Urbanization has been recognised as a relatively recent, but by far, the most dominant process of social transformation of our times (1). It is best manifested in the growth of urban centres, both in terms of the number of towns as well as in the growth of urban population.

The ability of an urban place to sustain its growth over a period of time depends to a great extent upon its capacity to perform its functions efficiently, effectively and successfully, and to accommodate the continuously proliferating demands on its functional system. One of the composite indicators of the success of a city is the rank that it acquires vis a vis other towns in its region or state soon after its establishment, and the subsequent changes in its rank. The rank occupied by a city is the composite product of its function, economic base and the resultant cumulative growth. A commonly recognised and widely used method for understanding the relative position of individual urban places in a region is the ‘rank size rule’, an empirical expression of the city-size relationships (2).

The existence of a rank size regularity was first noted by Auerbach in 1913 (3). The credit for formally designing and popularising the concept goes to Zipf (4). Specifically, the Rank Size Rule refers to a statistical regularity which can be observed when the cities in an area are ranked from the largest to the smallest according to their populations (5). If plotted on a logarithmic scale, the relationship between the rank and size of cities emerges as a linear one (6). The study of the rank size hierarchy is of considerable importance in understanding the settlement structure within a system, since it provides useful information on the distortions in the hierarchy as well as the position of individual settlements in such a system (7). Deviations from the expected log normal relationship suggest a faster or sluggish growth. For example, the existence of city primacy indicates the disproportionate growth and the dominating influence of the largest city as compared to other towns within the system (8). In comparison, a polynucleated distribution is suggestive of a settlement system focused on a number of large cities (9).
All towns, irrespective of their rank, size and *raison d’ etre* cater to an external population constituting the city region or more popularly, ‘the umland’ (10). The concentration of a multitude of functions and services, catering to the needs of the city region, is intrinsic to the nature of urban centres. In turn, for its growth and development, a city taps the resources of its surrounding region (11). Thus, a city and its region are mutually interdependent, both economically and socially. Modern communications have enabled cities to greatly extend their range of services, and have given the surrounding populace more direct and immediate access to urban life and institutions (12). The symbiotic relationship between a city and its surrounding region has been the focus of a number of studies (13).

One major difference between the evolved and planned towns is that, while the former are both in and of the country, the latter are first laid in the country and subsequently become of the country (14). In other words, the planned towns (particularly the special function towns such as the planned state capitals), are not set up by the surrounding countryside to function as service centres. They build up their umlands only after their emergence. Starting from a nascent, even negative, association, the planned city develops close ties with its surrounding region, eventually resulting in pronounced changes in patterns of residence, economy and social activity in the latter. At the micro-level, the growth of individual cities is of considerable importance. It is the resident population and its growth that ensures the viability of cities, both in the urban hierarchy and in relation to the surrounding region (15).

This chapter focuses on the growth of Chandigarh with reference to the towns of Punjab and Haryana, the states of which it is the administrative capital, in terms of the changes in its rank in the regional urban system, development of its regional relations and impact on the surrounding region, and the growth of its population since 1961. An attempt has also been made to compare the attributes of growth of population of Chandigarh with those of Bhubaneswar and Gandhinagar. The growth of Chandigarh has been analysed at three levels, namely:

(i) in the context of the regional systems to which it belongs (rank size arrangement)
(ii) in relation to the immediately surrounding area (regional growth), and
(iii) as an individual city (intra-city growth pattern).
It is suggested that a study of the growth of Chandigarh at the above mentioned levels would provide a comprehensive understanding of the city's success vis à vis other already established towns, its functional interaction with the surrounding countryside, and as an individual town planning venture.

Methodology and Sources of Data

As has been mentioned previously, the growth of Chandigarh, Bhubaneswar and Gandhinagar, as also of other planned towns, can be analysed at three scales. The first scale considers these cities in the context of the urban system to which they belong in terms of the Rank Size arrangement. Therefore, for Chandigarh the pre-Reorganised Punjab in 1961 and Punjab and Haryana separately in 1971, 1981 and 1991 have been considered, since Chandigarh is the administrative centre of both these states. Bhubaneswar and Gandhinagar have been studied in the context of Orissa and Gujarat respectively for 1961, 1971, 1981 and 1991 (16). The data for the towns of these states have been obtained from the General Population Tables and the relevant Town Directories published by the Census of India (17).

The second scale of study in this chapter pertains to the planned state capitals in the context of their immediately surrounding region. In case of Chandigarh, the results of some early studies on the umland of Chandigarh have been referred to in order to ascertain how the city has built up its city region over the years. In case of Bhubaneswar, the focus is on the studies that have evaluated the city’s effect on the surrounding region and the proposals to identify a Capital Sub-Region. Gandhinagar is yet to build up a distinct city region for itself, and is still in the process of consolidating its own growth.

The third scale pertains to the description of the intra-city decadal patterns of growth of population in Chandigarh and the factors associated with this growth.

GROWTH IN THE REGIONAL SYSTEM

CHANDIGARH

In 1961, the state of Punjab, comprising the present states of Punjab, Haryana, parts of Himachal Pradesh and the Union Territory of Chandigarh, had 189 urban centres. Amritsar, the largest city, had a population of 376,295 persons and was 1.54 times larger
PUNJAB: Rank Size Distribution (1961)

Fig. 7
PUNJAB: Rank Size Distribution (1971)

Fig. 8
HARYANA: Rank Size Distribution (1971)

Fig. 9
than the second ranked city, Ludhiana (244,032 persons). Chandigarh, the new capital city, occupied sixth rank with a population of 89,321 persons. It was, however, the largest of the twelve Class II towns in the state (Fig.7). The actual population of all the towns in the state was higher than the expected values. The exceptions to this distribution were four Class VI towns, each with a population of less than 2,300 persons. As compared to the expected population, the actual population was considerably higher in towns with populations ranging between 10,000 to 50,000 persons. The urban population of Punjab in 1961 was 4,088,581 persons, forming 20.13 per cent of the state’s total population. The 17 largest towns, constituted by five Class I cities and twelve Class II towns, accounted for 45.14 per cent of the state’s urban population. In comparison, the 75 medium towns (Class III and IV) and 97 small towns (Class V and VI) accounted for 41.34 per cent and 13.52 per cent of Punjab’s urban population respectively.

After the Reorganization of Punjab in 1966, the truncated Punjab state in 1971 had 109 urban centres, including Chandigarh as its capital. Punjab had an urban population of 332,944 persons (24.59 per cent of its total population) in 1971. During 1961-71, the state had registered a negative growth rate in its urban population due to the loss of territories and towns. Amritsar continued to be Punjab’s leading city followed by Ludhiana and Jalandhar (Fig.8). It was 1.02 and 1.37 times larger than Ludhiana and Jalandhar respectively. The new state of Haryana, in comparison, had 66 urban centres, including Chandigarh as its capital, in 1971. The urban population of Haryana constituted 19.84 per cent of the total state population, in comparison to 24.59 per cent for Punjab in 1971.

During this decade, Chandigarh emerged as a Class I city with a population of 218,743 persons. Among the towns of Punjab, Chandigarh ranked fourth, whereas among the towns of Haryana, it was the largest city (Figs.8 and 9). It was 1.75 times the size of the second ranked city, Rohtak, and 2.13 times larger than the third placed Ambala Cantonment. During 1961-71, Chandigarh registered a phenomenally high growth rate of 144.89 per cent, the highest among all the urban centres in Punjab as well as Haryana.
PUNJAB: Rank Size Distribution (1981)

Fig. 10
HARYANA: Rank Size Distribution (1981)

Fig. 11

Population (Log values)

CHANDIGARH
Faridabad C.A.
Rohtak
Hissar
Panipat
Karnal

Actual
Expected

Rank in size (Log values)
Broadly, in Punjab and Haryana, the actual populations of towns were higher than their expected values in 1971 (Figs.8 and 9). The exceptions to this distribution were six Class VI towns of Punjab, each with a population of less than 3,200 persons, and Haryana's smallest town, Ateli, which had a population of 1,937 persons in 1971. The pattern of actual population being higher than the expected population suggests a higher level of urbanization than expected in both the states. The trend of the bulk of urban population living in the large cities and towns was strengthened during this decade. Specifically, in Punjab, the 12 large towns (Class I and II), including Chandigarh, accounted for 56.41 per cent of the state's urban population. Similarly, in Haryana, an equal number of large towns, including Chandigarh, contained 57.78 per cent of the state's urban population. Thus, in 1971, there was a concentration of population at higher levels of the urban hierarchy in both Punjab and Haryana.

In 1981, Punjab had 135 urban centres, including Chandigarh. The proportion of urban population (26.69 per cent) was higher than the one recorded in 1971 (24.59 per cent). In 1981, Ludhiana emerged as the state's largest city, displacing Amritsar, which was now ranked second. The former was 1.02 times the size of the latter. Both Ludhiana and Amritsar were much larger than the third ranked city, Jalandhar (Fig.10). In comparison, in 1981, Haryana had 82 urban centres, including Chandigarh. The urban population of the state constituted 24.77 per cent of the total population, as compared to 19.84 per cent in 1971. The urban growth rate in Haryana during 1971-81 was 60.73 per cent. considerably higher than the urban growth rate for Punjab (49.56 per cent) during the same decade.

Chandigarh maintained its fourth rank among the towns of Punjab in 1981 (Fig.10). As in 1971, the city continued to be Haryana's leading city (379,660 persons) (Fig.11). It was 1.12 times larger than the second ranked city, Faridabad (330,864 persons). During 1971-81, Chandigarh recorded an absolute increase of 160,917 persons or a growth rate of 73.56 per cent. This made Chandigarh Punjab's second fastest growing city, next only to Bathinda (131.82 per cent), and Haryana's fourth fastest growing city, after Faridabad (285.79 per cent), Sirsa (82.48 per cent) and Sonipat (75.29 per cent). During 1971-81, Chandigarh’s growth rate (73.56 per cent) was higher than the average growth rate of the Class I cities (64.98 per cent) in Punjab as well as that of
PUNJAB: Rank Size Distribution (1991)

Fig. 12
HARYANA: Rank Size Distribution (1991)

Fig. 13
the state’s urban population (49.56 per cent). In comparison, the ten Class I cities in Haryana grew at a higher rate of 281.92 per cent. However, most of this growth was contributed by the towns located around Delhi.

The trend of actual population values of towns being higher than their expected values continued during this decade as well for both the states, that is Punjab and Haryana. The aberrations in this distribution were comprised by ten Class VI towns in Punjab, each with a population of less than 3,700 persons, and two class VI towns in Haryana with a population of less than 4,600 persons each (Figs. 10 and 11). In 1981, 48.62 per cent of Punjab’s urban population lived in its 7 Class I cities, including Chandigarh. The 18 large towns (Class I and II) in the state together accounted for 64 per cent of the state’s urban population. In comparison, in Haryana, the 10 Class I cities, including Chandigarh, had 53.2 per cent of the state’s urban population, and the 17 large towns had 68.21 per cent of the total urban population. Thus, the trend of concentration of urban population in the large towns was further strengthened in both the states during this decade.

In 1991, Punjab had 121 towns including Chandigarh, and 31.73 per cent of its population was registered as urban. Ludhiana maintained its first rank among the towns of the state and emerged as a million city in 1991 (Fig. 12). It was 1.42 times larger than the second ranked city, Amritsar. In comparison, Haryana had 95 urban centres in 1991, including Chandigarh. The urban population of the state accounted for 27.68 per cent of its total population as compared to 24.77 per cent in 1981. Haryana’s urban growth rate (42.38 per cent) was higher than the growth rate for the total population (27.14 per cent), suggesting strong migratory tendencies towards urban centres. Further, the proximity and presence of Delhi exerted a strong and positive influence on the growth of urban centres in the state (18). This factor contributed considerably to the emergence of Faridabad Complex Administration (CA) as Haryana’s largest city in 1991 (Fig. 13). Faridabad was 1.23 times the size of the second ranked city, Chandigarh. In comparison, Chandigarh ranked fourth in 1991 in Punjab after Ludhiana, Amritsar and Jalandhar. During 1981-91, although Chandigarh recorded a modest growth rate of 34.47 per cent, it was the fourth fastest growing city in both Punjab and Haryana.
ORISSA: Rank Size Distribution (1961)

Fig. 14
In 1991, the actual population values for all towns were higher than the expected values in both Punjab and Haryana. Chandigarh stands out on account of a particularly high actual population as compared to its expected population among the towns of Punjab and Haryana (Figs. 12 and 13). For this decade, however, two groups of towns had a lower actual population than expected, in Punjab, 41 towns with a population of less than 13,000 persons each, and in Haryana, 6 towns with a population of less than 6,700 persons each. The 10 Class I cities of Punjab, including Chandigarh, accounted for 56.51 per cent of the state’s urban population in 1991. A similar trend was recorded in Haryana, where the 12 Class I cities, including Chandigarh, had 58.12 per cent of the state’s urban population. Thus, the hegemony of the large cities continued unabated in both the states in 1991 as well.

