CHAPTER-VII
SUMMARY AND CONCLUSION
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7.1 Summary

Chapter 1

- It is seen that the influence of the city is spreading in the rural areas and changing their physical landscape, economic and social environment. Thus, an attempt is made in the present study, to examine and analyse the cumulative effects of the city-region relationship and identify the pattern demographic, social and economic characteristics.

- The Haridwar Development Region is taken up in the present study. The region was formulated in 1986 to have an overall development of the region. The region has its great significance as it include two most important cities of new state of Uttaranchal.

- It is observed from the review of literature that despite a long tradition of geographical research in rural urban migration, there has been dearth of material published on wider interactions and linkages between urban and rural areas. Beside, a bulk of research has been devoted to the analysis of urban and rural development as separate issues. By focusing on separate urban and rural themes, attention has been drawn away from the connections between these two foci of change. Increasingly it is now being argued that urban and rural change could be seen, not as process in themselves, but as the product of deeper structural transformations in society. By concentrating on the linkages and flows between town and the surrounding rural settlements a more comprehensive grasp of the processes of social and economic change effecting the rural can be achieved.

- Urban and rural change, therefore, need to be seen as parts of an overall social formation, and one way in which this can be achieved is through an analysis of the interactions between these two foci of change.

- Against this backdrop, the focus of the present study is to examine the pattern of rural urban interaction and the impact of this interaction on the land use pattern and on the demographic, social and economic characteristics of rural settlements in the region.
The study of the land use pattern and functional structure of the Haridwar Development Region with emphasis on land use pattern, demographic, social and economic characteristics and their change over time is an important aspect. It is also necessary, to analyse the growth of the city and its region in a spatio-temporal framework and assess the complex processes at work. The study has made an attempt to identify the changes in demographic, socio-economic characteristics in the surrounding rural settlements and changes in the general land use pattern in these settlements before and after the formation of HDR. The interaction pattern of the settlements in terms of commutation of the inhabitants to the city and other neighbouring areas for various goods and services is also studied in detail to analyse the relationship that exists among the settlements in general and with the Haridwar City in particular.

The study of pattern of interaction of these rural settlements with the city gives us the clear understanding of the role of the city on the overall development of the region and presence of gaps. It also helps us to identify the growth centres so that they can be developed for further balanced development of the region.

Taking into consideration the above observations, the present study is based on the following objectives- to examine the spatio-temporal trends in the demographic and socio-economic characteristics of rural settlements of the region; to examine the spatial and temporal changes in land use pattern and identify rate of change; to study the pattern of interaction among settlements and also examine the degree of interaction of settlements with Haridwar City: to examine the changes in the land use and cropping pattern of the villages: and Finally to analyse the changes in demographic, social and economic characteristics in the rural settlements and quality of life of people based on their degree of interaction with the city.

The present research utilises data from both primary and secondary sources to facilitate the study. The primary data is collected through a comprehensive structured questionnaire prepared at three levels: (a) village level, (b) household level and (c) city level. The sample villages are selected on the basis of distance from the city and the level of infrastructure facilities available in these villages. Proportional random sampling method has been used for the selection of sample households.
• The data collected has been transformed into variables and indicators suitable for the study. Various quantitative, statistical and cartographic methods and techniques are used for data compilation, tabulation, analysis and representation.

Chapter 11

• Haridwar Development Region is surrounded by lesser Himalayas in the north, Shiwaliks in the west and east and plains in the south. It includes the part of Bhabar, Tarai and Indo-Gangetic alluvial plain. Ganga River flows from the hills to the plains in this region. It covers an area of about 659 Sq. Kms.

• Past records show that the region was covered with dense forests. But with the increase in population, the forests have been gradually cleared and reclaimed for both agricultural and residential purposes. Analysis of the data shows that the land use in the rural areas has undergone significant changes since 1971. The area under forest and cultivated land has decreased while area under cultivable wasteland and area not available for cultivation has increased significantly since 1971.

• The total population of Haridwar Development Region in 1971 was 1,68,473 which has increased to 4,12,523 in 2001. The growth rate of total population has experienced decline over the last three decades. It has decreased from 56.6 percent in 1971-81 to 33.7 in 1981-91 and further to as low as 16.93 percent in 1991-2001. The average population density in the region has increased from 714 persons in 1971, to 1745 persons per sq. km in 2001.

• The region has experienced significant increase in literacy (both male & female) levels since 1971. It has increased from 47.65 percent in 1971 to 77.56 percent in 2001.

