

# CHAPTER - I

## INTRODUCTION

### 1.1 Introduction

Urbanization, an indicator of modernization, progress and development is a worldwide phenomenon though it differs in its nature, character and magnitude in the developing and the developed world. It refers to a demographic change involving an increase of population in urban settlements guided by the push and pull factors. The degree of urbanisation is felt in two ways - an increase in the size of an individual concentration and in the multiplication of points of concentration (Tisdale, H., 1942). According to 2011 census, 377 million Indians comprising 31.16 percent of the country's population live in urban areas. The most striking feature of India's urbanisation is that the process of accumulation of rural population in large urban centres as well as in smaller ones resulting in a lopsided tertiary base and informal sector. Though a recent phenomenon in India, it is posing a serious threat to the sustainability of urban environment. Urbanization is intrinsically linked with the development process as the degree of urbanization is a good indicator of the level of development in a region and aids in analyzing the quality of life in spatial perspective. The concept of development connotes the multi dimensional improvement of a region which is well revealed in an increase in employment opportunities, level of income, availability of economic infrastructure, social infrastructure as well as increased production, investment and consumption. As stated by David Ley (1983), development in its broadest sense refers to human well-being or quality of life, the quality of life experienced by an urban household, being a product of the opportunities available for securing those resources that its members hold most dear for their own welfare (Mohapatra and Das, 1998).

In the present study, the level of urban development encompasses an arena of increase in urban population, level of socio-economic development, level of infrastructural development and level of quality of urban life. However, the concept of urban development should be viewed not only in the context of the quantity of production but also in the context of nature of resource distribution, level of technology and the distribution system. It is a well known fact that urban service delivery system is an integral part of urban development, the harmonized distribution of which can promote the growth and all-round development of towns and cities on the one hand and its inequitable distribution can be the major cause for the biased development, deterioration and ultimate decline on the other. There has been a growing disparity in socio-economic development at micro and macro level the country over,

be it a metropolitan city, medium or small town. Large disparities in the level of urban development are the root causes of socio-economic conflicts and tensions. These disparities are basically the result of differences occurring in the resource distribution system, the differences being natural and man-made in nature.

However, the role of urbanisation as a contributor of development has become questionable in recent years. In conjunction with positive impact of urbanization, its negative implication, therefore, cannot be overlooked, which results in the deterioration and lowering of the overall quality of life and level of living. Kurseong town is no exception and is not free from multifaceted problems associated with the process of urbanisation such as poor housing, traffic congestion and transportation bottlenecks, poor sewerage system, acute water scarcity, problem of solid waste disposal, lack of parking space etc. and loss of socio-economic and spatio physical aspects of sustainability. Hence, the study of the environmental setting of the town, the ongoing developmental processes in its different parts, its boundary and existing land use becomes essential as it positively and negatively signifies its desirability as a residential town and to a large extent shapes its future growth. Furthermore, the gap in the delivery system of urban services is fairly wide in Kurseong town and has significantly increased over a period of time. The quality of life has thus deteriorated due to widening gap between the demand and supply of essential civic amenities owing to continuous influx of migrants from the surrounding rural areas and from the neighbouring countries such Nepal, Bhutan and Bangladesh (Field Survey). An understanding of the process of demographic, social, economic and physical changes operating in spatio-temporal context responsible for characterizing Kurseong town as an individual urban settlement, therefore, demands greater attention.

A detrimental and unwanted phenomenon of regional disparity is a challenging issue for the planners and policy makers in the developing countries like India. Past literatures reveal that small urban centres with less than 100 thousand persons, are suffering more from lack of basic amenities compared to cities with population more than 100 thousand persons (Bhagat and Prihar, 2007). Disparities in the level of development in these small towns are reflected on the spatial variation of quality of life and level of living of the inhabitants. The basic objective of the present study is to examine more specifically and scientifically the level of development of Kurseong town in terms of social, economic and demographic aspects and suggest ameliorative measures to minimise the disparities among the wards of different sizes to its maximum possible extent.