Therefore, since 1961, Chandigarh has been able to compete quite successfully with large and historic towns in Punjab as well as Haryana. The impact of Delhi’s influence on the growth of towns located around it in Haryana should be taken as an exception. Chandigarh’s successful growth is corroborated by its maintenance of a high rank among the towns of Punjab as well as Haryana, and by its consistently high growth rates that made it one of the fastest growing cities in the region continuously since 1961.

BHUBANESWAR

In 1961, only 6.32 per cent of Orissa’s total population lived in its 62 towns. Cuttack was Orissa’s largest and only Class I city (146,308 persons). Bhubaneswar, the newly established state capital was recorded as a Class III town (38,211 persons). It was ranked sixth among the towns of the state, and second among the 8 Class III towns (Fig. 14). In comparison, although Chandigarh was also Punjab’s sixth largest town in 1961, it was the largest Class II town. In 1961, the actual population of all the towns in Orissa was higher than their expected populations. This attribute is similar to the one noted for Punjab in 1961. However, the striking difference between the two states was the proportion of urban population, 6.32 per cent in Orissa and 20.13 per cent in Punjab. The actual population of towns was much higher than the expected population for two groups of towns in Orissa, (i) those with a population varying between 10,000 and 16,000 persons, and (ii) towns with a population of 35,000 to 40,000 persons (Fig. 14). This
ORISSA: Rank Size Distribution (1971)

Fig. 15

ORISSA: Rank Size Distribution (1971)

Rank in size (Log values)

Population (Log values)

Cutack City
Raurkela Steel Township
Berhampur
BHUBANESWAR
Puri
Sambalpur
Raurkela Civil Township

Actual
Expected

Rank in size (Log values)

Fig. 16
pattern is suggestive of a concentration of urban population in the medium size towns, including Bhubaneswar. In 1961, out of 62 urban centres, the 30 medium towns (population between 10,000 and 49,999 persons) accounted for 48.26 per cent of the state’s urban population. In comparison, in Punjab, the large towns including Chandigarh had the bulk of the state’s urban population (45.14 per cent) in 1961.

In 1971, Orissa recorded 81 urban centres. Cuttack continued to be the largest city and was 1.54 times the size of Raurkela Steel Township, the second ranked city (Fig.15). During 1961-71, Bhubaneswar registered a rapid growth in both its rank and population. In comparison to its sixth rank and Class III status in 1961, Bhubaneswar emerged as a Class I city, ranking fourth next to Cuttack, Raurkela Steel Township and Berhampur in 1971 (Fig.15). Its high growth rate (176.07 per cent) made it the fastest growing city in Orissa during 1961-71. Further, Bhubaneswar’s growth rate was higher than the average urban growth rate for the state (60.30 per cent), but lower than the growth rate for the Class I cities (278.88 per cent). Orissa’s four Class I cities, including Bhubaneswar, accounted for 30.03 per cent of the state’s urban population. The actual population of all towns in the state was higher than the expected values (Fig.15). However, in 1971, only 8.40 per cent of its total population lived in urban centres. In comparison, in 1971, the proportion of urban population in Punjab and Haryana was 24.59 per cent and 19.84 per cent respectively.

In 1981, Orissa had 108 towns. Cuttack continued to be the state’s largest city. It was 1.34 times larger than Bhubaneswar, which had replaced Raurkela as Orissa’s second largest city. This represented an improvement over its fourth rank in 1971 (Figs.15 and 16). Bhubaneswar registered a growth rate of 107.80 per cent during 1971-81, making it Orissa’s fastest growing city during this decade as well. Its growth rate was higher than the state average urban growth rate (68.54 per cent) as well as that for the Class I cities (99.35 per cent). In comparison, during this decade, Chandigarh was Punjab’s second fastest and Haryana’s fourth fastest growing city. The actual population for all the towns in Orissa in 1981 was considerably higher than their expected values (Fig.16). However, only 11.79 per cent of the state’s population was registered as urban. The six Class I cities of Orissa, including Bhubaneswar, had the bulk of the state’s urban
ORISSA: Rank Size Distribution (1991)

Fig. 17
population (35.53 per cent). This trend is suggestive of a concentration of population in the large cities.

In 1991, Orissa had 124 towns that accounted for 13.43 per cent of the state's total population. The planned capital city, Bhubaneswar, emerged as the state's largest city, displacing Cuttack from its traditional premier position (Fig. 17). In fact, Bhubaneswar (411,542 persons) was 1.02 times larger than Cuttack city (402,390 persons). Bhubaneswar continued to be the state's fastest growing urban centre, registering a growth rate of 87.73 per cent during 1981-91. This was higher than both the average urban growth for the state (36.16 per cent) and the seven Class I cities (60.43 per cent). The actual population for all towns in Orissa continued to be higher than their expected values in 1991 (Fig. 17). The only exception to this distribution was the state's smallest town, Paradip Phosphates. Nevertheless, Orissa was still one of India's less urbanized states, with only 13.43 per cent of the total population living in towns. In comparison, while the towns of both Punjab and Haryana also had higher populations as compared to their expected values, the proportion of urban population was much higher – 31.73 per cent and 27.68 per cent respectively. Orissa's urban growth rate (36.16 per cent) was higher than the total growth rate (20.06 per cent), indicating the role of migration in the growth of towns. This characteristic had been noted for the previous decade also (19). Approximately 61 per cent of Orissa's urban population lived in the seven Class I cities, including Bhubaneswar. This is a continuation and strengthening of the trend of large towns accounting for the bulk of urban population in the state.

Thus, since its establishment in 1948, Bhubaneswar has registered a considerable improvement in its rank, from sixth in 1961 to first in 1991, as well as status, from a Class III town in 1961 to Class I since 1971, and has also recorded consistently high growth rates, 176.07, 107.80 and 87.73 per cent during 1961-71, 1971-81 and 1981-91 respectively. It surpassed its proposed target of 40,000 persons way back in the early 1960’s.
GUJARAT: Rank Size Distribution (1971)

Fig. 19

- Ahmadabad
- Surat
- Vadodara
- Rajkot
- Bhavnagar
- Jamnagar
- GANDHINAGAR

Actual

Expected

Population (Log values)

Rank in size (Log values)

0.2 0.4 0.6 0.8 1.0 1.2 1.4 1.6 1.8 2.0 2.2 2.4

3.5 3.6 3.7 3.8 3.9 4.0 4.1 4.2 4.3 4.4 4.5 4.6 4.7 4.8 4.9 5.0 5.1 5.2 5.3 5.4 5.5 5.6 5.7 5.8 5.9 6.0 6.1 6.2 6.3
GANDHINAGAR

The state of Gujarat formally came into existence in 1960. Ahmadabad continued to function as its capital till 1970, when the government offices were shifted to Gandhinagar, the new capital, located 29 kms. away.

In 1961, there were 181 towns in Gujarat. Ahmadabad, a 'million city' with a population of 1,149,918 persons, was the state’s leading city (Fig. 18). It was 3.58 times larger than the second ranked city, Vadodara (298,398 persons). The actual population for all towns in Gujarat was lower than the expected values in 1961. This pattern is in sharp contrast to the one identified for Punjab, Haryana and Orissa. Such a pattern is surprising considering that in 1961, Gujarat, with 25.76 per cent of its total population registered as urban, was India’s third most urbanized state after Maharashtra (28.22 per cent) and Tamil Nadu (26.69 per cent). In comparison, though, Punjab and Orissa appear overurbanized in 1961, their urban population constituted 20.13 per cent and 6.32 per cent of their total populations respectively. The bulk of urban population in Gujarat was registered in the six Class I cities (42.42 per cent) of the state in 1961.

In 1971, Gujarat had 216 towns. Ahmadabad continued to be the state’s largest city. It was 3.37 times larger than the second ranked city, Surat, which had emerged as the second largest city of Gujarat after displacing Vadodara (Fig. 19). Gandhinagar, the new state capital, enumerated for the first time in 1971, was registered as a Class III town with a population of 24,055 persons. It ranked sixty-third among the towns in the state. Specifically, among the 42 Class III towns in Gujarat, Gandhinagar ranked thirty-eighth. This category of towns registered a low growth rate (3.25 per cent) during 1961-71 and accounted for only 17.72 per cent of the state’s urban population. In comparison, by 1971, both Bhubaneswar and Chandigarh had emerged as Class I cities. The actual population of all towns in Gujarat in 1971 continued to be lower than their expected values. In particular, the actual population was strikingly lower than the expected values for the large towns having populations between 50,000 and 200,000 persons (Fig. 19). Nevertheless, with 28.08 per cent of its population registered as urban, Gujarat maintained its rank as India’s third most urbanized state after Maharashtra (31.17 per cent) and Tamil Nadu (30.26 per cent) in 1971.
GUJARAT: Rank Size Distribution (1981)

Fig. 20
GUJARAT: Rank Size Distribution (1991)

Fig. 21
In 1981, Gujarat had 255 towns. Ahmadabad continued to dominate the urban hierarchy in the state (Fig.20). Its population was 2.78 times the size of the second ranked city, Surat. In fact, in 1981, Ahmadabad was the sixth largest Indian city and was among the country’s twelve metropolises. During 1971-81, Gandhinagar recorded a high growth rate of 160 per cent, the highest among all the towns in Gujarat. It also improved its position from sixty-third town in the state in 1971 to twenty-eighth among the towns in the state. In 1981, it emerged as a Class II town (62,433 persons), improving its status from a Class III town in 1971. Gandhinagar’s growth rate was much higher than both the state average urban growth rate (41.42 per cent) and the growth rate for the Class II towns (53.51 per cent). In comparison, while Chandigarh and Bhubaneswar had also recorded high growth rates during this decade (73.56 per cent and 107.80 per cent respectively), both were Class I cities in 1981.

The actual population for all towns in Gujarat was lower than their expected values. The sole exception to this distribution was the third ranked city, Vadodra, whose actual population exceeded the expected value (Fig.20). Such a pattern was in direct contrast to Orissa and Punjab, in which the actual population of all the towns was more than their expected values. Gujarat, in comparison, had a high proportion of urban population (31.10 per cent) in 1981, and ranked as the fourth most urbanized state in India after Maharashtra (35.03 per cent), Tamil Nadu (32.95 per cent) and Goa (32.03 per cent). The eleven Class I cities of Gujarat accounted for half of the state’s urban population (50.14 per cent), while the twenty-seven Class II towns, including Gandhinagar (ranked seventeenth among these), had only 17 per cent of the state’s urban population.

In 1991, Gujarat had 264 towns. Ahmadabad continued to be the state’s leading city. It was 1.92 times larger than the second ranked city, Surat. In 1991, both Surat and the third ranked city, Vadodara, emerged as ‘million cities’. Thus, the urban system of Gujarat, focused on these three metropolises, became polynucleated (Fig.21). Gandhinagar emerged as a Class I city (121,746 persons) in 1991. It ranked eleventh among the urban places in the state. During 1981-91, it recorded a high growth rate of 94.97 per cent, which was higher than the state average for urban population (28.86 per cent) as well as the average growth rate of the 15 Class I cities (46.48 per cent).
City Region of Chandigarh (1962)

Source: Kaur, 1962, p.21
The actual population of urban places in Gujarat continued to be lower than their expected values (Fig. 21). The exceptions to this distribution were the three largest cities, Ahmadabad, Surat and Vadodara, where the actual population exceeded the expected values. Gujarat continued to be one of India’s most urbanized states, having 33.07 per cent of its total population registered as urban. The comparative figures for Orissa, Haryana and Punjab in 1991 were 13.43 per cent, 27.68 per cent and 31.73 per cent respectively. The fifteen Class I cities of Gujarat had the bulk of the state’s urban population (57.03 per cent), a common feature of India’s urbanization.

