided in it. Thus, the highest densities (more than 2925 persons per sq. km.) were registered by Sectors which were the first to develop in the city and had small sized government and private plots. Most of these Sectors were planned as high or medium density areas.

The high growth in density during 1961-71 (1868 persons per sq. km.) may be attributed to the recency of development of the city, characterizing a small base of population in 1961, and the Reorganization of Punjab in 1966, which made Chandigarh a triple administrative headquarters and resulted in a substantial increase in the number of government employees to be stationed in Chandigarh. Within the city, Sectors with small sized government and private plots and proposed as high or medium density areas recorded the highest rates of growth in density (more than 5478 persons per sq. km.). In comparison, Sectors with institutional housing, and those with large sized plots and proposed as low density areas registered comparatively lower levels of change in population density (less than 2749 persons per sq. km.). In the next decade, three major trends could be identified in the growth of density of population in the city. First, the areas of high as well as low growth in density generally corresponded to areas of similar levels of growth in population (r = 0.56). Secondly, the highest change in density was registered by the newly developed and enumerated Phase II Sectors (numbers 31 to 38 and 47), by those Phase I Sectors which had a high intensity of development due to a predominance of small sized plots (Sectors 20,21,22,23 and 27), and by those Sectors which developed additional housing, particularly for the EWS (Sectors 29 and 30). Thirdly, a majority of Phase I Sectors recorded lower rates of growth in density during this decade as compared to the previous decade. This deceleration conforms to the general trend noted for growth of population as well. At the same time, the population densities of seventeen Phase I Sectors exceeded their planned levels in 1981. This suggests a possible saturation of the housing facilities in these Sectors and the onset of a
stage in which expansion in housing becomes secondary and infilling becomes the primary process.

During the following decade, 1981-91, the highest rates of growth in density were recorded in the Phase II Sectors enumerated for the first time in 1981 (numbers 39 to 46). The high rates of growth in these were associated with their recent development, location of Outgrowths and Census Towns within these Sectors, and the development of multi-storied blocks of flats. In comparison, the Phase II Sectors that had started developing during the previous decade (numbers 31 to 38 and 47) as well as a few older Phase I Sectors recorded a sluggish growth in density, conforming to the trend of a decelerating growth following an initial rapid increase. In addition, as many as twenty Phase I Sectors registered a decline in population density during this decade. These included, prominently, Sectors with a high intensity of housing, and those from which unauthorized settlements had been removed. The decline in population density as well as in population in all these twenty Sectors is suggestive of a shifting out and dispersal of population from the Phase I Sectors. This was probably due to conditions of residential overcrowding, following the saturation of existing housing facilities, as well as the migration of the younger generation in search of employment or after getting employment. However, inspite of such diverse patterns of growth in density of population among its Sectors, the city as a whole emerged as one of the most densely populated urban areas in the country, with a population density of 7333 persons per sq. km. in 1991. Further, fifteen of the forty-six Sectors in the city exceeded their planned density levels in 1991. The patterns of distribution of density in 1991 reveal an area of high density on the eastern and western limits of the city and a central area comprising the southern Sectors of Phase I of the development of the city. The Sectors forming areas of high density were proposed as high or medium density areas in the city plan. The areas of low density in the city included the northern high income low density Sectors, institutional Sectors with restricted housing and those Phase II Sectors which were either proposed as low density areas or were yet to develop fully.