• The characteristic feature of the workforce structure in the study region shows low participation rates and wide variations in male and female as well as rural and urban work participation rates.

• The percent share of both SC and ST population has shown decline in the region. The SC population has decreased from 16.05 percent in 1971 to 11.39
percent in 2001 in the region. Similarly, the percent of SC population has also decreased from 0.50 in 1971 to 0.10 in 2001.

- The classification of workers in different categories shows that in the rural areas, the share of primary sector has declined significantly and the share of secondary and tertiary sector has increased.

- A large section of the population in the region is directly or indirectly dependent on religious activities. However, contrary to appearances, the two cities are not entirely preoccupied with religion. Haridwar city is a renowned center for the manufacture of herbal Ayurvedic medicines. Precious, rare herbs are gathered in the Himalayas and brought to the wholesale market in Haridwar. Local pharmacies, which vary in size, benefit from this proximity. Similarly, both the cities also act as a principal collecting and distributing business centres for Uttaranchal, especially for Tehri and Pauri-Garhwal districts. All necessary goods like, grains, clothes etc. are channelized from Rishikesh to these districts. Rishikesh is also the starting point of the famous ‘Char Dham Yatra’ in the Himalayas.

- The level of infrastructural facilities shows wide variations over the study area. Settlements having higher level of infrastructure facilities are concentrated along the highway or in close proximity to the city. Settlements having medium level of facilities are located in small clusters in Rishikesh tehsil and also in south-eastern part of the study area. Settlements having low level of infrastructural facilities are located in fragments; one cluster is located in south-western and other in southern part of the region. The inter-relationship of level of infrastructural facilities with population density, total work participation ratio, percent population engaged in agriculture and non-agriculture activities and literacy were determined. It is observed that population density, literacy and percent of population in non-agricultural activities have positive relationship with infrastructure facilities while work participation ratio and percent of population engaged in primary activity show a negative relationship with level of infrastructural facilities in the settlements. All these relationships are significant at 0.01% level of significance.
Chapter III

- Distribution of land under different uses is not uniform in the region. This variation is increasing with the increasing influence of the city in the surrounding rural areas.

- There has been a continuous decline in the forest and cultivated area, while both cultivable wasteland and area not available for cultivation have experienced increase during 1971-2001. Nevertheless, the proportion of agricultural land has been declining over time, and there has been highest negative growth rate in cultivated areas and highest positive growth in the area not available for cultivation near the urban boundary.

- Distance from the city and highway play an important role in deciding the land use of the area. These areas are high value lands, which provide ample transport facilities to the non-agricultural activities and commuting facilities to the working population.

- Percentage of cultivable wasteland has increased in both the decades but has no clear cut pattern of expansion or decline. These areas are in a beginning stage of urbanisation and thus large size of holdings are purchased by the property dealers and kept vacant for speculation purposes. Percentage of area not available for cultivation has increased in the last three decades. This increase is highest near the urban boundary and the highway because of urbanisation activities near the city boundary and commercial activities near the highway.

- The number of holdings has decreased in the study area. This decrease is highest near the urban boundary where land has been sold by the farmers in higher percent due to high prices.

- With decreasing number and size of land holdings, the percent of part-time farmers is also increasing steadily and this process is accelerating the land conversion and leading to increase in non-agriculture activities.

- The urbanisation process in the fringe areas has led to changes in the cropping pattern in the region. The share of cash crops like fruits, vegetables and flowers has shown increase. However, the farmers are more interested in sowing crops that needs relatively less care and supervision which can be
reflected in increase of area under cereals and fruits where the farmers usually lease out the orchards.

- Livestock population in general has decreased since the formation of the region in 1986. Positive growth is, however, seen in the milch producing animals especially in the innermost distance zone; while all the other animals especially draught animals have experienced decline during this period. Highest percent of female and hired labourers/helpers look after the livestock in the inner zone where the males are engaged in other economic activities and in households where the size of landholding is large.

- Haridwar city has grown in linear pattern along the river in north-east to south-west direction on account of physiographic barriers. However, now the city is expanding towards the south and south-western direction along the major transport radials. The land use of Haridwar City has experienced significant change since 1985. The land use under residential, commercial, trade, transport and industries has increased while the area under agriculture, open spaces, play grounds, orchards have experienced continuous decline.