**GROWTH AS A REGIONAL CENTRE**

**CHANDIGARH**

The earliest geographical study on the functional interaction between Chandigarh and its surrounding region was undertaken as far back as in 1962 (20). On the basis of three criteria, namely milk and vegetable supply and commuting, it was found that Chandigarh’s umland covered an area of 129 sq.miles (206.40 sq.kms). The presence of pre-existing sub-centres such as Kalka, Kharar, Morinda and Kurali exerted a restricting influence on the extent of Chandigarh’s service area (Fig. 22). An overview of social, cultural and economic services available within the city suggested a limited impact of Chandigarh on its surrounding region. The study concluded that ‘Chandigarh is a new city and to expect a closer integration with the surrounding region would be futile and perhaps too much in a short span of one decade. The integration with the surrounding region is proceeding at a slow rate’ (21).

In 1963, another study focusing on the regional relationship of Chandigarh through vegetable supply to the city, was conducted (22). This study revealed that Chandigarh’s vegetable supply zone covered 175 sq.miles (281.63 sq.kms.) and included 171 villages and 4 towns. That this zone provided only one-fourth of the city’s vegetable requirements indicated that Chandigarh had yet to develop a strong interaction with its surrounding region.

In 1970, another study to demarcate the umland of Chandigarh was undertaken with the following objectives: (a) to delimit the umland of Chandigarh, (b) to measure the intensity of functional relations of various parts of the umland, (c) to identify the...
City Region of Chandigarh
(1968/1970)


Fig. 23
service centres of various orders situated within the umland, and (d) to discover how the new city of Chandigarh had built up its umland through the process of umland capture of pre-existing centres (23). The seven criteria selected for identifying Chandigarh’s umland were agriculture, milk and vegetable supply, education (college and university), hospital service, retail sale and commuting. The study concluded that while milk, vegetable supply and commuting established the strongest links between Chandigarh and its surrounding region, retail sale and agricultural produce supply had a limited extent. Further, hospital service and college and university education provided only weak links between the city and its region. Chandigarh’s umland was found to cover an area of 1,000 sq.kms and included 395 villages and 7 towns. In general, the umland extended up to 35 kms in all directions from the city, except in the north and east, where the Shivalik Hills and Choes (seasonal stream) infected tract restricted its areal extent to about 10 kms only (Fig.23). It was also noted that the intensity of functional interaction was a function of distance, transport links, size of settlement and the proportion of Scheduled Castes population. The study identified 44 service centres in the umland of Chandigarh and concluded that the new city of Chandigarh had built up its umland by capturing the whole or parts of the erstwhile umlands of other service centres, by weakening the functional integration between the old service centres and their umlands and by establishing new types of functional links with the surrounding areas.

**TABLE 10: CHANDIGARH CITY: AREAS INCLUDED IN THE ISCR**

<table>
<thead>
<tr>
<th>Name of the Block/Tehsil</th>
<th>Area (sq.kms)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PUNJAB</strong></td>
<td></td>
</tr>
<tr>
<td>1. 58 villages of Chamkaur Sahib Block (Rupnagar District)</td>
<td>117.10</td>
</tr>
<tr>
<td>2. Kharar Tehsil (Rupnagar District)</td>
<td>689.60</td>
</tr>
<tr>
<td>3. Dera Bassi Block (Patiala District)</td>
<td>341.30</td>
</tr>
<tr>
<td>4. 63 villages of Bassi Pathana Block (Patiala District)</td>
<td>122.00</td>
</tr>
<tr>
<td>5. 73 villages of Rajpura Block (Patiala District)</td>
<td>240.30</td>
</tr>
<tr>
<td><strong>HARYANA</strong></td>
<td></td>
</tr>
<tr>
<td>1. Kalka Tehsil (Ambala District)</td>
<td>262.90</td>
</tr>
<tr>
<td>2. 38 villages of Naraingarh Block (Ambala District)</td>
<td>93.60</td>
</tr>
<tr>
<td>3. Raipur Rani Block (Ambala District)</td>
<td>440.50</td>
</tr>
<tr>
<td><strong>CHANDIGARH U.T.</strong></td>
<td></td>
</tr>
<tr>
<td>1. 34 villages of Chandigarh block</td>
<td>114.00</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>2421.30</td>
</tr>
</tbody>
</table>

City Region of Chandigarh (1982)

Note: The limits of Chandigarh on this map include the towns of Mohali, Mani Majra and Panchkula

In order to promote the growth of Chandigarh in a regional perspective and ensure balanced regional development, a region around Chandigarh termed the Inter State Chandigarh Region (ISCR) was formally constituted in 1982 (24). It was delineated taking into account five factors – physiography, existing administrative boundaries, existing levels of development, possible potential of development and the influence zone of major urban centres around Chandigarh. The ISCR, with Chandigarh Union Territory as its nucleus, extends over 3 districts in Punjab and Haryana (Table 10). It covers an area of 2421.30 sq.kms, with an average radius of about 35 kms around Chandigarh (Fig.24). The Region included 948 villages in 1981 and, excluding Chandigarh Union Territory, 11 urban centres. The core of the ISCR is the Chandigarh Urban Complex, comprising Chandigarh, Mohali, Panchkula, Manimajra, Chandimandir Cantonment and the Air Force Station. The objectives of the ISCR Plan included, (a) an efficient organization of urban places in the Region, (b) a rational and orderly growth of the Chandigarh Urban Complex, (c) an integrated and coordinated development of transport links and water supply within the broad regional framework, and (d) the development of healthy rural-urban relationships and environment protection (25).

The impact of Chandigarh on the ISCR is evidenced in the changes in some of its demographic, social and economic attributes. Important among these attributes are (i) population growth (ii) sex ratio (iii) literacy rate (iv) occupational structure (v) industrial development (vi) development of amenities as health and education, and (vii) transport links. Between 1951 and 1981, the ISCR experienced an addition of 1,030,570 persons or an increase of 4.65 per cent per annum in its population. Similarly, the sex ratio in the region (excluding Chandigarh UT) improved from 820 females per 1000 males in 1951 to 837 females per 1000 males in 1981. This may be attributed to the faster decline in female mortality than that of males, and to the availability of education and health facilities (26). Similarly, the literacy level increased considerably from 13 per cent in 1951 to 30 per cent in 1971 and 40 per cent in 1981. The increase was more pronounced in case of female literates – from only 4 per cent in 1951 to 30 per cent in 1981. The highest and the fastest change in the above attributes was in settlements located close to Chandigarh, settlements along the major roads, especially the Chandigarh – Kalka Road.
and the Chandigarh – Kharar Road, and in settlements around relatively large urban
centres located within the ISCR (27).

Among the economic indicators, the percentage of non-agricultural rural workers
increased from 27 per cent in 1951 to 37 per cent in 1981. The highest increase in this
attribute took place in Kalka tehsil (Haryana). The presence of industrial units in places
like Panchkula, Surajpur and the HMT Township in Haryana and Mohali in Punjab
provided new employment avenues for villages located in their proximity. Similarly,
villages in the proximity of Chandigarh registered a significant increase in the percentage
of their rural non-agricultural workers (28).

In 1951, the Ropar-Kalka road was the only major road in the area. By 1981, the
ISCR was served by two National Highways, the Chandigarh - Shimla Road (NH 22),
and the Chandigarh–Ropar-Manali Road (NH 21), and three state highways,
Chandigarh-Patiala, Chandigarh-Ludhiana and Chandigarh-Shahbad, in addition to a
large number of district roads. Efficient bus services connect Chandigarh to all the
administrative headquarters and towns in Punjab, Haryana, Himachal Pradesh and Delhi.
By 1981, 87 per cent villages in the ISCR were served by pucca roads. The ISCR is
traversed by two railway lines, the Delhi-Kalka and Sirhind-Nangal line. There are 11
railway stations in the Region. Efficient transport links and larger markets have promoted
industrial development in the Region. Starting with a couple of light industries in the
1950s, the ISCR had 52 large and medium units in 1981 (29). The units are mainly
located in SAS Nagar (Mohali), Kharar, Kurali and Dera Bassi (Fig.24).

Amenities, especially education and health, have improved considerably in the
ISCR. In 1951, only two villages had a high school. By 1971, 75 villages had a high or
higher secondary school, and by 1981 their number had increased to 95. In 1981, the
ISCR had 18 colleges, thirteen of which were located in Chandigarh. Similarly, there
were 14 hospitals in the ISCR, with specialized facilities available in Chandigarh. From
a complete absence of piped water supply in the villages of the ISCR in 1951, in 1981,
267 villages had this facility (30).

The process of urbanization in the ISCR during this period was marked by an
increase in the number of towns from 5 in 1951 (Morinda, Kharar, Kurali, Kalka and
Naraingarh) to 11 urban centres in 1981. The new towns were SAS Nagar (Mohali),
Among these SAS Nagar (Mohali) and Panchkula were planned as satellite towns of Chandigarh.

It is possible to identify zones of transformation within the ISCR. The highest degree of change is noticeable in the area immediately surrounding Chandigarh. It consists of villages and towns along the Chandigarh – Kalka road, Chandigarh-Zirakpur road and Chandigarh-Kharar road. The Chandigarh Urban Complex lies in this zone. A zone of moderate transformation is located in the west, north-west and south-west parts of the ISCR in the area in the state of Punjab. The zone of little transformation in the east, north-east and south-east peripheries of the ISCR comprises the hilly areas of Kalka tehsil, Morni Hills and the heavily dissected areas near River Ghaggar.

It has been estimated that by 2001, the population of the ISCR will be 25 lakh persons, 66 per cent of which will be in urban areas and the rest in rural areas. The future plan proposals include balanced development of industry, trade and commerce, policies for environment conservation and rural development, as well as the decentralization of government and semi-government functions from Chandigarh to Panchkula and Mohali.

BHUBANESWAR

One of the earliest and comprehensive study on Bhubaneswar city and its environs appeared in 1978 (33). It employed a host of criteria for studying functional interaction between Bhubaneswar and its surrounding region. In the first instance, 14 villages close to Bhubaneswar were surveyed with respect to literacy, occupational structure, presence of schools, urban services (electricity), commuters and migrants to the city. None of these variables showed any correlation with distance from the city. On the basis of this survey, the study concluded that, ‘modern Bhubaneswar, with two decades standing, is behaving like a superimposed structure in its so-called catchment area’ (34). The study also undertook a more detailed analysis of selected villages in order to gauge the intensity and magnitude of Bhubaneswar’s influence. The criteria adopted were density of population, literacy and proportion of agricultural workers. Three types of villages were surveyed, (i) those located within the fringe zone of Bhubaneswar city, (ii) those spatially connected with the city but located outside the city boundary and, (iii) villages located at a distance of 10 kms from Bhubaneswar. The survey suggested that it was in
the villages to the north and south of the city that a continuum could be observed. This was related mainly to the good road and railway links. On the western side, the transition from urban to rural areas was abrupt, mainly due to poor connectivity with the city and the presence of the Chandaka forest. Physical barriers restricted the city’s impact to its east and south-east. The survey concluded that urban influence of the city was restricted to a very narrow zone and villages located a little away from the city retained their rural character. In 1971, Bhubaneswar had direct road and railway links with only four out of the 13 district headquarters in Orissa. Thus, the study pointed out that ‘the position of Bhubaneswar from the accessibility point of view, both as a point and centre of control on connecting links was not satisfactory. Its status was overshadowed by the close proximity of a stronger centre, Cuttack’ (35).

The study also identified the Bhubaneswar – Cuttack Urban Complex, defined as an ‘advanced centre of industrial and other economic activities. It had a number of urban centres located closely without any centralization of economic and functional activities in one centre’ (36). The proposed Bhubaneswar – Cuttack Urban Complex included five of the fastest growing urban centres of Orissa, namely, Bhubaneswar, Cuttack, Jatani, Khordha and Chowdar. The study identified Cuttack as a service and trade town, Jatani as a transport and service centre, Chowdar as an industrial town, Khordha as having a high concentration of workers in the primary sector and in services, while Bhubaneswar was also a service centre. According to the study a system of functional interdependence had developed among these five urban centres. The population potential was found to be very high between Bhubaneswar and Cuttack as compared to other centres. This was because of the close proximity of the two cities, within 29 kms of each other, and the functional interaction between the two on account of services, commerce and good transport links. Among these five urban centres, only Bhubaneswar was an implant, the others were pre-existing evolved centres.