The generally low to moderate sex ratio values recorded by the city during different decades reflect its basic functional character as an administrative town. However, the steady improvement in sex ratio that has taken place, from 625 females per
1000 males in 1961 to 817 females per 1000 males in 1991, reflects a residential environment conducive for family-type living, and employment and educational opportunities for women provided by the city. In the initial years of the city's development, the low sex ratio was related mainly to specific employment opportunities that attracted single male workers. However, even at that time the sex ratio was high in the earliest developed Sectors due to the availability of family accommodation (Sectors 7,19,22 and 27). Interestingly, while most of the Sectors recording a high growth in population during 1961-71 were located in the then southern parts of the city, the Sectors recording a high growth in sex ratio during the same period were located in the northern parts of the city. This was associated with expansion in housing facilities and the presence of educational institutions with hostel facilities for women. During 1971-81, the city recorded a low rate of growth in sex ratio, 28 females per 1000 males, and ten out of the thirty-eight Sectors in the city recorded a decline in sex ratio. Further, during this decade, the growth in sex ratio recorded an insignificant relationship with all other socio-economic attributes. While it was positive but weak with population growth and literacy ($r = 0.04$ and $0.13$ respectively), it was negative with population density, workforce and Scheduled Castes population ($r = -0.09$, $-0.20$ and $-0.16$ respectively). This was related to the development of nine new Phase II Sectors (numbers 31 to 38 and 47). However, once housing in these Sectors developed, the sex ratio improved. It registered a higher growth during 1981-91 (37 females per 1000 males) as compared to 1971-81, and its relationship with other attributes emerged as strong and positive. During 1981-91, the highest growth in sex ratio was recorded in the Phase II Sectors, particularly those which had been enumerated for the first time in 1981 (numbers 39 and 46). This high growth was associated with the expansion in housing, private, public and those developed by the Chandigarh Housing Board. In comparison, most of the Phase I Sectors recorded a sluggish growth in sex ratio, a familiar trend in the growth patterns of Sectors in Chandigarh. The exception to this general trend included Sectors with hostel facilities for women (Sectors 11, 26) and those with a greater decline in the male population as compared to the female population (for example, Sectors 4 and 17). Interestingly, of the twenty Phase I Sectors which recorded a decline in population during this decade, only two Sectors (numbers 8 and 18), recorded a corresponding decline in sex ratio. The 1991
distribution pattern of sex ratio indicates a distinct southward shift in the areas of high sex ratio as compared to the 1961 pattern. The southern Phase II Sectors, which had registered the highest rates of growth in sex ratio during 1981-91, emerged as areas of high sex ratio in 1991. This was associated with the development of HIG, MIG, LIG and EWS flats as well as institutional housing. In addition, Sectors with hostel facilities for women, for example Sectors 11 and 36, recorded the highest sex ratios in the city in 1991 (1081 and 1051 females per 1000 males respectively).

The city has consistently recorded a high proportion of literates (60.53, 66.3, 68 and 70 per cent in 1961, 1971, 1981 and 1991 respectively) since its inception. This is in keeping with its planned functional character, as well as the recent expansion in functions and its growth into a regional educational centre. The growth in literacy during various decades (168, 79 and 39 per cent during 1961-71, 1971-81 and 1981-91 respectively) has been higher than the growth in population (144.89, 73.56 and 34.47 per cent respectively) for the same period. The patterns of growth in literacy in the city broadly corresponded to those of population growth during various decades. While the correlation of growth in literacy with growth of population, population density and workforce in the city has been consistently positive and strong, it was comparatively weak with sex ratio and Scheduled Castes population during 1961-71 (r = 0.33 and 0.42 respectively), insignificant during 1971-81 (r = 0.13 and 0.21 respectively), but positive and strong during 1981-91 (r = 0.55 and 0.45 respectively).