- The Haridwar development authority proposed the land use pattern for the year 2001 keeping in view the future growth of population. The authority's attempt to maintain the area under orchards, play grounds, open spaces and to make an organised truck stand, transport nagar and an inter-state bus stand outside the city has not been successful so far. Moreover, the increase in community facilities and river front development were other proposals mentioned in the plan that are yet to be achieved by the authorities. Similarly, the proposal of an outer ring road engulfing all the proposed urban area is yet to materialise.

Chapter IV

- The spatial pattern of interaction of the settlements in the region is measured on the basis of Zipf's Gravity Model. However, as the level of interaction of settlements based on this portrays only a broad pattern of the interrelationship between settlements as it considers only two factors distance and population. Hence to have further understanding of the pattern and intensity of
interaction of the settlements in the region. The commutation pattern of the rural inhabitants to the city and other settlements for various goods and services has been studied using the primary data collected during the field survey.

- The existing network of the region has developed into a linear form from north-east to south-west direction because of physical constraints, as the region is surrounded by lesser Himalayas in the north and Shiwaliks in the west and east.

- Analysis shows that the Government transport facilities are negligible and private conveyance used by the population are the most important mode of transport for traveling to the city. The cost of travel by private conveyance to the city is cheaper for shorter distance while the public means of transport is more cost effective for longer distances.

- About 40.6 percent households have to travel less than 2 kms to reach the city while about 25.2 percent cover more than 10 kms. About 60 percent of households visit the city at least once a week.

- Dependency of the rural settlements on city for various facilities shows that highest percent (88.70) of households are dependent on city for healthcare services followed by administrative facilities (79.31 percent) and social facilities (38.12 percent). About 38 percent of population commute to the city for work. However, vast inter-zonal and intra-zonal variations are observed.

- The co-efficient of variation is high for lower order goods and services as compared to the co-efficient of variation for higher order goods and services. Similarly, the co-efficient of variation is highest in dependency on city for education facilities, followed by the financial and economic linkages. On the other hand, dependency on the city for healthcare facilities, administrative, social, religious and entertainment services has relatively lower co-efficient of variation.

- Field observations reveal the interdependency and relationship of the inhabitants of the villages with the city for various types of goods and services. These linkages do not occur or operate in isolation. Each types of linkage have a symbiotic relationship and they exist simultaneously.
Accessibility in terms of distance is an important determining factor for intensity of interactions between any two centres especially for lower order goods and services. However, physical factors like condition of roads, availability and frequency of public transport facility, and economic factors like travel cost, inequality and disparities in availability of goods and services, quality and variety of facilities available, affordability and awareness of the population are other important factors determining the level of interaction. These factors are more important in case of higher order goods and services.

Inter-relationship of the intensity of interaction and its determinants shows that the interaction has negative relationship with distance, travel cost, percent population engaged in primary activities and percent area under cultivation while it has positive relationship with sex ratio, percent population in non-agricultural activities and per capita expenditure.

The city is dependent on surrounding villages for a variety of goods and services like food-grain, dairy products, flowers, fruits and vegetables, fodder for animals, building, construction materials etc. It also depends on the surrounding areas for raw materials and intermediary products for industries, finished goods of cottage industries in the villages and other consumable items.

Many activities which are not conducive in urban environment or needs more space are located in rural areas. The surrounding rural region also provides labour (skilled and unskilled) to the city in various sectors. Most of the labourers come from the villages located adjacent to the urban boundary and along the highways. Various education institutes are shifting from the congested area of the city to the surrounding rural region. The surrounding rural area also serves as dumping ground for solid and liquid waste disposal of the city. In some villages the facilities like godowns, warehouses, working units and small scale industries are coming up. Many residential colonies have also come up in villages adjacent to the city.

Chapter V

The process of urbanisation started soon after independence and gained momentum since 1971 and after the establishment of industries. The region
experienced heavy influx of population during partition in 1947 and later after the establishment of the industries. The region also received migrants from hills especially from Pauri and Tehri districts who moved to plains for better living conditions and employment opportunities.

- As the population of Haridwar and Rishikesh cities has increased tremendously in recent years, these cities have started over spilling in the surrounding rural areas and hence the areas adjacent to these cities have experienced tremendous growth of population. With the process of uncontrolled, unregulated and unplanned growth, various mixed type of land uses have developed in these villages.

- The population of the region has shown four to five fold increase during 1971-2001; the rate of growth of population is highest during 1981-91 followed by in 1991-2001. The rate of growth has been highest in the inner zone.

- Migration in the region has been a continuous process since independence, however, the highest migration in the region is observed after the formation of HDR and more recently the Uttaranchal state. Maximum migrants are from Uttaranchal followed by Uttar Pradesh. Highest percent of migrants have migrated on account of economic reasons.