A complex similar to the one described above had also first been suggested by Koenigsberger while preparing the Bhubaneswar Master Plan in 1948 (37). More recently, the Bhubaneswar Development Authority (BDA) also identified a Capital Sub-Region, extending from Chowdar and Nirgundi in the North, to Khordha in the south, from Barang, Nandan Kanan and Naraj in the west to Konark and Puri in the east (38).
The BDA, having jurisdiction over the Bhubaneswar Development Area, spread over 57,616.847 acres (233.17 sq. kms.), has prepared three comprehensive plans for the Bhubaneswar Development Area and Perspective Plans upto the year 2001. In the Comprehensive Plans, Bhubaneswar is envisaged as a dynamic city having cultural, educational, commercial, tourist and industrial functions. The Plans propose objectives and measures for orderly physical development, economic growth and administrative effectiveness of the capital city.

At present, the major problem hindering the functional integration of Bhubaneswar with its surrounding area is poor transport links. Despite being the state capital, Bhubaneswar had direct train links with only five out of the thirteen district headquarters in 1988. The city is also poorly linked to neighbouring towns in Madhya Pradesh and Bihar. Further, the paucity of housing facilities has resulted in an intense commuter traffic. In 1988, there were 4,880 daily commuters to Bhubaneswar mainly from Cuttack (29 kms), Jatani (42 kms) and Puri (59 kms) (39). The BDA Reports urgently recommended the introduction of efficient suburban train services to the city.

DECADAL INTRA-CITY GROWTH (1961-1991)

CHANDIGARH

Chandigarh was planned for a population of five lakh persons. In the First Phase, thirty Sectors were to be developed to contain 1.5 lakh persons, and in the Second Phase, an additional seventeen Sectors were to be developed to house 3.5 lakh persons. Evidently the Second Phase Sectors were proposed to be high density Sectors. The planners initially had justifiable fears whether Chandigarh would ever grow to its projected size of five lakh persons, particularly since the city was not a centre of natural resources, and its only function, administration, was non-economic. Contrary to such apprehensions, Chandigarh has grown at a rapid rate, averaging 471.60 per cent growth during 1961 to 1991. Specifically, in 1957, the city had a population of 38,377 persons (40). By 1991, it had increased to 510,565 persons. Thus, within a span of four decades since its inception, the city has exceeded the projected figure. However, during this span of forty years, the city’s population grew at varying rates, 144.89 per cent during 1961-71, 73.56 per cent during 1971-81 and 34.47 per cent during 1981-91. Differential growth
CHANDIGARH CITY
Growth of Population
1961-71
(Data by Sectors)

Fig. 25

Boundaries
Town
Sector
Sector number

Figures outside the circle indicate per cent
City average: 144.89 per cent

Enumerated for the first time in 1971
rates were also recorded by different Sectors in the city. The intra-sector patterns of population growth in Chandigarh during different decades are detailed below.

The Decade 1961-71

During this decade, Chandigarh recorded one of the highest growth rates for individual towns in the country, 144.89 per cent. This rapid growth of population in the city may be attributed to two factors. Firstly, the initial settlement of the city and the associated development tendencies, characterising a small base of population at the start of the decade. Consequently, the population in nearly all the Sectors doubled during 1961-71. Secondly, the Reorganization of Punjab state in 1966 made Chandigarh the capital of three administrative units, that is, of the states of Punjab and Haryana and the Union Territory of Chandigarh, and resulted in an increase in the number of government employees to be stationed in the city.

During 1961-71, the population growth in different Sectors of the city varied between 25768.75 per cent in Sector 29 to 26.81 per cent in Sector 14. Generally, the Sectors registering high and very high growth rates were located along the southern periphery of the then developed parts of the city (Fig.25). The northern Sectors, planned as low density Sectors, recorded low rates of growth of population, in conformity with the city plan proposals.

The following four types of areas can be identified on the basis of the decadal variation in growth rates in the Sectors of the city (Fig.25):

(i) Areas of Very High Growth (More than 293 per cent)

(ii) Areas of High Growth (110.92 to 293 per cent)

(iii) Areas of Low Growth (68 per cent to 110.92 per cent)

(iv) Areas of Very Low Growth (Less than 68 per cent)

(i) Areas of Very High Growth (More than 293 per cent)

This category includes Sectors 29, 28, 21, 15, 25 and 24 in order of their rates of growth. The highest growth rate among these Sectors was recorded in Sector 29, 25768.75 per cent, and the lowest, 293.12 per cent, in Sector 24. Sectors 29 and 28, which registered the highest and the second highest growth in this category, are located on the eastern periphery of the city adjacent to the Industrial Area (Fig.25). Due to their
vicinity to the Industrial Area, these two Sectors were allocated housing for industrial workers in the city plans. In addition to industrial housing in Sector 29, institutional housing for the employees of The Tribune, a major regional newspaper published from the city, was also developed. Similarly, Sector 28, apart from industrial housing, also had public housing for the lower ranked government employees (Types VIII to XIII). In comparison, in Sector 21, which recorded the third highest growth rate during this decade, there was a complete absence of government housing and provision of only private housing was made. The majority of the house plots in this Sector were small in size and intended for the middle and lower income groups.

In Sector 15, the bulk of housing was in the private sector, with provision for only about 150 government houses (Types XI and XII) for the lower income/ranked employees. Sector 15 adjoins the university campus (Sector 14), the PGI campus (Sector 12) and the undergraduate colleges located in Sectors 10 and 11. Its high growth rate during this decade (345.20 per cent) was related to its central location to these institutional Sectors. Sector 25 was reserved for providing additional housing for employees of the Panjab University located adjacent to it in Sector 14 (Fig.25). However, its peripheral location to the then built up area of the city but close proximity to the University and PGI campuses, which offered employment for household and menial services, attracted squatters. As a result, this Sector became the site for the development of a large slum. Further, in 1964, Sector 25 was selected as a site for the settlement of an ‘authorized’ colony as part of the official resettlement of temporary and informal workers in the city. In Sector 24, both government and institutional housing were provided. The former was meant for a mixture of income categories, from the high income Type III houses to the smallest Type XIV houses, intended for sweepers. The institutional housing was for the employees of the PGI.

Interestingly, inspite of their high growth rates, none of the Sectors in this category exceeded their planned populations either in 1961 or in 1971. This can be related to the plan provision of public or institutional housing in Sectors 29, 28 and 24. The very high growth rates registered in Sectors 21 and 15 indicate the trend of high growth in Sectors having dominantly private housing.
(ii) **Areas of High Growth (From 110.92 to 293 per cent)**

Sectors 8, 18, 11, 10, 20, 12 and 27 recorded high growth rates in the same order during 1961-71. Locationally, these Sectors adjoin the Sectors that recorded very high growth during this decade (Fig. 25). The growth rate in this group of Sectors varied between 255.12 per cent in Sector 8 and 111.99 per cent in Sector 27.

Sectors 8 and 18, which registered the highest growth rates in this category, have only private housing. Sectors 11 and 10 have predominantly private housing and some government housing (Types XI to XIII) for the lower ranked government employees. In addition, these two Sectors have undergraduate and professional colleges and some other educational institutions as well. In comparison, Sector 20 had dominantly government housing for the lower income categories and some private housing. Due to the small size of plot of houses, both public and private (less than 7.5 marlas), and the consequent possibility of a high concentration of population, Sector 20 emerged as not only the most densely populated sector in 1971 (23,447 persons per sq km) but also exceeded its target population of 23,200 persons. Sector 12 developed as a completely institutional Sector housing the PGI, the Engineering and the Architecture colleges along with the associated housing for their faculty and students. The high growth rate in this Sector during this decade can be attributed to the early stage of development of these institutions. In comparison, Sector 27 had both private and public housing. The characteristically small plot sizes (less than 7.5 marlas) and its location adjacent to Sector 28, which housed the industrial workers, resulted in this Sector exceeding its planned target of 11,500 persons in 1971.

Thus, among the Sectors included in this category the highest rates of growth were recorded by those Sectors which had only private housing (Sectors 8 and 18). In comparison, the Sectors with institutions and associated housing recorded comparatively moderate growth rates (Sectors 11, 10 and 12), and the Sectors with small size of houses, whether government or private, exceeded their planned populations (Sectors 20 and 27).

(iii) **Areas of Low Growth (From 68 to 110.92 per cent)**

Sectors 9, 30, 16, 22, 7, 2 and 23 recorded low growth rates in the same order during 1961-71. The growth rate varied between 109.86 per cent in Sector 9 and 68.38 per cent in Sector 23.
Sector 9 was planned as a low density Sector with only private housing. The large size of plots and consequently smaller number of houses account for its low rate of growth. However, the initial spurt of development during 1961-71 contributed to its registering the highest growth rate within this category. Its population more than doubled, from 1,024 persons in 1961 to 2,149 persons in 1971. It needs to be noted that high growth rates even among Sectors placed in this category of overall low growth rates during 1961-71 was recorded for a Sector with private housing. Sector 30 developed as an institutional Sector, housing the Central Scientific Instruments Organization (CSIO) and its campus and housing for the employees of the Posts and Telegraph Department. The population of this Sector also doubled during this decade, from 1,695 persons in 1961 to 3,224 persons in 1971. An indication of the rapid increase in the population of the city is evident from the fact that Sectors which registered 100 per cent population growth during 1961-71 could only be placed in the category of areas of low growth.

Sector 16 was planned as a low density Sector with private as well as public housing and the General Hospital and its campus. The government housing in this Sector provided an intermixing of various ranks (Categories V to VII, IX and XIII). Sector 22 was the first residential Sector to be planned and developed in Chandigarh with both private and public (Types IX to XIII) housing. This Sector exceeded its planned population of 21,900 persons in 1971, due to its early start and a well developed infrastructure within it. In fact, in 1957 itself, Sector 22, along with Sectors 19 and 23, had over half of the city's population of 38,377 persons (41). Sector 7 adjoins the low density Sectors located to its north, namely Sectors 2 to 6 (Fig.25). It had predominantly mixed public housing for various income groups and ranks – Type IV and VI to XIII. Sector 2, a low density Sector, had relatively large sized plots, both private and public. The latter were for the Chief Justice and State Ministers. In comparison, Sector 23, which recorded the lowest growth rate within this category, had predominantly public housing for the lower ranked employees (Types IX and XI to XIII). Along with the adjacent Sector 22, Sector 23 was one of the earliest Sectors to be developed in Chandigarh. This Sector also exceeded its planned population of 15,700 persons in 1971.

Thus, among the Sectors registering low rates of growth as compared to other Sectors in the city, the highest rates were recorded by Sectors with only private or
institutional housing (Sectors 9 and 30). Sectors with an intermixing of public and private housing recorded comparatively lower growth rates (Sectors 7, 16), while those which were among the first to be developed and had mainly public housing (Sectors 22, 23) exceeded their planned population targets inspite of registering a comparatively low rate of growth. This was to emerge as a major characteristic of the growth pattern of population in Chandigarh.

(iv) Areas of Very Low Growth (Less than 68 per cent)

This category includes Sectors 26, 3, the Industrial Area, Sectors 4, 19, 5 and 14 in order of their rates of growth. The growth rate in these Sectors varied between 54.23 per cent in Sector 26 and 26.81 per cent in Sector 14.

Sector 26, located towards the north-eastern periphery of the city, was proposed as an area for bulk transport and trade of grains, vegetables and other commodities due to its peripheral location and easy access from the arterial roads and the railway station. In addition it was also to house some educational and technical institutions and their hostels etc. However, till 1971, it had developed only partially. Sectors 3, 4 and 5, located towards the northern margins of the city, were planned as low density high income group Sectors having large sized plots, both private and public. The latter were meant for the high ranked officials (Types II and III). In addition, in Sectors 3 and 4, flats and hostels for Legislators were also planned. Among these two Sectors, number 4 exceeded its planned population of 600 persons marginally by 23 persons in 1971. Sector 19 was among the early developed Sectors in the city. It had both private and public housing, the latter for the middle and lower ranked employees. Sector 14, an institutional Sector, housing the Panjab University and its campus, recorded the lowest growth among the various Sectors in the city. The very low growth rate in the First Phase Industrial Area may be attributed to its partial development during 1961-71.