In 1961, eighteen of the twenty-nine Sectors in the city recorded a proportion of literates higher than the city average of 60.53 per cent. The pattern of distribution of literates in 1961 reveals a positive association with the presence of public housing. In comparison, literacy levels were negatively associated with such functional areas as the Capitol Complex and the wholesale market, and other Sectors which were at an early stage of development. During 1961-71, the highest rates of growth in literacy were recorded in Sectors which had a low base of literate population in 1961. High rates of growth in literacy were also recorded by Sectors enjoying vicinal location to such work areas as the City Centre and the Educational Zone (for example, Sectors 10, 11, 15, 18). On the other hand, comparatively lower rates of growth were registered in the earlier developed Sectors (for example, Sectors 20, 22, 23) due to the limited extent of public
housing available in these, a high rate of occupancy and a low rate of population growth. During the following decade, 1971-81, the highest rates of growth in literacy were registered in the new Phase II Sectors, which were also the areas of developments in housing, institutions and work areas. In comparison, most of the older Phase I Sectors recorded a sluggish increase in literacy levels, and during the following decade, a majority of these Sectors were to record negative rates of growth. However, despite the sluggish growth, the proportion of literates in most of the Phase I Sectors was high. This suggests that the low growth in literacy was mainly associated with the stage of development of a Sector. During 1981-91, the development of new work areas within the Phase II Sectors as well as on their peripheries resulted in most of the seventeen Phase II Sectors registering a high growth in literacy. The highest change in literacy was recorded in the eight new Phase II Sectors enumerated for the first time in 1981 (numbers 39 to 46). In comparison, seventeen Phase I Sectors recorded a decline in literacy during this decade, while in the remaining twelve Phase I Sectors, the rate of growth was sluggish. All the above mentioned seventeen Phase I Sectors recorded a decline in population as well, and depending upon the literacy status of the population shifting out of these Sectors, the proportion of literates either increased or decreased. Specifically, institutional Sectors with restricted housing recorded a decline in the proportion of literates, while in the predominantly residential Sectors, the proportion of literates increased. In 1991, thirty-seven out of the forty-seven Sectors in the city had a literacy level higher than the city average of 70 per cent. The high levels of literacy in Chandigarh can be gauged from the fact that Sectors grouped as areas with a low proportion of literates in 1991, had more than 70 per cent of their population registered as literate. In general, the presence of slums, EWS housing and labour colonies tended to lower the proportion of literates in a Sector. Interestingly, although some Sectors registered negative rates of growth in literacy, none of the Sectors in the city registered a decline in the proportion of literates between 1961 and 1991.

The proportion of workers in Chandigarh declined from 39 per cent in 1961 to 34 per cent in 1991. This decline was associated with the conducive residential environment that the city provides for family-type living as well as its development into a regional educational centre, resulting in the presence of a large student population. This decline in
workforce in the city has been in spite of the evolution of the city's functional nature, from a monofunctional administrative town to a multifunctional city with tertiary and quaternary functions. The past two decades have also witnessed the development of major work areas in the region adjoining the city. While the proportion of workers in Chandigarh has remained around one-third of the city's population since 1971, the proportion of female workers has consistently increased, from 6.78 per cent in 1961 to 15.23 per cent in 1991. This is indicative of the positive environment that the city provides for female participation. During 1961-71, the high rate of growth in workforce (108 per cent) was associated with the early stage of the settlement of the city, the availability of jobs in construction activities and the Reorganization of Punjab state in 1966. Among the various Sectors in the city, the patterns of growth in workforce generally reflected the patterns of growth in total population. Secondly, the highest growth in workforce was registered by Sectors which were at an early stage of development. Their low sex ratios suggest the dominating presence of single male workers. In comparison, earlier developed Sectors recorded lower rates of growth associated with the well developed housing infrastructure, for family-type living. During 1971-81, the workforce in the city registered a growth of 80 per cent, and the proportion of workers increased from 33.3 per cent in 1971 to 35 per cent in 1981. Within the city, two groups of Sectors registered a high growth in workforce – the newly enumerated Phase II Sectors (numbers 31 to 38 and 47) and institutional Phase I Sectors (numbers 1, 6, 17, 26, 30 and the Industrial Area). The associations were the early stage of development in case of the former and an expansion in functions in case of the latter. In comparison, most of the older Phase I Sectors recorded a low and sluggish growth in workforce during this decade as compared to the previous decade. This conformed to the familiar trend of decelerating rates of growth following an initial rapid increase. The low growth in workforce was related to an expansion in housing and an increase in the number of dependents.