- Majority of commercial establishments in the region are shops (88.56 percent), followed by small scale household industries and manufacturing units (9.57 percent). The industrial establishments show decreasing trend with increase in the distance from the urban boundary and major roads. About, 76.8 percent establishment owners reside within the village at the location of their establishments. Residence of establishment owners within the village nearness to the city-market, cheap rent and provision of government facilities to promote commercial establishments are the important reasons for locating the establishment in the region.

- Both land sale and the land prices have shown exorbitant increase recently. The increasing demand of land and the resultant increase in prices has lured the farmers to sell their land in open market which has given rise to large scale land speculators in the region. This phenomenon is more evident and clear in the inner zone. Highest land sale is done through speculators followed by the
government and direct sale by the farmers to the buyers. The direct sale from farmer to the buyer is more popular in the middle and outer zone.

- The work force participation ratio to the total population has declined in 2001 as compared to 1991. However, the percent share of marginal workers has shown significant increase in both rural and urban areas during this period. The rural and urban percent of workers in these three major sectors show that in the rural areas the share of primary sector has declined significantly and the share of secondary and tertiary sector has increased. In the urban areas, the share of secondary and tertiary sector is higher in both the decades as compared to primary sector. The percent workers in tertiary sector are highest in 1971, but its percentage has declined in 1991. In the classification of workers in nine industrial categories, the percent share of cultivators and agricultural labourers has declined while that of livestock and mining and quarrying has increased during 1971-1991.

- In the secondary sector, the percent of workers in the household industry has decreased both in rural and urban areas while, on the other hand, the workers engaged in manufacturing and construction industry has shown an increase in both the areas. The share of workers engaged in all the three sub-categories of tertiary sector shows an interesting pattern, the percent of workers have shown decline in the urban areas while the share of workers show an increasing trend in the rural areas.

- The rural-urban comparison in the growth of workers shows that the rural areas have experienced highest growth in secondary sector followed by the tertiary sector. Zone-wise analysis shows that the inner zone has highest percentage (67.17) of workers engaged in tertiary sector followed by the outer zone, while the middle zone has comparatively lower levels (51 percent) of workers in tertiary sector.

- The percent of workers in the secondary sector are highest in the inner zone followed by the middle zone. The highest percent of secondary sector workers in the inner and middle zone shows that the concentration of industrial activities are mainly around city or along the major roads. The highest percent of workers in the primary sector are in the middle zone, followed by the outer zone.
• Percent of workers having livestock care as their main occupation is highest in inner zone, followed by the outer zone. In the micro level classification of workers, the occupation class of unskilled factory workers has the highest share to the total workers. The middle zone has the highest percent of such workers, followed by the inner zone. The occupation class of skilled workers is the second highest occupation group under the secondary sector and the inner zone has highest percent of workers under this class.

• Significant percent of main workers have supplementary occupation along with their main occupations. Significant percent (37 percent) of heads of the households have changed their occupation in the last 20 years. The head of households of the settlements in the inner zone have experienced highest percent of change in their occupation. Among the farmers, majority of households have changed their occupation because of division of land, sale of land in the open market or acquisition by the government and also because of their interest in non-agricultural activities. Among the non-farming and migrant population, better employment opportunity is the main reason for shifting from their previous occupation.

• In regard to diversification of occupation, the inner zone has experienced higher level of diversification while the settlements of the outer zone the lowest.

• In the expenditure wise classification, highest percent of households in the lowest expenditure class (i.e. Rs.500/- and less per capita expenditure) are from the outer zone, while the inner zone has lowest percentage of household in this class. The percent of households in various expenditure classes show that the expenditure varies with the diversification of occupation structure. It is observed that the percent of population engaged in non-farming activities like DWL, unskilled factory workers, other unskilled workers have a lower per capita expenditure than the population engaged in services, self employed, shop owners etc.

• The expenditure is highest among the farming class while it is lowest among the non-farming class. Item-wise analysis shows that the highest expenditure among the households is on ration, vegetable, fruits, milk and milk products. The lowest per capita expenditure is on health in all the three zones of the
region. Per capita expenditure further shows that, the expenditure on education, conveyance, agriculture and allied activities like agricultural input, cattle feeds etc. have higher co-efficient of variation in all the three zones, while expenditure on items like ration, vegetables, fruits, milk & milk products and animal products has lower variation.