The Peripheral Areas, comprising temporary hutments in Sectors 14, 26 and 30, recorded a growth rate of 162.27 per cent during 1961-71.

During 1961-71, three Sectors, numbers 6, 1 and 17 recorded a decline in their populations by 95.22, 92.95 and 51.66 per cent respectively. These Sectors also recorded the lowest densities of population among various Sectors in Chandigarh in 1971. All three Sectors are institutional areas – Sector 6 has the Punjab and Haryana Governors’
CHANDIGARH CITY
Growth of Population
1971-81
(Data by Sectors)

Dadu Majra

Per cent
243.00
53.32
23.19

Enumerated for the first time in 1981

Figures outside the circle indicate per cent
City average: 73.56 per cent

Fig. 26
Residences, Sector 1 houses the Administrative Complex, and Sector 17 is the Commercial and Business Centre of the city. While the negative growth in Sectors 1 and 6 may be related to specific administrative changes, the decline in the population of Sector 17 was probably due to the completion of most of the construction work and the subsequent shifting out of the labour force engaged in this activity.

A characteristic feature of the growth of Chandigarh during this decade is the strong correlation between the provision of private housing and the high rates of growth, whether at the Sector level or within individual categories identified above. Similarly, the presence of government housing, particularly the one developed for the lower and middle ranked employees, also resulted in fairly high growth rates. This may be attributed to the small size of plots, resulting in a high intensity of population concentration as well as vertical development.

**The Decade 1971-1981**

During this decade, the city recorded an average decadal growth rate of 73.56 per cent. There were thirty-eight Sectors in the city, twenty-nine of these had been developed during the Phase I and nine Sectors during Phase II. The highest growth rates were recorded in the newly developed Phase II Sectors, located along the then southern limits of the city (Fig. 26). Of the total increase of 160,817 persons during this decade, 80,163 persons or 49.84 per cent were enumerated in the Phase II Sectors and 80,654 persons or 50.16 per cent of the total increase was registered in the Phase I Sectors. Also, seventeen Sectors, all of which were Phase I Sectors, exceeded their planned population targets in 1981. Among the thirty-eight Sectors in the city, only Sector 2 recorded a decline in its growth rate (by 10.50 per cent).

The vitality of this decade is associated with, (i) the development of an additional nine Sectors in the Second Phase of the city’s development, (ii) the development of the Second Phase Industrial Area on the eastern periphery of the city, and (iii) the constitution of the Chandigarh Housing Board in 1976. The Board constructed houses for four income groups (high, middle, low and economically weaker sections) in the new Phase II Sectors. These houses were generally blocks of flats, indicating the increasing demand for accommodation and the greater intensity of development envisaged in the
new Sectors. This decade also saw the emergence of satellite towns on the periphery of Chandigarh, SAS Nagar (Mohali) and Panchkula, promoted by the Punjab and Haryana governments respectively. The full impact of these two towns on the city’s growth would be realized only during the following decade. Nevertheless, their presence, as also of the cantonment at Chandimandir, the Air Force Base and the industrial township of HMT, Pinjore, all located within the original Periphery Control Area, indicated the immense economic investment and the potential of locational proximity to Chandigarh.

On the basis of the decadal rates of population growth in different Sectors, four types of growth areas can be identified in the city (Fig.26):

(i) **Areas of Very High Growth (More than 243 per cent)**
(ii) **Areas of High Growth (53.32 per cent to 243 per cent)**
(iii) **Areas of Low Growth (23.19 to 53.32 per cent)**
(iv) **Areas of Very Low Growth (Less than 23.19 per cent)**

(i) **Areas of Very High Growth (More than 243 per cent)**

This category comprises of Sectors 37, 38, 26, 06, the Industrial Area, Sectors 32, 47, 35, 34, 33 and 30 in order of their rates of growth. The growth rate in these Sectors varied from 10801.83 per cent in Sector 37 to 243.52 per cent in Sector 30. Out of the ten Sectors included in this category, seven were developed during Phase II.

Sectors 37 and 38 which registered the highest and second highest rates of growth in the city during this decade, have private and EWS housing. Both these Sectors were among the nine newly settled Sectors of this decade, located along the southern margins of the city (Fig.26). Their peripheral location prompted the administration to initially earmark some portions in these Sectors as transit sites for the unauthorized and authorized labour tenements in the city. Sector 26 which registered the third highest growth rate during this decade, had recorded a very low growth during 1961-71, mainly due to the early stage of its development as an area for wholesale trade and goods transport by road. By 1981, these functions further developed. This also prompted a concentration of population from the poorer sections. The Sector developed slums, in addition to EWS housing provided by the government. Some labour colonies were also resettled on the peripheries of this Sector. In 1981, the Sector’s population exceeded the proposed target of 2,000 persons by almost 17,000 persons. Consequently, its density in
1981 (6481 persons per sq.km) was much higher than the low density it was planned for (1,626 persons per sq.km). Sector 6, an institutional area, having both the Punjab and Haryana Governors’ Residences, had recorded a negative growth during 1961-71. The very high growth during this decade may be associated with some temporary administrative developments, because in the following decade it again registered a decline in its population, from 156 persons in 1981 to 41 persons in 1991. The very high growth in the Industrial Area (642 per cent) may be attributed to the development of the Second Phase Industrial Area in 1971.

Sectors 32 and 47, were newly developed Phase II Sectors. In the former, housing for EWS was developed. It also attracted some unauthorized labour colonies. The latter Sector’s proximity to the Air Force Base made it attractive for the housing of defence personnel. Similarly, Sectors 35 and 34 were also new Sectors. Both these Sectors had a preponderance of private housing, as well as some unauthorized structures that were later shifted to the peripheries of the city. Sector 35 also had institutional housing for the Bhakra Beas Management Board. A city sub-centre was proposed in Sector 34, comprising administrative functions and commercial establishments. Sector 30, primarily an institutional Sector, had recorded a low growth during 1961-71. The expansion of the existing institutions and associated housing, CSIO and RBI, the addition of EWS housing, and the presence of unauthorized tenements contributed to the substantial increase in the population of this Sector, from 3,224 persons in 1971 to 11,094 persons in 1981. Its 1981 population exceeded its planned population of 10,900 persons. Sector 33, which recorded the lowest growth within this category, was also a new Sector with predominantly private housing. This Sector also had some unauthorized tenements that were later relocated elsewhere on the peripheries of the city.

Thus, the Sectors in this category, whether belonging to Phase I or Phase II, are marked by the presence of housing for the poorer sections, EWS, transit sites or unauthorized structures. In case of the Phase I Sectors, this resulted in the population exceeding the planned targets (Sectors 26,30). The majority of Sectors in this category were new Phase II Sectors with mainly private housing. Therefore, the trend of a positive association between high growth and private housing, identified during the previous decade, continued during this decade as well.
(ii) **Areas of High Growth (From 53.32 to 243 per cent)**

This category comprises of Sectors 31, 1, 36, 17, 29, 25, 7, 10 and 15 in order of their rates of growth which varied between 229.97 per cent in Sector 31 and 53.32 per cent in Sector 15. Sectors 31 and 36 were among the nine newly developed Phase II Sectors. Both these Sectors had housing developed by members of the defence forces. However, Sector 36 initially developed with private housing for the high income group.

In comparison, Sectors 1 and 17 comprise the main work areas in the city, the Capitol Complex and the City Commercial and Business Centre respectively. Both these Sectors had recorded negative growth during 1961-71. Since both are areas with restricted residential development, their high growth rates for this decade may, therefore, be attributed to temporary developments. This is supported by the fact that during the following decade, 1981-91, both these Sectors were to again record a decline in their populations.

Sectors 29 and 25, in comparison, had recorded a very high rate of growth during 1961-71. Both these Sectors had been allocated institutional housing, in Sector 29, for workers of the adjacent Industrial Area, the Tribune employees as well as EWS housing, and in Sector 25, for the employees of the Panjab University. However, by 1971, due to its location, Sector 25 had already attracted squatters, resulting in the development of a slum area. In addition, a labour colony was also resettled within this Sector. In 1981, the population of this Sector had exceeded the planned target of 9,000 persons, although almost half of the area covered by it was yet to be developed.

Sector 7 had registered a low population growth during 1961-71. Its high growth during 1971-81 may be associated with the further development of private housing and a probable spillover from the adjoining Sector 26 which recorded a very high growth rate during this decade. The population of Sector 7 in 1981 was more than its proposed population of 11,000 persons. Sector 10, which had recorded a high growth rate (167.12 per cent) during 1961-71, registered a comparatively lower growth rate (58.61 per cent) in 1971-81. However, despite its comparatively low rate of growth, it ranked among the high growth rate Sectors. Sector 15 had registered one of the highest growth rates during 1961-71, associated with its adjacent location to such institutional Sectors as Sectors 14, 12 and 10, and also due to the presence of both private and public
housing within this Sector. The rapid growth of this Sector continued during 1971-1981 as well, and in 1981 its population exceeded its target population of 16,900 persons.

Thus, within this category, the highest growth rates were recorded by Sectors developed during the Second Phase of the city's development, and which initially had private housing (Sectors 31, 36). In comparison, the early developed Phase I Sectors in this category had either attracted slum and squatter settlements or experienced a further development of the existing housing facilities (Sectors 25, 07, 15). The population of these Sectors also exceeded their planned targets in 1981.

(iii) **Areas of Low Growth (From 23.19 to 53.32 per cent)**

Sectors 11, 16, 5, 8, 24, 21, 12, 28 and 18 registered a low growth rate during 1971-81 in the same order. The growth rate in these Sectors varied between 44.18 per cent in Sector 11 to 23.22 per cent in Sector 18. All the Sectors in this category, except Sector 5, recorded considerably lower rates of growth during this decade as compared to those registered during 1961-71. However, despite declining growth rates, the 1981 populations of five Sectors, numbers 11, 16, 5, 21 and 12, exceeded their planned population targets. This suggests a trend in which some of the Sectors experience an initial rapid growth, followed by a comparatively sluggish increase in population, probably associated with a saturation level as far as housing in a Sector is concerned. Some of these Sectors may actually register a decline in their populations in later years, as indeed Sectors 11, 16 and 21, which exceeded their planned populations in 1981, did during the next decade, 1981-91.

Among the Sectors in this category, Sectors 11, 16, 5 and 28 have private as well as government housing. However, the nature of public housing varies in these Sectors. For example, in Sector 11, it is for the lower ranked employees, in Sector 16, it is for different ranks and income groups, in Sector 5, the large sized plots are for the higher ranked officials, while in Sector 28, there is industrial housing for the lower income groups. In comparison, Sectors 8, 21 and 18 have only private housing. Sector 24 has mainly institutional housing, as does Sector 12, which has the PGI, the Engineering and Architecture Colleges and their associated housing.

Thus, except for Sector 5, all the Sectors in this category, irrespective of the type of housing, registered a sluggish growth rate. At the same time, the additions in housing
facilities and other developments generally either ensured a population in excess or just around the planned targets.

(iv) **Areas of Very Low Growth (Less than 23.19 per cent)**

Sectors 9, 22, 23, 4, 20, 3, 19, 14 and 27 recorded a growth rate of less than 23.19 per cent during 1971-81. Specifically, the growth rate varied between 23.17 per cent in Sector 9 and 7.99 per cent in Sector 27. All the Sectors in this category registered a considerable slowing down of their growth rates during this decade as compared to that registered during 1961-71. However, six out of the nine Sectors in this category, numbers 9, 22, 23, 4, 20 and 27, recorded populations in excess of their planned targets in 1981. This conforms to the trend noted earlier for some Sectors with comparatively higher growth rates during this decade. Also, in keeping with this trend, many of these Sectors were to register an absolute decrease in their populations in 1991.

