CHAPTER-IX

SUMMARY AND FINDINGS
Though the urbanization and regional development are concomitant yet it is difficult to understand the interrelationship between the size and spatial structure of a region, urban hierarchy and regional development because the city of higher order rank in a region tends to be more outward looking than its region. Urban hierarchy have more effect on regional development while the distribution of the industries among the centres of different size according to their relative economies of scale may cause the strategic significance for regional development. The impact of urbanization is being felt frequently even at great distance from the cities. The most obvious instance of urban impact that occurs in the case of rural area in the path of an expanding city is that their occupancy changes from cultivation to urban employment. The continuously urban surrounded rural area where urban encroachment is not so rapid, land may be utilized for market-gardening, poultry and dairy farming. The town creates an extensive market for rural products. Thus the traditional self sufficiency of the village can be changed by market oriented economy and larger number of people can get employment in the cities in secondary and tertiary sectors, which ultimately increase the income level and living conditions in the region. On the basis of specialization of an urban centre the similar specialization impact can be experienced in the surrounding urban region. The major thrust of the state/central government in India is to slow down the growth of big urban centres (Bombay, Bangalore, Madras, Hyderbad. etc) in order increase the
growth rate of small and medium sized town. It is possible with provision of infrastructural facilities to small towns (Class-III to Class-VI) in order to equip them to act as growth centres for the hinterland around each and every town. For this purpose increased investment is proposed for housing, water supply, transportation and communication facilities, besides education, medical care and recreation. In large urban centres (Class I cities and Metropolitan cities) emphasis will also have to be given in improving the conditions of urban poor, slum dwellers and raising the civic services up to the acceptable level. In large urban centers the highest priority will be given to restrict the growth of population through the variety of measures like granting of incentives to start industries in new urban centres and ban in setting in large cities. This is laid in the industrial policy statement.

The urban way of life is assumed to be a synonymous of the desired quality of life as it enhances the per capita productivity and employment opportunity as well as ensures the basic amenities of life. The urbanization is crucial for accelerating the nation's economic development. Urbanizations yields administrative capacity which inturn facilitates national development. Therefore urbanization tends to be highly correlated with overall economic growth as axiomatic in the region. Some economists are of the opinion that the urbanization in the developing countries is pseudo because the process has not been similar to the one that occurred in advanced countries at comparable stage of industrialization and economic growth. The
growing cities in the western countries are able to absorb the increasing population because the industrial revolution introduced technical improvements which made possible to increase agricultural productivity to allow a segment of rural population to shift to cities. The urbanization process in the third world has neither economic strength of the advanced capitalist nation nor the systematic playing of socialism. It has worst of the other two worlds at least with respect to urban development. **The rapid expansion of cities in developing countries including India put enormous strains on urban services such as housing, transportation, water supply, drainage, sanitation, public and personal health and educational services which ultimately caused the ever growing measure on land resources, consequentlytaxing best brains of politicians, decision makers, environmentalists, ecologist, social scientist, town planners and administrators to provide decent health and enthusiastic environment with proper employment opportunity for urban dwellers. With regard to the role of urbanization in regional development it is made clear that the process of urbanization is not only desirable but essential for generating economic growth and social change in developing countries like India. Urbanization also creates external economics, both spatial and non-spatial, which have cumulative and reinforcing effect on subsequent growth.**