- Zone-wise, the inner zone has comparatively higher percent of population having high and very high quality of life, while the middle zone has lowest.
- Factors like increased interaction with the city, occupational diversification and increase in economic status has made education facilities available for the population of rural areas in the region. The combined impact of all the above mentioned factors has also led to an increase in the literacy and education level of the region. Literacy has increased significantly since 1971. The field observations show that 34.28 percent of population of the region is attending various education institutions. Significant percent of population in the age group of 4 to 7 years is attending schools including anganwadis.

Chapter VI

- Study shows that there is a shift from kutch to semi-pucca and pucca houses in the region. Even the style of housing has changed where people spend money for designing their houses. This phenomenon is more prevalent in the inner zone. The inner zone has higher percent of multi storey houses, majority of which have been constructed recently.
- The percent of exclusively residential houses is highest in the inner zone while the middle and outer zones have livestock or commercial activities going all along within the residential premises.
- The percent of rental houses decreases towards outer zone. Analysis of the structure of houses in the region shows that the quality, style and design of the houses is very modern and urban in the inner zone and becomes more rural and traditional towards the outer zone.
- The highest percent of households live in 2 to 3 room accommodation, however, the inner zone has highest percent of households with one room accommodation and its percent decreases towards the outer zone.
• Analysis of the availability of household amenities show that the percentage of households using LPG for cooking is highest among the inner zone, while middle zone has highest percent of households using conventional sources like wood and cow dung.

• The highest percent of population use water from hand pump for drinking in the region, while tap water forms the second most important source. About 97.5 percent of households have electricity connections in the region, however, the middle zone has highest percent of households with unauthorised tapping of electricity and the inner zone has lowest percent of such households.

• Percent of households having closed bathrooms and toilets is highest in the inner zone while the middle zone has lowest percent. Similarly, the inner zone has highest percent of septic tanks for toilets while the middle zone has lowest.

• Analysis of the problems of environmental degradation in the region shows that the inner zone has greatest problem of over crowding; congestion; solid and liquid waste disposal in vacant plots or along roads; over flowing and clogging of drains; dampness and foul smell. The inner zone has also severe problem of encroachment on roads sides and public open spaces. These problems show decline towards the outer zone where the density of population and urban activities is relatively lower.

• About 80 percent farmers in the region prefer to sell their land in the open market. Among the factors determining the sale of land to different agencies high price (60.45 percent) is the most important factor followed by hidden payment (14.93), retention of part of land (14.93 percent), direct payments (9.60 percent). Regarding measures to save agricultural land, the highest (32 percent) percent of respondents are of the view that only barren land should be utilised for non-agricultural activities. Increase in land sale, problem of wild animals, lack of irrigation facilities, reduction in size of land holdings, high risk factor involved in agriculture and scarcity of labour are the important problems faced by the farmers in the region. About 59 percent of respondents feel that the land sale has positives effects on the landless: similarly 46 percent of respondents are of the view that the increase in industrial and commercial activities in the region has a benefited the rural population. Around 55 percent
of respondents feel that migrants have close relations with the local population. This percent of opinion is highest in the inner zone followed by outer and middle zone. 52.35 percent of respondents feel that the migrants do play an important role while 46.65 percent feel that the migrants have negligible role in transforming or affecting the culture of the village.

- Regarding the conflicts between the population from the hills and the plains, 51.1 percent of respondent feel that wide social difference between the populations from these regions is the main reason of conflict. About, 57 percent of respondents are of the view that the migrants have adverse effects (deterioration of the strong social relations and Infiltration of anti-social elements) on the village society.

- Long distance, lack of public transport facilities, its unsatisfactory frequency, bad condition of road, high travel cost are the major factors affecting accessibility to the city.

- About 52 percent of respondents feel that the floating population visiting the city has positive effect (employment generation, infrastructural development, etc) on the rural population while 29 percent feel that it has negative impact in terms of traffic problems, rise in prices of some commodities and growth in anti-social activities.

7.2 Conclusions

- It is observed that distance from the city and highway play an important role in deciding the land use of the area.

- There has been a continuous decline in the forest and cultivated area, while both cultivable wasteland and area not available for cultivation have experienced increase in their percentage during 1971-2001. Nevertheless the proportion of agricultural land has been declining over time, and there has been highest negative growth in cultivated areas and highest positive growth in the area not available for cultivation near the urban boundary and along the highways.

- Field investigations confirm that there is relatively high intensity of non-agricultural activities in areas adjacent to the urban boundary and in the vicinity of the highway. These are high value lands, which provide better
transport facilities to the non-agricultural activities and commuting facilities to the working population.