The continued expansion and proliferation of employment avenues, particularly in the Phase II Sectors, promoted a 34 per cent increase in the number of workers during 1981-91. This was, however, at a much lower rate as compared to the previous decades and was associated with expansion and developments in housing. The highest rates of
growth were registered in the eight new Phase II Sectors (numbers 39 to 46). In comparison, the earlier developed nine Phase II Sectors and all the older Phase I Sectors recorded a sluggish growth rate. In fact, twenty-three of the twenty-nine Phase I Sectors recorded a decline in workforce during this decade. The decline was substantial in two groups of Sectors, (a) in institutional Sectors, due to the moving in or out of entire families or the removal of slums (for example, Sectors 6,12,14,17 and 26), and (b) in Sectors characterized by residential overcrowding and a saturation of housing facilities (for example, Sectors 7,15,18,20,22,23 and 27). Interestingly, inspite of the negative growth in workforce, five of these twenty-three Sectors recorded an increase in the proportion of workers between 1981 and 1991. This could be associated with the shifting out of entire families rather than workers alone. Further, nineteen of these twenty-three Sectors also recorded a decline in their population during this decade. This reiterates the trend of a dispersal of population from the older Phase I Sectors. The pattern of distribution of workforce in Chandigarh in 1991 reveals a concentration of workers in the central parts of the city, a pattern similar to the one identified for evolved towns. In Chandigarh, the central parts comprise both earlier developed work areas, for example, Sectors 17 and 22, as well as new work areas, for example, Sector 34, which contains the first city sub-centre. In addition, a high proportion of workers was also registered in other work areas, for example, the Capitol Complex and the wholesale market as well as in Sectors located in proximity to major work zones, for example, Sectors 15, 16,18 and 27. In comparison, a low proportion of workers was recorded in the Sectors located on the eastern margins of the city and having institutional housing (Sectors 28,29,31 and 47), and Sectors located on the western margins of the city, comprising the educational zone (Sectors 10,11,12 and 14).

The traditional association of Scheduled Castes population with unskilled and informal activities suggests that with the growth of the city, there would be an increase in the proportion of this segment of population as well. This generalization holds true for Chandigarh. The proportion of Scheduled Castes population in Chandigarh has increased from 8.5 per cent in 1961 to 15.88 per cent in 1991. Further, the decadal rates of growth in Scheduled Castes population (182.83, 123.29 and 69.06 per cent during 1961-71, 1971-81 and 1981-91 respectively) have been considerably higher than the growth rates
for total population (144.89, 73.56 and 34.47 per cent respectively). In 1961, the Scheduled Castes formed 8.5 per cent of the city’s population. The availability of employment in construction activities was the main factor contributing to their presence in Chandigarh. The Sectors with a high proportion of Scheduled Castes population in 1961 were located on the northern, eastern and western peripheries of the city. This pattern was associated with proximity to main work areas and the presence of unauthorized settlements. Thus, despite the early stage of development of the city, the distribution pattern of Scheduled Castes population was similar to the one observed in evolved towns. During 1961-71, the high rate of growth in Scheduled Castes population (182.83 per cent) was associated with the early stage of development of the city and the consequent large-scale construction activities. The highest growth in Scheduled Castes population was registered in Sectors located on the peripheries of the city. In comparison, the areas of low growth comprised Sectors which were planned for high and middle income groups, and were among the earliest to be developed in the city. Interestingly, five institutional Sectors recorded a decline in Scheduled Castes population during this decade. During 1971-81, the growth in Scheduled Castes population was at the rate of 123.29 per cent. Compared to the growth rate of 182.83 per cent during the previous decade, it conformed to the trend of a decelerating growth rate following an initial rapid increase. However, the proportion of Scheduled Castes population in the city increased from 9.82 per cent in 1971 to 12.63 per cent in 1981. During this decade, the highest growth in Scheduled Castes population was recorded in Sectors offering avenues of employment in construction, institutional and informal activities, and in Sectors with transit sites or EWS/LIG housing. Unlike other socio-economic attributes, the areas of high growth in Scheduled Castes population were not solely confined to the newly developed Phase II Sectors. In fact, two Phase II Sectors recorded a decline in Scheduled Castes population, associated with the removal of unauthorized settlements.