The Karnataka state consists of three major physiographic regions viz., Maidan region, Malnad region and Coastal region. The Maidan region is
divided into northern Maidan region and southern Maidan region where the river Tungabhadra is dividing line while foot hills of Western Ghats are dividing line in the west. The Karnataka state consists of 175 talukas covered under the administration of 27 districts. The Maidan region of Karnataka consists of 125 talukas. The total population of Karnataka as per 2001 census is 52680624. The Maidan region of Karnataka consists of 41850345 population, which being 79.44 per cent of total population of Karnataka. The total geographical area of the Maidan region is 137730 sq. kms, which being 71.6 per cent of the geographical area of the Karnataka. The Maidan region of Karnataka has 73.37 per cent of land under net sown area when compared to its geographical area. It covers 6.61 per cent forest land, 10.03 per cent land not available for cultivation and 9.97 per cent fallow land. The Maidan region of Karnataka has black soil extensively in the northern Maidan region and red soils extensively in the southern Maidan region. The average annual rainfalls in the Maidan region of Karnataka varies between 65 to 95 centimeters. Due to scanty and erratic nature of south west monsoons the several talukas of Maidan region are drought prone. However the talukas of river basins like Tungabhadra, Krishna, Malprabha, Ghataprabha, Bhima, Done, Manjra, Cauvery, Hemavati, Hrangi, Kabini, Suvarnavati, Lakshmamirtha, Simsha and Arkavati have provide irrigation and there by the effect of drought is reduced. The net sown area in the Maidan region of Karnataka is 10082072 hectares (73.37 per cent of total geographical area of Maidan region) out of this 19 per cent (1897292 hectares) is irrigated land.
Karnataka has a large proportion of its population living in urban area i.e., 33.98 per cent (17,919,858), higher than the proportion of India as a whole (27.78 per cent) in 2001. The urban population and urban centres are influenced by physiography, agriculture, drainage and economic activities of the area. There are 237 urban centres in Karnataka, out of these 24 are Class - I urban centres and 5 are Class-VI. The distribution of urban centres and urban population differs from region to region. The Coastal region has an area of 11,328 Sq.km (5.9 per cent) with population of 3,569,945 persons. Out of the total population of the region the urban population is 1,073,734. The Costal region has 21 urban-centres, out of these only 2 are Class - I urban centres in 2001. The Malnad region is Physiographically handicapped region, where it includes mountainous areas of difficult terrain, forested tracts of Uttar Kannada, Shimoga, Dakshina Kannada, Hassan, Chikmaglur, Madikeri and Chamarajnagar districts. In these areas of Malnad region there was hardly any stimulus for urban centres to grow in the context of primitive life and self-contained economy of people. It has an area of 43,447 sq.km (22.6 per cent), with total population of 7,260,334 i.e., 13.78 per cent and with urban population of 1,518,132 (8.27 per cent) in 2001. The total number of urban centres in Malnad region are 44, among these 4 are Class -I urban centers. The study region i.e., Maidan region of Karnataka extends over an area of 137,360 Sq.Km (71.6 per cent). It has total population of 41,850,345; out of (79.44 per cent) which 15,327,992 (36.62 per cent) is urban population. There are 172 Urban centres in the Maidan region of Karnataka where 17 centres
are of Class-I. These Class-I urban centres accommodate 70 per cent of urban population in 2001. The region possesses some unique physical, cultural and economic features, which have had an important bearing on population growth, pace of industrialization and extent of urbanization.

The total population in Maidan region, during 1901 was 9,944,004 and rose to 10,443,596 during 1911. During 1921 the population in Maidan region was 10,333,595 and by 1931 it increased to 17,438,382. This shows an increase from 10.69 per cent to 12.3 per cent. The population of Maidan region increased from 12,838,912 persons in 1941 to 15,405,178 persons in 1951. During the next decade 1961, the total population registered an absolute increase of only 2,029,317 persons against 961,004 persons, in the previous decade. Further the total population growth rate was about 47.60 per cent during 1981-91 decade. In actual terms, there was an addition of 6,563,167 populations (29,555,155 persons in 1981 and 36,118,322 persons in 1991). The total population of the Maidan region during 2001 was 41,850,345 persons, which shows 79.44 percent to the total population of Karnataka.