- Land use in the region is diversified which is evident from the fact that percent of area not available for cultivation which is generally occupied by non agricultural activities (residential, commercial, industrial etc.) is significantly higher near to the urban boundary and along the major transport radials. Its percentage is reduced with the increase in distance from the urban boundary and highway. Moreover, the area available for cultivation shows negative relation with the distance from the urban boundary.

- **These results prove the hypothesis that the land under non-agricultural uses shows a positive relationship with distance from the urban boundary and major roads; and there exists a gradient pattern i.e., as the distance from the city increases the land under non-agricultural use decreases.**

- Studying the percent area under each land use during 1971-2001 shows that the conversion of land from agricultural to non agricultural uses is higher near the urban boundary and along the major transport radials while it is relatively gradual in the interior.

- There has been change in the cropping pattern especially among cereals. Paddy in *Kharif* season and wheat in *Rabi* have experienced rise in percentage area, while maize, bajara, jawar have experienced decline during 1986-87 to 2002-03. The percentage area under vegetables and flowers has also shown increase during this period.

- Analysis of land sale reveals that out of the total sale of agricultural land by the farmers, majority have been sold to the speculators or directly during 1985-2002. Speculators generally keep the land vacant for some time in the hope of rise in prices. Moreover, the land sale does not lead to change in the land use immediately, as the buyers of these unregulated residential plots in the inner zone keep the land vacant either to manage money for construction of houses or wait for the colony to develop fully and hence this land remains vacant for a period of time and is categorised as cultivable wasteland in many cases. **These results show that land conversion follows a steady process from agricultural land to cultivable wasteland and finally to area not available for cultivation.**
• Field observations confirm the existence of both the formal and informal land market system and the prices are generally many fold higher in the informal sale. These land prices are usually higher near the urban boundary and along major transport radials. The percent increase in the informal land prices is more than the increase in formal land prices during 1985-86 to 2002-03.

• With significant changes in the land use and cropping pattern, the occupation structure of the population is also undergoing remarkable changes. The region shows shift of workers from primary to secondary and tertiary sector which clearly shows the changed economic structure in the region. The inner zone which has experienced significant decrease in the cultivated land and increase in area not available for cultivation has shown higher rate of occupational change.

• Process of urbanisation in the region involves the interaction of internal and external forces that have brought changes from a traditional agrarian society to more modern and urbanised form. This is a continuous process that is not only changing the physical landscape, but also the economic and social environment of the neighbouring rural areas surrounding the city.

• The intensity of Rural-Urban Interaction has been increasing with decreasing size of land holding in rural areas and declining share of absorption of labour force in agricultural activities and thus releasing labour for other alternative jobs leading to greater interaction. On the other hand, employment opportunities in the cities attract rural folk for greater scope of employment, income and attraction of modern facilities and urban way of life.

• Distance is one of the most important determining factor of rural-urban interaction. However, other factors also play crucial role in governing the visit of the population to the city. Some of the important factors identified during the field observations are availability of various goods and services within the village, distance to the city, condition of the road, availability of public transport at affordable rates, frequency of public transport, socio-economic status of the rural population and occupation patterns of the households.

• The variables like distance to the city, accessibility in terms of public transport, its availability and frequency along with travel cost are the governing factors for the dependency on the city for lower order goods and
services. While, in case of higher order goods and services, accessibility is only one of the important factors that determines the intensity of interaction. Other factors are occupations of households, standard of living, their awareness regarding the facility etc.

- It is analysed that for lower order goods and services the population traveled to the nearest city while for higher order goods and services, the villagers are willing to travel longer distances (other cities covering more than 100 Kilometers).

- Moreover, the lower order goods and services have greater co-efficient of variation in terms of percent of population dependent on the city as compared to the higher order goods and services.

- An overall interaction index is calculated showing the intensity of interaction of villages with the city based on the order of goods and services and types of linkages. The results show that four villages (Ranipur, Dhalwala, Jagjeetpur and Kangri) have high intensity of interaction with the city. Out of these three villages are located in the inner distance zone and are adjacent to the urban boundary, while Kangri village is located 8 kms. from the city boundary and is in the middle distance zone. Two villages (Ghungtiyani and Jiapota) have medium level of interaction with the city. Both these villages are in the middle zone and are on the major transport lines radiating from the city. Three villages (Bhattowala, Puranpur and Pratitnagar of the outer zone) have low intensity of interaction with the city. These villages are located in the outer distance zone.