During 1981-91, the highest rates of growth in Scheduled Castes population continued to be registered in the peripheral areas of the city, in Sectors located in proximity to typical employment avenues, and in Sectors with LIG/EWS housing. In comparison, most of the earlier developed Phase I Sectors, having a relatively inner location, recorded a low growth, associated with the limited scope for expansion either in
housing or employment avenues. Sixteen Sectors, including two Phase II Sectors, recorded a decline in Scheduled Castes population during this decade. This decline can be attributed to the relocation of slums and squatter settlements and changes in institutional employment. Some of these Sectors also registered a decline in their total population. The pattern of distribution of Scheduled Castes population in 1991 continues to conform to the trend of an increase in their proportion with increasing distance from the City Centre. The areas of high concentration of Scheduled Castes population in Chandigarh in 1991, thus, continue to be located on the peripheries of the city, and include institutional or public function areas, Sectors having unauthorized settlements or housing for the poor, and those located in proximity to major work areas. The largest area of low proportion of Scheduled Castes population extends from north to south, almost in the centre of the city. It comprises of well developed Sectors with a relatively inner location, which are mainly residential, offering limited employment in commercial or informal activities.

The patterns of growth in various socio-economic attributes of population in Chandigarh can be associated with the following factors: the stage of development or age of a Sector, its functional character, the type of housing particularly in terms of the size of plots, the socio-economic status of the resident population group, proximity to major institutional areas, general location within the city and the presence of slums and unauthorized settlements. All of these factors are a product of the plan framework, whether through the plan proposals, or as a result of a lacunae in the provisions. Further, depending upon these factors, a direct or inverse relationship could be identified between the value of an attribute at the beginning of a decade and its growth rate during the decade. Thus, the earlier developed Phase I Sectors generally move from a direct relationship of high value in 1961 and a high growth during 1961-71 to an inverse relationship of a high value in 1981 but low or even negative rate of growth in various socio-economic attributes during 1981-91. In comparison, the newly developed Phase II Sectors and Sectors with a small base of population in the initial decade have an inverse relationship of low value at the start of the decade but high growth rate during the decade. The low density high income northern Sectors as well as institutional Sectors with restricted housing generally follow a pattern of direct relationship of low value at the start.
of the decade and low growth for all attributes, except workforce and Scheduled Castes population, during the decade. In case of these two attributes, the relationship in institutional Sectors is of a high value at the beginning of the decade but low or negative growth during the decade. In addition, specific variations come into play in case of individual attributes. For example, the following attributes positively influence the nature of relationship, the location of women’s hostels and avenues for female employment in case of sex ratio, proximity to institutional areas where literacy is a basic requirement in case of literacy, and increasing distance from the central parts of the city in case of Scheduled Castes population.

Many of the factors mentioned above also operate in evolved towns, for example, the age of mohallas, their general location in the city, and proximity to work areas etc. However, while in the traditional evolved towns these factors are a function of ecological processes, in Chandigarh they have resulted from detailed plan proposals. To illustrate the basic difference in the processes operating in the two types of towns, one can cite the decline registered in many of the socio-economic attributes in the older Sectors in Chandigarh. This is comparable to the phenomenon of decline identified in the core of evolved towns and cities. However, in these cities the decline is associated with a deterioration in the structural and environmental living conditions, whereas in Chandigarh, the decline is due to the limited potential for expansion of housing facilities within the plan framework.