The Maidan region of Karnataka shares 29.10 per cent of urban population while Costal region shares 2.04 per cent and Malnad region shares 2.88 per cent as per 2001 census. The urban population of the Maidan region during the 1901 was 1,235,753 and it decreased to 1,046,669 in 1911. The main reason for the decline of the urban population in Maidan region was due to the effect of droughts and spread of endemics like plague (1911).
During 1921 to 1931, the urban population rose from 1,115,954 to 1,410,369 with an increase of 20.87 per cent. Whereas in 1941 to 51 decade it increased from 1,872,896 to 2675039 with an increase of 29.98 per cent. The proportion of urban population to total population rose from 33,633,900 in 1961 to 5,663,217 in 1971 recording a rise of nearly 32.25 per cent. During the subsequent decades, development of various industries as well as intensification of commercial activities resulted in a rapid increase in urban population, especially since 1961 in the Maidan region of Karnataka. During the decade between 1981 to 1991, the urban population increased from 8,359,398 persons (1981) to 10,590,736 persons (1991). The increase in the urban population can be attributed to migration from the rural area which is universal. The decadal growth of urban population in Maidan region of Karnataka during the period of 1901-2001 broadly reveals an accelerated trend despite some intermittent fluctuations. The urban population of Maidan region of Karnataka, which was 1,235,753 in 1901 and it increased to 15,328,028 in 2001 with a net increase of 1140 per cent. The percentage of urban population living in various classes of urban centres indicates that the tendency of people in Maidan region is to live in the urban centres of higher categories. It shows that Class-I urban centres account for 62.52 per cent of the urban population in 1981 being highest per cent and it increased to 69.86 per cent in 2001. The class II urban centres account for 5.20 per cent during 1981 while 13.29 per cent of urban centres during 2001,
accommodating 9.46 per cent of urban population in 1981 and 9.27 per cent in 2001. The urban population has also shown concentration in the urban centres of class-III, in 1981 and 2001 where the percentage of urban population was only 16.06 per cent in 1981, and was almost same (i.e., 16.30 per cent) in 2001 also. The Class-IV urban centres have registered decreasing trend in their percentage of urban population and percentage of urban centres. The urban centres of class IV in the Maidan region Karnataka were 43.93 per cent in 1981 and 21.97 per cent in 2001. These urban centres constitute only 11.05 per cent in 1981 and 4 per cent of urban population in 2001. The Class-V urban centres have registered decreasing trend in the percentage of urban centres where they have declined from 13.29 per cent to 5.78 per cent during 1981 and 2001 respectively. These urban centres captured 0.73 per cent of the total urban population in 1981 and 0.50 per cent in 2001. About 0.13 per cent and 0.06 per cent of urban population was concentrated in 1981 and 2001, respectively. In case of class VI urban centres we notice 4.62 per cent of urban centre in 1981 and 0.58 per cent in 2001. Out of 52680624 of total population of Karnataka 17919858 (34 per cent) is urban population distributed in 237 urban centres. The Maidan region of Karnataka consists of 41850345 of total population of which 36.67 per cent (15327992) is urban population distributed in 172 urban centres. The Malnad region of Karnataka having 22.6 per cent of total geographical area of Karnataka contains 13.78 per cent of total population of Karnataka. The Malnad region of
Karnataka shares 8.47 per cent of total urban population of Karnataka which is distributed in 44 urban centres. The Coastal region shares 6.78 per cent (3569945 population) of total population while 6 per cent of urban population, distributed in 22 urban centres.

The pattern of Spatial Distribution of urban centres is determined by various micro-geographical conditions such as, site situation, road-railway connectivity and other facilities. This study is made by using nearest neighbour method. This study is carried out for 2001. The Rn value of distribution of urban centres of Karnataka state as whole by the 2001 was 1.25, which shows approaching uniform pattern. This signifies the even distribution of modes of transportation, service centres, market facilities and interlinking characteristics of urban centres on surrounding area or catchments area of respective urban centres. Considering the other facilities like education, medical and distribution of goods and services, market centres and administrative centres, one can say that these have influenced in the making of pattern of distribution of urban centres as that of "approaching uniform pattern". The coastal region and Malnad region of Karnataka are hilly parts of the state and have restricted the people in their free movement from one place to another. On the contrary Northern Maidan region and Southern Maidan region of the state have adequate facilities of transport and have developed in agriculture. In Maidan region of Karnataka the Rn valve shows 1.28 during 2001, which reveals "approaching uniform pattern" of
distribution of urban centres. The horizontal expansion of the urban centres takes place due to development of transportation and communications i.e., railway and roads radiating from the service areas and within the urban boundary. With the construction and upswing of road and railway in the surrounding service areas, the growth of urban centres and industry expands. Consequently the original external form is distorted with new additions in certain directions. A good example is Pune-Banglore National Highway No.4 and Sholapur-Chitradurga National Highway No.13 where the ribbon type of urban centres and settlements along the road and railway are developed. Belgaum, Hubli-Dharwad, Haveri, Ranebennur, Harihar-Davangere, Chitradurga, Ariskere, Sira, Tumkar, Bangalore and Kolar have greatly influenced on the increase of urban population by in migration as well as natural birth and consequently the urban centres show complex nature of urban functions.