- The relationship among the interaction index and its determinants shows that interaction index has negative relation with distance from the city, travel cost or money spent in each trip to the city, percent population engaged in agricultural activities and percent area under cultivation. On the other hand, the level of interaction has positive relation with per capita expenditure and percent population engaged in non-agricultural activities. The settlements having higher interaction with the city have higher percent shift from agriculture to non-agricultural activities and also relatively higher level of occupational diversification. It shows the positive relationship between the
level of interaction and the change in occupation, shift of occupation structure from primary to secondary and tertiary sector and level of diversification.

- Due to increasing linkages with the city, the importance of the traditional shops is declining steadily and other types of commercial establishments of urban nature are coming up which are not directly dependent on or serving the rural settlements where they are located.

- The per capita expenditure does not show positive relation with the distance or the level of interaction; however it shows wide commodity-wise variations among various classes. The farming class has a highest average per capita expenditure while it is lowest among the non-farming class especially the migrant tenants. Commodity-wise average monthly expenditure also shows that per capita expenditure on education and social customs has great variations among three distance zones.

- The region has satisfactory distribution of education facilities. Almost all the settlements have primary school at an average distance of 2 kms and high and secondary schools within 5 kms distance zone. However, the health services available in the region are not satisfactory and the population has to depend on private health care services in the city.

- A significant proportion of population of villages that do not have basic market facilities within the villages depends on villages like Shyampur, Dhalwala and Tapovan near Rishikesh City and Jagjeetpur, Bhardarabad and Shyampur Nuabad around Haridwar city for all types of day-to-day needs as the above mentioned villages have relatively well developed infrastructural facilities.

- The process of urbanisation, interaction and relation with the city and the resultant impact of the city have led to vast changes in the demographic, economic and social characteristics of the population in the surrounding rural areas. Improvement in the income level is reflected in the diversification of occupation structure, education level, household assets, quality of life, housing structure and basic household amenities.

- The nature and structures of houses in the surrounding rural region has also undergone significant changes because of the changes in social and economic environment of the population in the area.
• The living condition in the region has improved in terms of housing and household amenities. There is general shift from *kutcha* to *semi-pucca* and *pucca* houses. Kitchens in the open or living room to separate kitchens with proper ventilation, single storey to multi-storey houses, houses from solely used for personal residence to renting them in part or full, going to the fields and open spaces for defecation to using closed toilets and septic tanks, shift from traditional cooking fuel such as wood and cow dung to cooking gas (LPG). These amenities are enjoyed more by farming class than others and more in the inner zone. It is observed that although the distance from the city and level of interaction play an important role in the availability of these facilities; however other factors like the occupation structure, economic status of population, their education level and awareness are important determining factors in the region. This is on account of the location of all the villages in the region which are within a distance of 16 kilometers from the city and hence the impact of the city is observed in all the villages as majority of households have close relation with the city.

• *It is observed that the per capita expenditure, availability of household assets do not show positive relationship with the level of interaction and hence our hypotheses that housing and household amenities have positive relationship with the level of interaction has proved null and void.*

• The increase in population and density, growth of commercial and industrial establishments, haphazard and unplanned expansion of houses steadily leads to degradation of the rural environment. It is observed that encroachment on roads, haphazard construction, unmanaged solid and liquid waste disposal, foul smell from garbage, overflowing open drains are contributing in deteriorating the environmental quality of the region.

• The study reveals that the farmers are mainly interested in selling their land especially in the informal market as it gives them higher and direct payments by the buyers. They believe that the sale of land has increased their socio-economic status and they are willing to shift their occupation from farming to other self employed occupations which they feel are more respectable and remunerative than cultivation.
• Regarding the growth of industrial and commercial establishments in the region, the people believe that although some of the units are creating pollution but their growth is a sign of development.

• The village community feels that the migrants have led to significant changes in the social and cultural environment in the village society and are not happy with these developments. The study also finds that there is significant tension brewing among the original resident population of the plains and that of the hills. Several incidents of conflicts were observed during the field survey and majority of the sample households have raised their concern about this upcoming problem.

• Finally to conclude, the Haridwar development region is highly dynamic zone where influence of the two cities is leading to significant changes in the land use pattern, in the demographic, social, economic and physical environment. These unplanned and unregulated changes are taking place at a very rapid rate have shown both positive as well as negative results. However, in order to accelerate the positive effects and depreciate the negative effects, regular planning and its continuous monitoring is very important to handle the development activities. On the basis of the present study, following recommendations are important for sustainable development in the region.