## 1.2 Statement of the problem

The process of urbanization and an unprecedented growth of population have taken place at an alarming rate, be it a metropolitan city or a town throughout the country, which has intensified the aggravation of urban problems. Unplanned growth, overpopulation and the associated problems are common, especially in the hill towns of India. The same holds true for Kurseong town, as its functions have multiplied since its inception and it became more than a mere recreation centre. Owing to the availability of very few suitable sites, the common practice of constructions on difficult terrain in the study area has led to either congestion or unplanned structure in haphazard manner. Congested or scattered housing pattern create problems of transport and communication and affects the uniform distribution of basic civic amenities. Further being located in Darjeeling Himalaya, a highly seismic zone (Zone IV), the emergence of high and huge structures disregarding measures against earthquake, landslides, fire accidents and building norms etc. has further aggravated the problem. The trend of urban concentration reveals that the population of Kurseong town increased nearly fifteen times from 2836 in 1879 to 42446 in 2011. Since its inception in 1879, Kurseong Municipality has been experiencing rapid growth of population, especially after 1981. The growth rate was 48.59% during 1981-1991 and 49.56% during 1991-2001. The decadal growth rate of Kurseong Municipality during 1991-2001 is highest among the urban centres of Darjeeling hills. According to 2011 census the population density of the town is 5407 persons per km<sup>2</sup>, which is higher than the district hill-urban (2838 persons per km<sup>2</sup>) and district urban (4743 persons per km<sup>2</sup>) average.

The construction, maintenance, provision and distribution of basic urban infrastructure and amenities become a major problem for hill towns owing to ruggedness of terrain, lack of suitable site and various environmental constraints. Therefore an empirical study on the site and situation and the processes of growth and expansion of Kurseong town is essential for its future growth and sustainable development. Moreover, the concentration of basic urban services to a few pockets of the town has caused a serious concern for a balanced urban development. The present study is an attempt to evaluate whether the existing civic amenities cater to the ever increasing population in the municipality area. The tremendous growth of urban population has not only stimulated the demand for resources and intensified their utilization but also has resulted in tremendous pressure on the existing infrastructure and the environment of Kurseong town threatening its sustainability. Therefore, an attempt will be made to find out whether the urbanization which is taking place in Kurseong town is at par with the level of development of its civic amenities because though urbanization is an integral

part of the development process, one cannot deny the fact that besides opening vista for various opportunities and new possibilities, the process of urbanization is also associated with multifarious problems which are complex in nature. Further, the study on the level of urban development has been elaborated by highlighting on the spatial disparities in the level of demographic development, level of socio-economic development, level of infrastructural development and assessment of overall development with detail household survey to study the importance of the spatial dimension in urban planning for optimum location and allocation of amenities and services to ensure better socio-economic life of the residents of Kurseong Municipality. The importance of the study of an individual town lies in the fact that an urban place or an individual settlement unit possesses a distinctive morphology which has evolved through different historical periods under the impact of internal and external changes. Since urban settlement is said to be a man made habitat, the study of the set of reciprocal relationship between man, his work and the environment is necessary.

### **1.3 Objectives of the study**

Though extensive literature exists on the growth, development and associated problems of metropolitan cities, the available literature on the same for small towns is inadequate. Further, the study on hill towns especially at ward level is very limited. Little is known about the level of development in terms of demographic, socio-economic and infrastructural aspects at micro level especially in Darjeeling hill towns. Moreover, the policies aimed at development of hill towns fail to include integrated planning with holistic approach keeping in view the fragility of the region. Since infrastructure forms an indispensable part of urban structural system for its development, improving sound infrastructural base with emphasis on the importance and necessity of parity between population and urban utility facilities in concomitance with natural environment would go a long way in making an urban centre sustainable. There is an ample scope for research for examining the interrelationship between the infrastructural facilities available and the size of population, area of each ward, socio-economic classes of the inhabitants and scale of economic activities focussing on the resource potential and the growth parity between population and resource.

The negative impact of urbanisation is an important issue which can be taken up with various dimensions in relation to development with environment friendly technology. The findings with regard to spatial disparities in spheres of socio-economic activity, civic amenities and the level of development, the causal factors and the associated problems therewith becomes relevant for making prescriptive recommendations for the purposes of

taking corrective planning measures for future. With the identification of the prospectives of future research areas in the above mentioned aspects in a hill town, the present study would make an effort to incorporate these issues into the analysis of level of development at ward level to bridge these research gaps.

The study has been undertaken with the following specific objectives:

- i. To study the spatial and temporal demographic change in Kurseong town since its inception and to study the reasons for the rapid growth of population in Kurseong Municipality after 1981.
- ii. To study the factors that have led to haphazard expansion and the changes in its existing land use and land values through various stages of its growth.
- iii. To correlate the growth rate of population with the level of development of infrastructural facilities and to evaluate the socio-economic development.
- iv. To identify different problems in the way of urban development and suggest appropriate measures.

#### **1.4 Significance of the study**

The rapid growth of population in urban centres of different sizes all over the country characterised by spatial clusters has left the governments at different levels with very little consistent policies to deal with the multifarious urban problems. Although the governments at various levels have expressed grave concern about the growth of cities, yet smaller towns in this regard especially the hill towns are the most neglected ones. As a result, rapid growth of these towns, the associated development aspects especially in terms of demographic, social, economic and cultural ones have become important. The present study is an endeavour to evaluate more precisely and scientifically the level of development and classifies different wards of Kurseong Municipality accordingly for the purpose of effective planning.