Due to paucity of census data of all the urban centres for their occupational structure for the census period of 2001, has made this study as incomplete. However an attempt is made to know the occupational structure of urban centres of Maidan region of Karnataka, in an indirect way by taking the talukawise data on Primary, Secondary and Tertiary activities, where it is almost true that the secondary and tertiary occupations are existing in the urban centres of each taluka, in a concentrated manner, while they may also be existing in rural areas of each taluka in a very negligible percentage.
Such occupational data of the talukas of entire Karnataka (being 175 talukas) are plotted in triangular graph (as per census 2001) (Vide fig.). The Triangular graph shows that nearly 134 talukas of Karnataka have dominance in Primary occupations which range between, 50 per cent to 78 per cent. Therefore the urban centres belonging to these talukas also are not dominant in Secondary and Tertiary activities. This situation is also true in case of Maidan region of Karnataka. There are 3 taluka Viz., Belthagandy Suliya and Puttur of Dakshin Kannada district showing more than 70 per cent of working population in Tertiary sector. These talukas headquarters being urban centres of Class III, IV and V show functional nature as a service centres. There are 3 talukas namely Belgaum (62 per cent), Bhadravati (61 per cent) and Banglore South (51 per cent) where working population is dominantly engaged in Secondary activities. In case of Belgaum taluka the aluminum industry, engineering industry, sari manufacturing industry and several household industries are located in the city of Belgaum, making the Belgaum city as dominant in industrial function. In case of Bhadravati taluka the location of iron and steel industry and paper industry at Bhadravati city and its ancillary industries are dominant to identify Bhadravati urban centre as leading in secondary function. In case of Banglore-South taluka the location of different types of engineering and varieties of small industries make the city of Banglore and its Southern postion as dominant in secondary function.
The rank size distribution of urban centres in the Maiden region of Karnataka when plotted on double log scale graph clearly indicates that the actual population of first ranking city i.e., Bangalore is larger than expected population, when compared from bottom most town (172\textsuperscript{nd}) to primate city: Bangalore. Similarly when calculated from top most i.e., primate city of Bangalore to 172\textsuperscript{nd} town (Adityapattan of Tumkur district) the 2\textsuperscript{nd} ranked city of Maiden region of Karnataka i.e., Hubli-Dharwad could have been a population of 2843422, but in reality it is far less (786018 population). Similarly the 172\textsuperscript{nd} ranked town of class VI order i.e. Adityapattan (of Tumkur District) could have shown an urban population of 33063, which at present has population of 4236 which being far less than the rank size rule. Therefore the principles of rank size rule are not found practically suitable in the Maiden region of Karnataka. The general density of population in Karnataka as whole is 275 persons per sq.km, 304 persons per sq.km in Maiden region of Karnataka, 167 persons per sq. km. in Malnad region of Karnataka and 315 persons per sq. km in Coastal Karnataka. Out of 175 talukas of entire Karnataka 12 talukas show more than 500 persons density per sq. km which includes the talukas like Mangalore, Udupi, Shimoga, Soraba, Tirthahalli, Bangalore-north, Banglore-south, Belgaum, Channagiri, Davangere, Malavali and Mysore. There are 20 talukas where population density is in the range of 350 to 499 persons. There are 102 talukas where density of population is 150 to 349 persons per sq. km. There are 41 talukas
where population density is less than 149 persons per sq. km. A study of demographic development based on 8 indicators reveals that there are 18 talukas identified as extremely high developed in Maidan region of Karnataka. We notice 5 talukas under very high level of development of demographic aspects, 11 talukas under high level of demographic development, 17 talukas under Medium level of demographic development, 17 talukas under low level of demographic development and 15 talukas under very low level of demographic development. We notice about 41 talukas under extremely low level of demographic development. The study of intercorrelation matrix of 8 demographic developments indicators show that in Maidan region of Karnataka 5 indicators viz, $X_2$ growth of population, $X_3$ sex ratio, $X_4$ percentage literate, $X_5$ percentage of urban literates and $X_6$ percentage female literates show positive correlation with $X_1$ density of total population. However two indicators i.e. $X_7$ percentage of main working population and $X_8$ percentage of marginal working population show negative correlation with density of population.