**Recommendations**

• Haridwar Development Region, the area of present study is spread over five districts, namely Haridwar, Dehradun, Bijnor, Tehri-Garhwal and Pauri-Garhwal. There are wide administrative as well as physical differences that hinder a uniform plan and its execution. Hence, there is an urgent need of administrative homogeneity for the proper planning of the region. Similarly, the region also demands area specific planning because of the existing physiographic differences. The problems faced by the village community in the northern region are different to that faced by the rural population in the southern region.

• The Master plan of Haridwar Development Area was prepared for the duration 1985-2001 and implemented in the year 1992 while the Rishikesh Masterplan was prepared for 2001-2010 and has not been implemented yet.
This is one of the greatest demerits of the planning process in the region. It is realised that the preparation and execution of these plans uniformly for the entire area can be more beneficial for balanced development of the region.

- The planning process of the urban development plans should also involve the entire rural area included in HDR. The pattern of land use pattern has shown that the agricultural land is being converted to non-agricultural uses very rapidly especially adjacent to the urban boundary and along the major highway. This conversion of agricultural land without following any regulations has led to establishments of many unauthorised colonies in the inner distance zone. It is unfortunate that there is no strict regulation and implementation of the existing master plan which was prepared 20 years ago and many of its proposals like the acquisition of land in the surrounding rural areas are lying in conflict and have not been materialised.

- It is also suggested that there is strong need of some rural planning and development agency which could plan and develop the rural areas in a systematic manner. In the absence of proper regulations and monitoring of the planning process the household amenities in the villages like toilets are designed by the individuals keeping in view their own interest which creates problem. Similarly monitoring/keeping vigil on the felling of trees and collection of firewood from the forests is also an important aspect that needs immediate attention. Moreover, increase in population density and congestion in the villages has led to problems like disposal of solid and liquid waste which results in various other related problems like overflowing of drains, foul smell from garbage disposed in the open and deterioration in the overall physical environment of the village and it needs attention. The rural planning agency can take care of these aspects in improving the quality of life in the rural areas.

- Acquisition of land at appropriate time is very important. The authorities should convince the farmers well in advance and start the planned activities as per schedule. It is observed that large tracts of land remain unused for long period even after acquisition which encourages the farmers to agitate for further compensation.
- In the present set up, the rural areas are exempted from various restrictions. Under exemptions the rural areas are not required to get any approval of any authority for the location or construction of buildings in the village. All these exemptions are misused by the people and results in the physical deterioration of the rural environment.

- Informal land market needs to be sidelined and efforts should be made to review the land acquisition policy.

- To promote agricultural growth and protect further decline in the agricultural land some policies should be formed which restricts this land use conversion. Strict land use policies for agriculture and allied sectors like animal husbandry are required with zoning of areas for such activities.

- Planning and strict regulation and monitoring of all the executed plans is very important. Specific width of roads, lanes and by-lanes which has been fixed by the authorities should be strictly followed. Similarly provision of community facilities like parks, play grounds, dumping ground for waste disposal of the village, site for community gathering, a reading room or library should be made and later should be monitored regularly.

- Improvement of rural infrastructure especially in terms of accessibility like metalled all season roads, availability of cheap public transport facilities and improvement of frequency of these services is required.

- The availability of public health facilities is inadequate and unsatisfactory in the region. Hence, most of the people are depending on private health facilities and at times are at the mercy of quacks. Therefore, there is an urgent need to strengthen the existing health care facilities, by regular monitoring and supervision by the authorities. Secondly, public-private partnership between the government and the private providers can help to provide quality healthcare to villages using existing government infrastructure.

- Analysis of the data on dependency of the villages on the city has shown that if the basic facilities are provided within the villages then the frequency of visit to the city can decrease significantly which on the other hand, can help to ease the pressure on the two the sprawling cities. As it is
not possible to provide the entire infrastructure and other facilities in each village; hence, it is suggested to develop certain villages as growth centres.

- On the basis of the pattern and intensity of interaction of settlements among themselves five rural settlements are identified as growth centres during the study. These are Shyampur Nuabad, Bahadarabad, Jagjeetpur, Shyampur and Tapovan. All the above villages are relatively more developed and have basic facilities of health, education, finance etc. and thus can be developed as growth centres.

- It is also suggested that the proposed growth centres should be approachable from all the villages in the region by good condition all weather roads. Moreover, the rural population should have accessibility to these growth centres with cheap and frequent public transport facilities.