The study is significant because of the fact that no work exists till date which has taken into consideration all the wards of Kurseong Municipality for the purpose of identifying spatial disparities in the level of development in terms of their population size and social and economic infrastructure. The study, therefore, aspires to be the first of its kind in highlighting the spatial disparity in the distribution of urban utility facilities and its impact in the development of Kurseong town since most of the research related to Kurseong town and other towns in Darjeeling hills has focused on the physiography, environmental degradation and tea and tourism industry. The findings of the present study will help to understand the spatial disparities in the level of development as reflected in demographic, social and economic characteristics at ward level and the associated multi-dimensional urban problems

which stand on the way of growth and progress of Kurseong town. The result will also help to identify the less developed wards which need attention for planning in order to divert the required socio-economic inputs. The findings of the study can be utilized in formulating policies and development plans for minimising the spatial disparities and ultimately bringing about a balanced development of the town under study.

### **1.5 Review of Literature**

A review of some literatures relevant to the issue taken up has been attempted for the present study, though the literature on the headings like ‘quality of life’, ‘level of development,’ ‘regional disparity in infrastructural development’ etc. especially in hill towns of India is very limited. A survey of past literature is an integral part of any research work as it helps the researcher to find out the research gaps and necessity of the present study. Various scholars have studied the process of urbanization and levels of development with different methodologies and viewpoints in the past and at present. The review of related literature has been done on the following subheadings relevant to the present study – process and trend of urbanisation in relation to demographic and socio-economic characteristics, urban problems, urban morphology, magnitude of regional inequality at different levels and inter-regional disparities in the quality of life and the level of development at different levels with emphasis on the available infrastructure.

The process and trends of urbanisation is found in the works of scholars like D. S. Chauhan (1966) highlighting on the issues like migration, employment and unemployment in Agra where he studies the three aspects of change- economic, social and behavioural through opinion research in a most simplified way; H. G. Hanumappa (1981) studies the urbanisation trends in India with particular reference to a medium town; Sivaramakrishnan, Kundu and Singh (2005) studies the relationship between urbanisation and related developmental indicators at the state and district level; Shafiquallah (2001) studies about the various facets of process of urbanisation, levels of development and their relationship among the districts of Uttar Pradesh; Krishnaiah and Ramanaiah (2002) have studied the urbanization process and identified the areas of different levels of development on the basis of various socio-economic indicators in Andhra Pradesh; Bandyopadhyay (2010) has attempted to study the of urban development and related problems in Memari Municipality; Mazumdar (2005) conducted the study on the urban development in Jammu and Kashmir analyzing the effects of urbanization thoroughly analyzing the major problems related to urbanization in the context of planning for formulating a state urban policy for sustainable development; Ahmad and Ali (2006) examined the impact of socio-economic and demographic factors on the level of urbanisation

in West Bengal and observed a positive correlation between the available amenities and the level of urbanisation on the one hand and a negative correlation between the growth of population, share of SC and ST population, agriculture and cultivation and the level of urbanisation on the other; Chakraborty, Chatterjee, Das and Rou (2015) have attempted to explore the changing pattern of urbanisation at district level in West Bengal highlighting on the significance and future of newly developed small towns over the urban landscape; Saini, (2008) has attempted to analyse the growth patterns of different size class towns of Western Rajasthan; Alam, Nandi and Malik (2009) brings out the spatial and temporal pattern of urbanisation in municipal towns and census towns of Murshidabad district by calculating composite urban index and allotting ranks to these towns; an attempt has been made by Megeri, Kadi and Kengal (2012) to measure and analyse urbanisation process in terms of the degree of concentration, the pattern and distribution of urban population in Indian cities of different categories by computing exponential growth rate, degree of urbanisation, scale of urbanisation and population concentration, Gini Concentration ratio and Lorenze Curve with 1901 – 2001 census data, to exemplify a few.

Rao (1981) after conducting a comparative study of the demographic characteristics of migrants in Warangal and other class I towns of Andhra Pradesh identified high ranked and low ranked areas with the application of modified form of Social Area Analysis technique. He opines that instead of adopting same type of urban planning policy for the city as a whole it is necessary to adopt plans on the basis of social areas as he finds that Warangal city has both a zonal and sectoral distributional pattern of demographic characteristics as well as different social areas. Similarly, Kulkarni (1981) examines the demographic and occupational characteristics, economic flow patterns and movement patterns including commuting patterns for work, shopping and recreation in relation to the social areas in Nasik city with a discreet use of quantitative methods. The author (1984) again studied the process of crowding in Ahmedabad city analysing the demographic and economic characteristics, social amenities and its impact on social well being and health.