**Karl Pearson’s method of correlation shows a positive significant correlation between demographic development and the level of urbanization in Maidan region of Karnataka as well as in entire Karnataka.** The levels of agricultural development is studied by considering 12 indicators, the results of which show 19 talukas as extremely high developed viz, Badami, Bagalkot, jamkhandi, Mudhol, Baelgaum, Raibag,
Ramdurg, Saundatti, Bijapur, Honnalli, Afzalpur, Aland, Gulbarga, Shorapur, Holenarsipur, Chikanayakanhalli, Gubbi, Tumkur and Turvekere. The very high developed group includes 11 talukas, medium developed category includes 11 talukas, low developed category includes 41 talukas, very low developed category includes 32 talukas and extremely low developed category includes 32 talukas of Maidan region in Karnataka.

It was hypothesized that the agriculture development may not have glaring impact on the levels of urbanization in Maidan region of Karnataka. This hypothesis is proved and result show that the levels of agricultural development have no correlation with levels of urbanization. The intercorrelation matrix of 12 indicators of levels of agricultural development of Maidan region of Karnataka show positive correlation, the 4 indictors viz. $X_5$ number of agricultural implements per 1000 hectares of net shown area, $X_8$ percentage of cultivators to total main workers, $X_{10}$ number of agricultural co-operative societies and $X_{12}$ percentage of rural population with that of $X_1$ (i.e. percentage of net sown area). In the Maidan region of Karnataka the Belgaum and Gulburga talukas appear as extremely high developed in the levels of agricultural development as well as degree of urbanization. This shows that the spatial development is taking place in these talukas.

The levels of infrastructural development with 13 indicators revels that they have positive correlation with urbanization as well as regional
development. The study of levels of infrastructural development in Maidan region of Karnataka shows that the region has 16 talukas as extremely high developed viz., Bangalore North, Bangalore South, Anekal, Athani, Bailhongal, Belgaum, Chikodi, Gokak, Hukkeri, Ramdurga, Bijapur, Davanagere, Dharwad, Hubli, Mysore and T. Narasipur. There are 2 talukas viz. Raibag and Bangarpet as very high developed in infrastructure, 8 talukas under high development, 5 talukas under medium development, 37 talukas under low development, 65 talukas under very low development and no taluka under extremely low development of infrastructure. It is hypothesized that the development of infrastructural in the talukas of Maidan region of Karnataka will have supporting role in the increase of urbanization as well as regional development. This hypothesis is proved.

The levels of industrial development in Maidan region of Karnataka is studied by considering 7 indicators supporting to industrial growth. The result shows that 4 talukas viz. Anekal, Bangalore North, Bangalore South and Mysore as extremely high developed. Two talukas viz. Belgaum and Hubli as very high developed. One taluka i.e. Tumkur shows high level of industrial development and 7 talukas viz. Dodaballapur, Hoskote, Nelamangal, Davangere, Dharwad, Gadag, and Bangarpet as medium developed. There are 104 talukas in Maidan region of Karnataka appearing as low developed, 7 talukas as very low developed in the industrial development. It was hypothesized that the talukas which have been
developed in the industrial aspects shall also have development in urbanization as well as regional development. This hypothesis is partly proved because the talukas which are noticed in the low level of industrial development category are not able to show development in urbanization as well as regional development.