The trends identified in the growth of socio-economic attributes in Chandigarh broadly hold true for Bhubaneswar and Gandhinagar as well. However, some specific variations can be observed. In Bhubaneswar, for example, the exceptions were growth in density and Scheduled Castes population. Secondly, a strong correlation can be identified between the growth of population and growth in literacy and workforce. This is similar to the one identified in Chandigarh as well, and is associated with the similarity in functional nature of the two cities. Thirdly, the correlation between growth in population and growth in density and sex ratio in Bhubaneswar becomes progressively weak over successive decades. This is in striking contrast to the trend identified in Chandigarh, where the correlation between population growth and all other socio-economic attributes was positive and strong during 1981-91. The aberrations in the
growth of density in Bhubaneswar may be associated with the emphasis on horizontal planning and even gaps in the planning process. The sluggish growth in sex ratio and its rather low level may be associated with the generally low levels of sex ratio in Orissa. Fourthly, like Chandigarh, Bhubaneswar has always recorded high levels of literacy. The proportion of workers in the city, approximately one-third of the total population since 1971, is also similar to Chandigarh. In comparison, the proportion of Scheduled Castes population in Bhubaneswar in 1991 (8 per cent) was much lower than the proportion in Chandigarh (15.88 per cent).

In Gandhinagar, the rates of growth of population and its socio-economic attributes during the two decades of the city’s existence reveal a deceleration. This attribute is similar to the one identified in the other two cities. The exceptions in Gandhinagar were the growth in population density, like Bhubaneswar, and in case of growth in sex ratio, like Chandigarh. The growth in density in Gandhinagar was higher during 1981-91, that is the second decade of its development, as compared to 1971-81. Unlike Chandigarh and Bhubaneswar, the total area of Gandhinagar city has remained constant. Therefore, the higher growth in density of population during the later decade reflects a more rapid pace of development. The growth in sex ratio in Gandhinagar also follows a trend of higher growth during 1981-91 as compared to 1971-81. This may be associated with developments in housing, resulting in family-type migrations to the city. These factors have also been identified for the growth in sex ratio in Chandigarh. In addition, the multi-collinearity between growth in sex ratio and other socio-economic attributes in Gandhinagar exhibits a continuously weakening relationship since 1971. This trend is specific to Gandhinagar alone, and is surprising in view of the fairly high sex ratios registered in the city. Like both Chandigarh and Bhubaneswar, the correlation between growth of population and growth in literacy and workforce in Gandhinagar has been positive and highly significant. In comparison, the correlation between population growth and growth in density in Gandhinagar has weakened during the two decades since its establishment. While this is similar to Bhubaneswar, in Chandigarh, the correlation between population growth and growth in density has become stronger over time. Like both Chandigarh and Bhubaneswar, Gandhinagar has consistently recorded high literacy levels, and in 1991, registered the highest proportion of literates among the
three cities. However, unlike Chandigarh and Bhubaneswar, where the proportion of workers has stabilized to around one-third of the population, the proportion of workers in Gandhinagar has continuously declined. The proportion of Scheduled Castes population in Gandhinagar is comparable to that in Chandigarh (15 per cent in 1991), whereas Bhubaneswar has a much lower proportion of this segment of population.

In totality, the trends in the growth of socio-economic attributes of population in the three modern planned state capitals, Chandigarh, Bhubaneswar and Gandhinagar, are broadly similar, particularly in the case of attributes basic to the performance of the administrative function, namely literacy and workforce. In comparison, such attributes as density of population, sex ratio and Scheduled Castes population have followed trends which are city specific. Among the three cities, the growth of socio-economic attributes in Chandigarh has followed a more consistent trend since the inception of the city. This can be attributed to the detailed and meticulous planning of the city and its execution.

References and Notes

1. See Chapter 2 for details on the plan provisions
3. Although population density is a physical rather than socio-economic attribute, it has been included because of its significance as a primary determinant of the overall socio-economic character of a Sector and, therefore, of the city.