Among the Sectors in this category, Sector 9 was planned as a low density area with mainly private housing. In addition, its location adjacent to the City Centre prompted development of areas reserved for commercial use. This Sector exceeded its population of 2400 persons in 1981. In comparison, Sectors 22, 23, 20, 19 and 27 have private and public housing, the latter being for the lower and middle income categories. During 1971-81, these Sectors were among the most densely populated areas in Chandigarh. For example, Sector 20 had a density of 27,309 persons per sq.km. in 1981, the highest among the various Sectors in the city. Further, Sectors 22, 23, 20 and 27 had recorded populations in excess of their planned targets since 1971. During the following decade, these Sectors recorded an absolute decline in their population. This suggests that these Sectors, characterized by some of the smallest plot sizes in the city, have reached their saturation capacity, and no further growth is possible either through infilling or expansion.

In comparison, Sectors 3 and 4, located on the northern edge of the city, were planned as low density, high income group Sectors with fairly large plot sizes, both private and public. Due to their location adjacent to the Capitol Complex, flats and hostels for the state legislators were also located in these Sectors. Sector 14 is a completely institutional area, housing the Panjab University and its campus. This Sector had recorded the lowest growth rate in the city during 1961-71. In the following decade,
1981-91, like most other Phase I Sectors, it registered an absolute decrease in its population.

Sector 2 was the only Sector which recorded a negative growth rate during this decade (10.50 per cent). Located opposite the Capitol Complex, it was planned as a low density, high income group Sector. In addition, the Peripheral Areas, comprising Ram Darbar, Korsan and Dadu Majra, recorded a negative growth rate of 21.32 per cent.

During this decade of Chandigarh's growth and development, the following trends can be identified: firstly, the areas of high growth were constituted by the nine newly developed Phase II Sectors which had mainly private housing. The positive association between private housing and high growth of population in the new Sectors was a confirmation of the trend identified during the previous decade. Secondly, the development of housing for the Economically Weaker Sections (EWS) and the presence of transit colonies and squatter settlements also had a positive association with high growth rates in individual Sectors. Thirdly, a majority of the Phase I Sectors recorded populations in excess of their planned targets despite a sluggish growth. This is associated with an infilling and expansion of their housing capacities, leading in some cases, to the saturation of this capacity. In the following decade, these Sectors were to register a further deceleration in growth rates and an absolute decline in their populations.

The Decade 1981-91

The population of Chandigarh grew at the rate of 34.47 per cent during 1981-91. In absolute terms, there was an increase of 130,905 persons, out of which the thirty Phase I Sectors accounted for 30.34 per cent or 39,700 persons, and the seventeen Phase II Sectors accounted for 91,205 persons or 69.66 per cent. During the previous decade, the Phase I and II Sectors had accounted for an almost equal share of the population growth of the city. The higher proportion contributed by the Phase II Sectors is indicative of the greater concentration of population in these Sectors, located on the southern margins of the city. These figures also indicate the complexity of forces influencing both the average growth rate of the city as well as the growth rate of individual Sectors. These forces include, for example, the pull exerted by such nuclei as Mohali, Panchkula, the Industrial Area Phase II and the Air Force Base in promoting concentration of population...
CHANDIGARH CITY
Growth of Population
1981-91
(Data by Sectors)

Per cent

<table>
<thead>
<tr>
<th>Increase</th>
<th>Decrease</th>
</tr>
</thead>
<tbody>
<tr>
<td>320.00</td>
<td>38.72</td>
</tr>
<tr>
<td>11.93</td>
<td>11.90</td>
</tr>
<tr>
<td>8.02</td>
<td>22.00</td>
</tr>
</tbody>
</table>

City average: 34.47 per cent

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

Fig. 27
in their adjoining Sectors, the role of Cooperative Housing Societies, private as well as institutional, both operating within the Phase II Sectors, and the push from the older Phase I Sectors caused by congestion and overcrowding, probably resulting in a dispersal of population from the Phase I to Phase II Sectors.

The spatial pattern of growth during 1981-91 is conspicuous because all the Phase I Sectors registered either very low or negative growth rates (Fig.27). In comparison, the Phase II Sectors, particularly numbers 39 to 46, the last to be developed during this Phase and enumerated for the first time in 1981, registered very high growth rates.

On the basis of the growth rates registered by individual Sectors during 1981-91, the following types of areas have been identified (Fig.27):

(i) Areas of Very High Growth (More than 320 per cent)
(ii) Areas of High Growth (38.72 to 320 per cent)
(iii) Areas of Low Growth (11.93 to 38.72 per cent)
(iv) Areas of Very Low Growth (Less than 11.93 per cent)

(i) Areas of Very High Growth (More than 320 per cent)

This category comprises the newly developed Phase II Sectors, 42, 41,46,44,45,43 and 39 in the same order. Locationally, these Sectors lie on the extreme southern margin of the city (Fig.27). These were enumerated for the first time in 1981. The growth rate among these varied between 11453.20 per cent in Sector 42 to 321.01 per cent in Sector 39. Sector 42 registered the highest growth rate in the city and in this category. It includes the Census Town of Attawa, an upgradation of the village settlement of the same name. In 1981, this Sector had a population of 17 persons which increased to 1,733 persons in 1991. This Sector has been developed with government as well as private housing, predominantly in the form of flats and small individual plots. This Sector also has a number of institutions, namely an undergraduate college, a sports complex, and the Hotel Management and Food Craft Institute. A large part of the Sector is to be developed as an extension of the Leisure Valley that runs through the city as a green belt. In totality, about half of the total area of this Sector comprises of institutional and recreational uses and the other half of housing and associated landuses. Considering
that only about 50 per cent of the total area of this Sector is proposed to be developed for residential use, it is an area of very high crowding.

Sector 41 contains two Outgrowths, Buterla and Badheri, developed around village settlements of the same name. This, along with the generally small size of public housing plots, are major contributing factors to the very high growth rate (9510.20 per cent) registered by this Sector during 1981-91. Though Sector 41 was enumerated for the first time in 1981 as having a population of only 237 persons, it emerged as the only Phase II Sector with a population in excess of its planned target (12,000 persons) in 1991. Sector 46 is also dominated by public housing for the employees of the Central Government, Chandigarh Union Territory, the PWD and Police Departments. The plot sizes, whether public or private, are predominantly small. Sector 44 has cooperative institutional housing, for example the Army Welfare Society and the RBI. There are also HIG and LIG flats constructed by the Housing Board. Sector 45 is also mainly a public housing Sector. However, the location of Burail Census Town, which has grown around a village settlement of the same name, is a more important factor contributing to the very high growth rate of this Sector. Only half of Sector 43 has been allocated for residential landuse, the rest being reserved for the development of a city sub-centre and the second Inter-State Bus Terminus. The housing, mainly public, is generally in the form of flats and small sized plots.

Sector 39 registered the lowest growth rate in this category (321.01 per cent). About a quarter of this Sector is occupied by the Institute of Microbial Technology and its campus. The government housing, intended for the UT employees, comprises of small sized plots. The private housing, too, is developed on small plots, leading to a concentration of population. However, this Sector is yet to emerge as an area of high intensity. Its population increased from 452 persons in 1981 to 1,903 persons in 1991.

Even though large areas in the Sectors within this category comprise open or vacant spaces reserved for future development, the intensity of housing is high due to the small plot sizes and vertical development. Further, these Sectors are located close to such work areas as Mohali, the Air Force Base and the Industrial Area Phase II. Specifically, the highest growth rates within this category were registered by Sectors having upgraded village settlements within them (Sectors 41, 42 and 45).
(ii) *Areas of High Growth (From 38.72 to 320 per cent)*

This category comprises of Sectors 40, 38, 32, the Industrial Area, Sectors 47, 36 and 34 in the same order. The growth rate among these varied between 269.35 per cent in Sector 40 and 39.55 per cent in Sector 34. All the Sectors in this category constitute the Second Phase of the city’s development.

Sector 40 was enumerated for the first time in 1981 and is dominated by public housing, specifically EWS and LIG houses. The plot sizes within this high density Sector are comparatively small, and housing, whether public or private, is multi-storied. In 1991, the population (17,334 persons) was just short of its planned population of 20,000 persons. Located to the immediate north of Sector 40 is Sector 38, which registered the second highest population growth in this category (Fig.27). During 1971-81, it had recorded a very high growth rate. Sector 38 has both public and private housing. The former is in the HIG and EWS categories. Its peripheral location, on the south-western margins of the city, has attracted slums and squatter settlements. Planned as a high density Sector, it has obvious locational advantages of being close to major work areas in the Phase I Sectors as well as in proximity to those in Mohali located to its south. Sector 32 is dominated by institutions and associated housing, for example, the Government Medical College and its campus, the Survey of India (SOI) and its campus, housing for the ITBP and the SIB. The Sector also has EWS and private housing.

Sector 47, like Sector 38, has locational advantages with reference to proximity to the Air Force Base, Mohali and the Industrial Area. The housing within this Sector consists of LIG houses, and private housing, particularly that promoted by defence personnel. This Sector had registered a very high growth rate during 1971-81. Large areas within Sector 36 consist of open space, for example portions of the Leisure Valley, the green belt that extends through the city, developed as the Hibiscus and Fragrance Gardens. The housing within this Sector was initially developed as private housing only, and government housing was added later on, particularly the blocks of HIG flats. In comparison, Sector 34 has only private housing. The commercial area in this Sector constitutes the first city sub-centre, with the second sub-centre being planned in Sector 43. This Sector, therefore, now forms an important work area of the city due to the
location of many city level commercial and business establishments and administrative functions.

Thus, except for Sector 40, the other Sectors in this category consist of the earlier developed Phase II Sectors which had recorded very high growth rates during 1971-81. Further, these Sectors also enjoy convenient proximity to new work areas both within the city such as the Medical College, All India Radio and Undergraduate Colleges, and on its peripheries such as Mohali, the Air Force Base and the Industrial Area Phase II. This, and the presence of institutional housing and multistoried HIG, MIG, LIG and EWS housing, has contributed to their high growth of population during 1981-91.

(iii) **Areas of Low Growth (From 11.93 to 38.72 per cent)**

This category comprises of Sectors 37,33,31,24,29 and 2 in order of their growth rates which varied from 37.90 per cent in Sector 37 and 11.93 per cent in Sector 2.

Sector 37, developed with private and EWS housing, had recorded a very high growth rate during 1971-81. It follows the earlier noted trend of a decline in population growth after an initial rapid increase. In comparison, Sectors 3 and 2 were the only two Phase I Sectors which recorded a higher growth rate during this decade (35.91 per cent and 11.93 per cent respectively) as compared to the previous decade (13.76 per cent and minus 10.50 per cent respectively). Both these Sectors were planned as low density, high income Sectors. Within Sector 3, there has been an increase in the number of private and public plots during 1981-91, indicating an infilling of the Sector. In 1991, its population (719 persons) was in excess of the planned target (600 persons). Sector 2 recorded an absolute increase of 63 persons during 1981-91. Sector 33 was planned as a medium density Sector. Initially it developed with only private plots and recorded a very high growth rate during 1971-81. During this decade, government housing, both the lower types and HIG flats, were developed in this Sector. Nevertheless, it follows the earlier identified trend of sluggish growth after an initial rapid increase. Similarly, the growth rate of Sector 31 also declined during this decade as compared to its growth rate during the previous decade. Sector 24 has a mixture of institutional (PGI) and public housing. The latter is mainly for the lower income group. In addition, there are apartments for government officers. Except for the first decade, 1961-71, when it registered a very high
growth rate, this Sector has recorded successively lower rates of population growth. However, in 1991, its population was in excess of the proposed target of 9,500 persons. Sector 29 had registered the highest growth rate in the city during 1961-71 (25768.75 per cent). Since then it, like most of the Phase I Sectors, has registered successively lower rates of growth. This Sector has industrial, EWS and institutional housing.

Thus, all the Sectors in this category, except Sectors 3 and 2, registered sluggish growth rates after an initial rapid increase. Further, again with the exception of the above two high income low density Sectors, the housing facilities in the other Sectors are mainly for the lower income groups.