The study of regional development of Maidan region of Karnataka as well as entire Karnataka is attempted with total of 46 indicators belonging to levels of urbanization (6 indicators), levels of demographic development (8 indicators), levels of agricultural development (12 indicators), levels of infrastructural development (12 indicators) and levels of industrial development (7 indicators). Thus levels of regional development in Maidan region of Karnataka are the reflections of composite impact of all the above said 46 indicators. This study reveals 7 talukas as extremely high developed viz. Bangalore North, Bangalore South, Belgaum, Davangere, Hubli, Holenarsipur and Mysore. There are nine talukas that show very high level of regional development viz, Dharwad, Badami, Biligi, Anekal, Chikodi, Gokak, Raibag, Saundatti and Tumkur talukas. There are another 7 talukas under high level of regional development viz. Jamkhandi, Athani, Bailhongal, Hukkeri, T.Narasipur, Chikanayakanhalli and Gubbi under medium development. About 16 talukas are noticed under high level of regional development viz., Bagalkot, Mudhol, Hoskote, Nelamangala, H.B. Halli, Hoskote, Sandur, Afzalpur, Aland Gulbarga, Shorapur,
Channarayapattan, Bangarpet Madhugiri, Sira and Turvekere. There are 24 talukas appearing as low developed in the level of regional development, 42 talukas in very low development and 20 talukas as extremely low developed. The results of correlation matrix between regional development and levels of urbanization reveal significantly positive (0.98) correlation. Between regional development and levels of demographic development the correlation value shows (0.28) positive insignificantly correlation, Between regional development and agricultural development (-0.10) negative correlation is noticed. Between regional development and levels of infrastructural development the correlation value shows (0.51) positive correlation. Between regional development and levels of industrial development the negative (-0.26) correlation is observed.

We notice positive correlation between levels of urbanization and levels of demographic development (0.26). There is significant positive correlation (0.94) between levels of urbanization and levels of agricultural development. This fact is of an interest in understanding the nature of urbanization in Karnataka where the talukas of district of Belgaum have shown high development in agricultural aspects (having highest irrigated land, having higher number of agricultural implements, highest land under net sown area more then once) leading to the formation of 18 urban centres. Similarly the talukas having higher extent of irrigation in the Maidan region of Karnataka especially the Tungabhadra canal irrigated talukas like
Gangavati, Kampli, Hospet, Raichur, Shindhanur and KRS canal irrigated taluks of Mysore district Mandya district and irrigated taluks under tributaries of Cauvery river like Channarayapattana, Holenarasipur also show increased number of urban centres. The similar situation is also emerging in Krishna basin of Bijapur district and Bagalkot district. The correlation between levels of urbanization with that of levels of infrastructure is positive correlation (0.94) which is quite natural.

The correlation between levels of urbanization and levels of industrial development shows negative correlation (-0.26). Therefore the towns of Maidan region of Karnataka and also the other towns of other two regions of Karnataka are not having industrial base to stimulate the growth of secondary towns, except Bhadravati town and a few towns in Mangalore district.

The identification of different levels development made in the chapter like urbanization, demographic development, agricultural development, infrastructural development, industrial development and regional development are to be taken as research findings of this thesis. The analysis of intercorrelation matrix made in the above said chapters also give us enough clues for making appropriate development of such factors in spatial (talukawise) frame work. Due to non availability of census data interns of various urban functions of the all urban centres, the study of occupational structure of all the urban centres is not taken up, which appears
as limitation of this thesis. Considering the vastness of the Karnataka state and its large number of talukas the temporal analysis of the study is not taken up which is another limitation of the thesis.

However this entire thesis is an outcome of laborious collection of secondary data from census volumes as well as from the various government offices located at Karnataka’s capital Bangalore. It is hoped that the detailed findings in the form of maps, tables and correlation matrix depicted in relevant chapters are sole contributions of this researcher which are brought out by pain taking efforts by applying relevant methods through computer applications and cartographic design. The researcher has spent nearly four years in making this thesis with all its findings at this level. It is hoped that the identification of levels of development of various aspects and levels of urbanization and levels of regional development will add as contributive research literature in the field of geography as an authentic findings of this researcher. It is needles to say that plans and programmes are needed to develop backward talukas in order to upgrade the levels of regional development and there by to fore-see urban development and vis-a-vis regional development of Maindan region of Karnataka.