(iv) **Areas of Very Low Growth (Less than 11.93 per cent)**

This category comprises of Sectors 12, 35, 28, 30, 5 and 25 in order of their rates of growth which varied between 9.43 per cent in Sector 12 and 3.64 per cent in Sector 25. All the Sectors in this category, except Sector 35, were developed during Phase I of the city’s development. Also, within this category, Sectors 12, 30, 5 and 25 registered populations in excess of their planned targets in 1991.

Sector 12 is an institutional Sector, housing the PGI, the Engineering and the Architecture Colleges and their campuses. Despite registering successively declining growth rates, this Sector’s population exceeded the planned target during 1981 as well as 1991. In comparison, in Sector 35, private housing was provided initially and public housing developed later, resulting in a gradual infilling of this Sector. Nevertheless, its growth rate declined considerably during this decade (6.10 per cent) as compared to the very high growth rate (439.06 per cent) recorded by it during 1971-81. This conforms to the general trend of a decelerating growth rate after an initial rapid increase. Sector 28 is characterized by small plot sizes, whether private or for housing the industrial workers. Sector 30 was initially developed with institutional housing (CSIO, RBI). Later, private and EWS housing were also added. In comparison, Sector 5 is a low density high income group Sector, having large sized private and public plots. Both Sectors 30 and 5 conform to the general trend of sluggish growth, despite having populations in excess of the planned targets of 10,900 and 600 persons respectively. In 1991, Sector 25 had some institutional housing for employees of the Panjab University. However, its peripheral location and proximity to work areas proved attractive for the development of slums and
labour colonies (Kumhar Colony, Janta Colony). Therefore, inspite of being only partially developed and registering the lowest growth rate in the city, its 1991 population continued to be in excess of its planned target.

Thus, irrespective of the type of housing available, all the Sectors in this category conform to the trend of decelerating growth rates after an initial rapid increase. However, despite this sluggish growth, as many as four out of six Sectors in this category registered populations in excess of their planned targets in 1991. The Peripheral Areas, comprising Labour, EWS and Milkmen colonies, recorded a fairly high growth rate of 521 per cent due to the inclusion of new areas in 1991.

During this decade, the highest growth rates in Chandigarh were registered by the new Phase II Sectors which were enumerated for the first time in 1981. Their high growth was as much due to Outgrowths and Census Towns located within these Sectors as it was due to the development of housing blocks and the proximity to new work areas both within these Sectors and on their peripheries. In comparison, the earlier developed Phase II Sectors and nine older Phase I Sectors registered comparatively sluggish growth, in conformance with the now familiar trend of decreasing growth after an initial rapid increase.

Areas of Decline

Out of a total of forty-six Sectors in the city, twenty Sectors recorded a decline in their absolute populations during 1981-91 (Fig.27). This decline varied between 89.96 per cent in Sector 26 and 1.28 per cent in Sector 9. All these Sectors belong to Phase I and were the first to be developed and settled in the city. Further, thirteen out of these twenty Sectors had recorded populations in excess of their planned targets during one decade or another since 1961. One (Sector 17) in 1961, 1981 and 1991, one (Sector 4) in 1971 and 1981, four (Sectors 22,23,20,27) in 1971, 1981 and 1991, four in 1981 only (Sectors 21,26,16 and 15) and three (Sectors 7,11,9) in 1981 and 1991. Thus, of these thirteen Sectors, four Sectors had exceeded their planned populations since 1971 and an additional four since 1981. The populations of five Sectors declined after 1981 to be within their planned targets.

On the basis of the rates of decline in these twenty Sectors, four types of areas can be identified (Fig.27):
(i) Areas of Very High Decline (More than 22.00 per cent)

(ii) Areas of High Decline (From 11.90 per cent to 22.00 per cent)

(iii) Areas of Low Decline (From 8.02 per cent to 11.9 per cent)

(iv) Areas of Very Low Decline (Less than 8.02 per cent)

(i) **Areas of Very High Decline (More than 22 per cent)**

This category comprises Sectors 26,1,6,4 and 22. The rate of decline among these varied between 89.96 per cent in Sector 26 and 22.24 per cent in Sector 22. Sector 26 had registered a very high growth rate during 1971-81 and had exceeded its planned population of 2,000 persons by about 16,925 persons in 1991. However, its 1991 population recorded a decline by 17,026 persons and was thus, much below its planned target. This decline may be attributed to the relocation of three Labour Colonies and other unauthorized structures to Sector 26 East and East Extension. As such, Sector 26 consists of only institutions and their campuses, four private schools, two undergraduate colleges, two polytechnics and the Punjab State Institute of Public Administration. In addition, it has markets for wholesale trade in grains and vegetables.

Sectors 1 and 6 are also institutional areas with restricted housing facilities. While Sector 1 has the Capitol Complex, Sector 6 has the two state Governors' residences. Both these Sectors had recorded high growth rates during 1971-81. The decline in their populations during this decade was probably associated with certain administrative changes. Sector 4 was planned as a low density high income group Sector. Along with large private and public plots, flats and hostels for the state legislators have also been developed in this Sector. This Sector has consistently recorded a low growth rate since 1961-71, although its population exceeded the planned target in both 1971 and 1981. In 1991, its population declined to be just within the planned target. Sector 22 was the first Sector in Chandigarh to be settled. Located opposite the City Centre, this Sector also has important commercial and business establishments. Planned as a high density Sector, it has registered a population in excess of its planned target (21,900 persons) since 1971. Its 1991 population (22,230 persons) though in excess of the planned target, recorded a marked decline by 6,354 persons. This may be attributed to the saturation of housing within the Sector and the resultant congestion and over crowding.
Thus, the Sectors which recorded the highest declines in their populations were either areas of restricted housing, or did so due to administrative intervention with regard to the removal of slums and labour colonies. Only Sector 22 showed a decline in its population due to saturation of housing and the consequent probable moving out of households.

(ii) **Areas of High Decline (From 11.9 to 22 per cent)**

This category comprises of Sectors 27, 23, 21, 20 and 7 among which the rate of decline varied between 14.57 per cent in Sector 27 and 11.93 per cent in Sector 7. All the Sectors in this category have exceeded their planned populations at one time or another, three (Sectors 27, 23 and 20) continuously since 1971, Sector 7 since 1981 and Sector 21 in 1981 only. Sectors 27, 23 and 20 were among the earliest developed Sectors. The former two were planned as medium density Sectors (12,355 to 18,532 persons per sq.km), while the latter was proposed to be developed as a high density Sector (more than 18,532 persons per sq.km). These Sectors exceeded their planned population targets, and consequently their planned density levels as well, continuously since 1971. The housing within these Sectors, both private and public, is characterized by small plot sizes. Within each house in these Sectors, despite planning, two to three independent living sets for two to three families were constructed at different floors. In case of government housing, one house was allotted to more than one family, as the number of government houses available was far short of the requirement. Nevertheless, despite recording a decrease in their population ranging between 2,400 to 3,700 persons, due to saturation and the shifting out of population, these Sectors continue to be among the most crowded Sectors in Chandigarh. Sector 21 was developed with private housing. Its 1981 population (15,635 persons) exceeded the proposed target (14,500 persons), but in 1991 it recorded a decline of 1,966 persons to fall within the planned limits. Sector 7, one of the more populous of the northern Sectors, exceeded its planned population (11,000 persons) in 1981 as well as 1991. This Sector has both private and public housing, and within the latter, there is provision for various income categories.

All the Sectors in this category belong to Phase I and follow the earlier noted trend of rapid initial increase followed by sluggish growth and then absolute decline.
Areas of Low Decline (From 8.02 to 11.9 per cent)

Sectors 14, 10, 16, 18 and 15 comprise this category in the same order, registering a decline varying between 11.31 per cent in Sector 14 and 8.02 per cent in Sector 15. Among these five Sectors, the population of two Sectors, numbers 16 and 15, had exceeded their planned populations in 1981. In 1991, however, their populations declined sufficiently to fall within the proposed limits. Incidentally, all the Sectors in this category are located along one of the city’s central axis, Madhya Marg (Fig.27). Sector 14 houses the Panjab University Campus, and has consistently recorded very low growth rates. This Sector never exceeded its planned target, and in 1991 was approximately 4,600 persons short of its target population of 11,700 persons. Sectors 10, 16 and 15, in comparison, have both public- and private housing. During this decade, while the population of Sector 15 declined by a substantial margin, approximately 1500 persons, the decline was only by 500 to 600 persons in Sectors 10 and 16. These three Sectors enjoy advantages of close proximity to important institutional areas, for example, Sectors 11, 12, 14 and 17. However, the decrease in population is suggestive of a migration of residents due to congestion and crowding. Sector 18 was developed with only private housing. It recorded a decline by only 425 persons during 1981-91.

Thus, the Sectors in this category comprise Phase I Sectors, and despite variations in the nature of housing facilities, recorded a decline in their population during this decade.

Areas of Very Low Decline (Less than 8.02 per cent)

This category comprises of Sectors 17, 8, 19, 11 and 9. The rate of decline among these varied between 6.20 per cent in Sector 17 and 1.28 per cent in Sector 9. Sector 17, developed as the city’s Commercial and Business Centre, is an area of restricted housing. Consequently, its growth rates have fluctuated over the past decades. It recorded a population in excess of its planned target of 1,000 persons in 1961, 1981 and 1991. During 1981-91, it registered an absolute decline by 3,094 persons, probably associated with the shifting out of temporary residents. In comparison, Sectors 8 and 9 were developed with predominantly private housing. Sector 8 has never exceeded its planned target of 8200 persons, while Sector 9 had a population in excess of its planned limit of 2,400 persons in both 1981 and 1991. During 1991, the population of Sector 8 declined
by 429 persons and that of Sector 9 by only 34 persons. Sectors 19 and 11, in comparison, have both private and public housing. In addition, Sector 11 has two undergraduate colleges and is in proximity to other institutions in Sectors 10, 12 and 14. Due to its central location, it registered a population in excess of its planned target in both 1981 and 1991. Its population declined by 129 persons during 1981-91. Thus, except for Sector 17, all the Sectors in this category are predominantly residential areas, and they follow the familiar trend of negative growth after registering high growth during the previous decades.

SUMMARY

An important measure of the successful functioning of cities is their growth as a part of the regional urban system that is, \textit{vis a vis} other cities, as regional centres, that is, as nodes commanding a functional region, and as individual cities. A study of these aspects assumes even greater importance in the case of planned towns, which have been established \textit{de novo} within their respective urban systems. The growth of such towns is, in effect, a measure of their success as planning ventures. This chapter describes the growth of Chandigarh on three scales: (i) its place in the urban system of the region of which it is the administrative capital, in terms of the rank size arrangement, (ii) its growth as a node for the immediately surrounding area, and (iii) the intra-city decadal patterns of growth of population since 1961.

In the first census after its inception, Chandigarh was registered as a Class II town, with a population of 89,321 persons, and was ranked sixth among the 184 towns and cities of the pre-Reorganized Punjab. In 1971, Chandigarh emerged as a Class I city with a population of 218,743 persons. Further, its rank improved to the fourth position among the 109 urban centres of the Reorganized Punjab, and it was the largest city among the 66 towns of the newly formed state of Haryana. During 1961-71, the population of Chandigarh recorded a growth rate of 144.89 per cent, making it the fastest growing city in both Haryana and Punjab. The city maintained its fourth rank in Punjab and leading position in the Haryana urban system in 1981. The growth rate of its population declined to 73.56 per cent during 1971-81. However, Chandigarh was the
second fastest and fourth fastest growing city in Punjab and Haryana respectively. In 1991, Chandigarh maintained its fourth position among the 121 urban centres of Punjab, after Ludhiana, Amritsar and Jalandhar. In comparison, in Haryana, Faridabad emerged as the largest city of the state in 1991, relegating Chandigarh to the second position. During 1981-91, although Chandigarh recorded a modest growth rate of 34.47 per cent, it was the fourth fastest growing city in both Punjab and Haryana. Thus, since 1961, Chandigarh has been able to compete quite successfully with the large urban centres in both Punjab and Haryana, as evidenced from its maintenance of a high rank among the towns of both the states.

The above trends identified for Chandigarh also hold true, in a large measure, for Bhubaneswar and Gandhinagar. In 1961, Bhubaneswar was registered as a Class III town (38,211 persons), and ranked sixth among Orissa’s 62 towns. It emerged as a Class I town in 1971, occupying the fourth rank. In 1981, its position improved to second rank with a population of 219,211 persons. By 1991, it had emerged as the largest city in Orissa, displacing Cuttack from its traditional premier position. Further, the city's decadal growth rates (176.07, 107.80 and 87.73 per cent during 1961-71, 1971-81 and 1981-91 respectively) have been consistently the highest in the state. Gandhinagar was enumerated for the first time in 1971 as a Class III town (24,055 persons) and ranked sixty-third among the 216 towns of Gujarat. In 1981, it emerged as a Class II town (62,433 persons) and ranked twenty-eighth among the towns of the state. By 1991, Gandhinagar had improved its position to being the eleventh largest urban place in the state and was a Class I city (121,746 persons). Its growth rates during 1971-81 and 1981-91 (160 and 94.97 per cent respectively) were among the highest in the state.

The planned state capitals were implants in their respective regions, and gradually developed regional linkages with their immediately surrounding areas. Thus, the strengthening of their regional interaction with their umlands forms yet another indicator of the success of their growth. In the early 1960s, Chandigarh’s influence extended over an area of about 282 sq. kms. around it, containing 171 villages and 4 towns. The recency of development of the city, as well as the presence of pre-existing centres such as Kalka, Kharar, Morinda and Kurali exerted a restricting influence on the extent of Chandigarh’s service area. By the 1970s, the growth of the city resulted in an
increase in its zone of influence to an area of 1000 sq. kms., containing 395 villages and 7 towns. This expansion took place through the process of capture of umlands of pre-existing service centres and the establishment of new types of linkages. Commuting and the supply of milk and vegetables formed the strongest links between Chandigarh and its region, while retail sale, agricultural produce, medical and educational services provided comparatively weak links. In order to ensure a balanced regional development, a formal region, the Inter State Chandigarh Region (ISCR), was demarcated in 1982. The ISCR, with the Chandigarh Urban Complex as its core, extends over an area of 2421.3 sq. kms, containing 948 villages and 11 urban centres located in the adjoining region of Punjab and Haryana. The influence of Chandigarh over its city-region is evidenced by such significant changes in demographic, social and economic attributes of the ISCR as improvements in sex ratio, female literacy, and in the provision of urban amenities like water supply, health and education. An efficient transport network and the presence of large markets promoted industrial development in the ISCR, particularly in the towns of Mohali, Kharar, Kurali and Dera Bassi. Within the ISCR, the highest degree of change occurred in the area immediately surrounding Chandigarh, which includes the towns of Mohali, Kharar and Panchkula, and in settlements along the major roads, namely, the Chandigarh-Kalka, Chandigarh-Kharar and Chandigarh-Zirakpur roads. In comparison, due to the rugged and hilly nature of terrain, the eastern, north-eastern and south-eastern peripheries of the Region experienced the least extent of change. Thus, Chandigarh has succeeded in establishing strong regional relationships and functional linkages with its surrounding area.

In comparison to Chandigarh, Bhubaneswar and Gandhinagar have not exerted a strong influence on their surrounding regions. About two decades after its establishment, it was noted that Bhubaneswar 'is behaving like a superimposed structure in its so called catchment area' and its status was overshadowed by the proximity of a stronger centre, Cuttack. Since its establishment, proposals for the identification of a Capital Sub-Region and Urban Complex, consisting of the five fastest growing urban centres of Orissa, including Bhubaneswar, have been mooted. At present, the development of Bhubaneswar and the area in its vicinity is within the purview of the Bhubaneswar Development Authority, established in 1983. The major problem hindering a strong
functional integration of Bhubaneswar with the region surrounding it has been a poor transport connectivity of the city with most of the other towns in the state as well as neighbouring towns in Madhya Pradesh and Bihar states. Gandhinagar is yet to build up a distinct regional identity of its own, having been overshadowed by Ahmadabad, and due to the sluggish pace of its development.

At the individual city level, the intra-city patterns of growth of population are a reflection of the vitality and dynamism of the city, both in terms of its status in the urban hierarchy of the region, and with respect to its interaction with the surrounding region. Chandigarh was planned for a population of five lakh persons. Despite initial fears regarding Chandigarh's viability, the city has grown rapidly, recording a growth of 471.60 per cent during 1961-91. Further, with a population of 510,565 persons in 1991, the city has exceeded its projected size.

During 1961-71, the city recorded a high average growth rate of 144.89 per cent. This was associated with the early stage of settlement of the city. The Reorganization of Punjab in 1966 made the city a triple administrative unit. This resulted in a substantial increase in the number of government employees to be stationed in the city. The population of almost every Sector in the city doubled during this decade. An indication of the rapid increase of the population of the city is evident from the fact that Sectors which registered 100 per cent population growth during 1961-71 could only be placed in the category of low growth. Broadly, the highest rates of growth were registered in the Sectors located on the then southern periphery of the city. These started developing at a comparatively later stage and were planned as high density Sectors with small plot sizes and mixed housing. Sector 29, which was planned to house industrial workers initially, registered the highest rates of growth in the city during this decade. The other Sectors which registered high rates of growth mainly had private housing. The Sectors which were among the first to be developed in Chandigarh (numbers 20,22,23 and 27) registered comparatively lower rates of growth, having exceeded their planned population levels. Three Sectors, numbers 1,6 and 17, recorded a decline in their populations during 1961-71. This was due to their functional character as institutional areas with restricted housing. Low rates of growth were also registered in institutional Sectors, for example, Sector 14 registered a growth of 26.81 per cent, the lowest in the city. A characteristic
feature of the growth of population during this decade was the strong association between
the provision of private housing and high rates of growth in a Sector. In addition, the
presence of government housing, particularly for middle and low ranked employees, also
contributed to high growth rates. In both the cases, the presence of small sized plots,
resulting in a high intensity of population concentration as well as vertical development,
was a major contributing factor.

During 1971-81, the city recorded an absolute increase of 160,817 persons, 50.16
per cent of which was in the Phase I Sectors and 49.84 per cent in the nine newly
developed Phase II Sectors, located on the southern margins of the city. The main factors
influencing the growth of the city during this decade were the development of nine new
Phase II Sectors (numbers 31 to 38 and 47), the establishment of the Second Phase
Industrial Area, and the commencement of house building activity by the Chandigarh
Housing Board (CHB) from 1976 onwards. The houses constructed by the Board are in
the Phase II Sectors and for four income groups (high, middle, low and economically
weaker sections) generally in the form of multistoried blocks of flats, indicating the
greater demand for accommodation and the greater intensity of development envisaged in
the Phase II Sectors. During this decade, two satellite townships, Mohali and Panchkula
also started developing on the peripheries of the city. These were promoted by the Punjab
and Haryana governments respectively. The location of these towns, as also of the
Chandimandir Cantonment, the Air Force Base and the HMT township at Pinjore, within
the original Periphery Control Area, indicated the immense potential of economic
proximity to Chandigarh. The average growth rate of Chandigarh’s population during
this decade was 73.56 per cent. Within the city, the highest rates of growth were
recorded by the nine newly enumerated Phase II Sectors, located on the then southern
periphery of the city. These Sectors initially developed with private houses constructed
on small sized plots. In addition, a number of EWS colonies and transit settlements for
unauthorized labour colonies were also located in these Sectors. In comparison to the
vitality of the Phase II Sectors, a majority of the Phase I Sectors recorded sluggish growth
rates. However, inspite of the sluggish population growth many of these Sectors
exceeded their planned population levels in 1981. This suggests a process of infilling,
expansion and saturation operating in Chandigarh due to the limited expansion of housing
facilities possible within the plan framework. Consequently, during the following
decade, all the Phase I Sectors either registered a very low growth or a decline in
population.

During 1981-91, Chandigarh recorded a modest growth rate of 34.47 per cent.
Further, of the total absolute increase of 130,905 persons, the Phase I Sectors accounted
for 30.3 per cent and the Phase II Sectors for 69.7 per cent. The respective figures for
1971-81 were 50.16 and 49.84 per cent. The higher proportion of increase contributed by
the Phase II Sectors is indicative of a greater concentration of population in these Sectors.
These figures also suggest the influence of new work areas, both within the Phase II
Sectors and on their peripheries, and the role of housing, particularly those developed by
the Chandigarh Housing Board, in promoting a greater concentration of population in the
Phase II Sectors. The emergence of new work areas served as countermagnets to the
earlier developed work and residential areas in the older Sectors. The saturation of
housing facilities in the Phase I Sectors also prompted a trend of dispersal of population
to the newly developed Phase II Sectors. During this decade, the highest growth rates
were registered by eight new Phase II Sectors (numbers 39 to 46), enumerated for the
first time in 1981. Their high growth rates (more than 269.55 per cent), despite large
areas within them being reserved for future development, indicate a high intensity of
housing and construction. In addition, three of these Sectors, numbers 41, 42 and 45,
have upgraded village settlements recognized as Outgrowths and Census Towns. In
comparison, twenty out of the thirty Phase I Sectors registered an absolute decline in their
populations. The Sectors with substantial population decline include those from which
unauthorized settlements had been removed, and institutional Sectors with restricted
housing facilities. Other Sectors registering a decline in population include those with a
high intensity of housing. Despite the decline, most of these Sectors have exceeded their
planned populations during one decade or the other since 1971, and are in fact, among the
most crowded areas in the city.

During this decade, therefore, the growth of population in the city was
characterized by a distinct shift in the areas of high growth to the southern Phase II
Sectors. This was relative to the development of these Sectors, the pull exerted by such
nuclei as Mohali, Industrial Area Phase II and the Air Force Base, the development of
private as well as institutional cooperative housing and a possible push from the congested Phase I Sectors. The association between high rates of growth and private housing on small sized plots can be identified for this decade also. The trend of a rapid population growth followed by decelerating and even declining rates of growth, as exhibited by most of the Phase I Sectors, emerges as a major attribute of the growth of population in Chandigarh at the city as well as the Sector level.

References And Notes


5. Mathematically, the relationship between various sizes of cities takes the form of $Pr = P1/r^q$, where, $q =$ constant; $r =$ rank; $P1$, $Pr =$ population of the largest (1) and rth ranked city. Ahmad, Qazi (1965) *Indian Cities: Characteristics and Correlates*, Research Paper 102, Department of Geography, University of Chicago, p.2, and Stewart, Jr., C.T. (1958) 'The Size and Spacing of Cities', *The Geographical Review*, Vol.48. p.222.

6. 'There exist divergent interpretations of the Rank Size Rule ranging from Zipf's relatively simple unifying or centralizing force to the opinion of Simon and later of Berry and Garrison, that it is the result of the law of Entropy', See Berry, B.J.L. and F.E.Horton (1970): *Geographic Perspectives on Urban Systems*, Prentice-Hall Inc., New Jersey, p.79; Berry B.J.L. and W.Garrison (1958) 'Alternate Explanations of


16. All towns in the states were ranked according to size and the expected populations calculated. The log values of both the actual and expected populations were plotted on a simple graph paper.

   – (1971) Final Population, India, Series 1, Paper 1 of 1972, Registrar General of India;
18. Haryana is marked by a rapid urban growth. Many of its towns, especially those located in the influence zone of Delhi, show a phenomenal rate of growth under the spread effects of the national capital. Further, the rate of urban-ward migration in Haryana is close to the national average. The state also has more urban to urban migrants than rural to urban migrants. National Institute of Urban Affairs (1988) *op.cit.*, p.19, 30 and 37.

19. Orissa has a high urban growth rate due to (i) sizeable intra-state rural to urban migration, (ii) a higher rate of natural growth in both urban and rural areas which intensifies pressure of population in rural areas, causing urbanward migration, and (iii) the emergence of new towns. *ibid*, p.19.


21. *ibid*, p.64.

22. Krishan, G (1963) *op.cit*


24. The Inter State Chandigarh Region (ISCR) was constituted in 1982 at the initiative of the Town and Country Planning Organization, New Delhi in consultation with the Town Planning Departments of Punjab, Haryana and Chandigarh. A formal report was published in 1984.


27. *ibid*, p.43.
28. ibid, p.49.
29. ibid, p.50.
32. Vimal, Bindia (1994) op.cit, pp.52-53.
34. ibid, p.174.
35. ibid, p.176.
36. ibid, p.195.
41. ibid, p.58.