Datta (2006) in 'Urbanisation in the Eastern Himalayas: Emergence and Issues' reveals the tireless contribution of many scholars in the field of various aspects of urbanisation in the north-eastern states of India. The contributors to this edition highlight on the trends in the level of urbanisation; distribution and the growth of towns and cities in different size classes and their respective population; the impact of urbanisation on Darjeeling town during the colonial and post colonial period; the genesis of the process of urbanisation

in Kalimpong; a comparative picture of the pattern and level of urbanisation and functional classification of towns between the Eastern and Western Himalayas.

Many scholars have focused specifically on urban problems. Chatterjee (2007) examined open space associated problems in Kolkata Municipal Corporation and recognised the large scale post partition immigration of refugees and illegal settlement on open spaces as the main cause for diminishing open space and has given a detail account of the remedial measures taken up by K.M.C to tackle this problem. Kadi, Halingali and Ravishankar (2012) have studied in detail the multifarious problems associated with urban population in India and have put forward some suggestions for the improvement of basic civic amenities such as housing, drinking water, waste management, sanitation and transport. The studies by Singh, Gupta and Lamichhane (1998) for Gorakhpur city, Tripathi (2008) for Ballia district of Uttar Pradesh, Sivaramakrishnan and Sarkar (2011) for Kolkata Metropolitan Area (K.M.A), to mention a few were also on a similar line.

Studies also exist on the urban morphology at different levels. Singh (1980) studies the existing land use pattern of Shillong Agglomeration efficiently highlighting on the functional structure of markets, various categories of land uses, their problems and the possibilities for improving the land use in such areas; Sharma (1985) examines the morphological and functional analysis of Rohtak city in Haryana on the basis of empirical findings. The author reveals his bold proposal, practice and operation of perspectives, parameters and principles avoiding the western models in explaining the urban growth and ecological processes as he opines that the Indian cities do not yet possess the social mobility and economic vitality of western cities. Upadhyay (1992) brings out the salient features of Jaipur's urban landscape laying emphasis on its evolution and land use pattern and after carefully analysing and interpreting all the pertinent social and economic facts, recommends a proposal for a comprehensive urban land use planning. Pal (2000) in his doctoral thesis explains the problems associated with the urban population of Kurseong town. Detail investigation on the urban morphology of large and medium towns is also found in the works of scholars such as Katakey and Sharma (2002) - Jorhat in Assam, Malik, Gupta, Mondal, Hazra, And Mitra (2007) - Bolpur Town, Swamy And Mahesh (2010) - Gulbarga City, A. N. Tiwary, Singh and Sharma (2010) - Mirzapur City etc. The dynamics of urban land use associated with change in population, diversification of economy and urban expansion with the application of GIS techniques can be found in the works of scholars such as Kumar De and Mukhopadhyay (1993), Sharma, Tripathi and Singh (2005), Kaushik and Kaur (2009),

Singh (2010), Sharma and Mishra (2011), Chatterjee (2011), Kumar (2011), Chatterjee and Sharma (2011) and Gupta and Singh (2011).

Several studies on the examination of magnitude of regional inequality at different levels have been made in India and abroad as well, though the study at the smallest unit like ward level particularly in hill towns is very limited. Different scholars like Hassan Dasapattanayak, and Misra, (2007), Bishnoi and Aneja (2008), Hangaragi (2008) etc. have attempted to assess the block level regional disparities by taking various socio-economic, cultural and demographic indicators into consideration by applying statistical techniques like composite index, factor analysis, correlation matrix, correlation coefficient, standard scores and principal component method. Similarly, Patra (2010) has attempted to examine the inter-regional variation in infrastructural facilities across 30 districts of Orissa with the help of Principal Component Analysis by integrating various components of infrastructural services. Another attempt has been made by Chakraborty (2009) to measure and assess the temporal variations and the extent of inter block disparities in the availability of basic infrastructural development in Birbhum district in terms of available facilities such as transport, communication, education, health, recreation, security, banking electricity etc. A critical analysis has been made in the inter-district inequality in infrastructure in Assam by Adhyapok and Ahmed (2012).

The contribution in examining the regional disparity at ward level can be found in the papers of some scholars like Ali and Varshney (2010), Paul (2013), Ghosh and Maji (2011), Mondal and Garg (2007), Roy and Sivaramakrishnan (2013), etc. Ali, and Varshney (2010) have focused on ward-wise variation of availability and accessibility of socio-economic facilities in Aligarh city with the help of Principal Component Analysis. The magnitude of inter-ward disparities of the levels of socio-economic development has been analysed and the factors leading to such disparities has been identified based on primary data collected through intensive field survey. Mondol and Garg (2007), in their attempt to envisage the level of development used geo-informatics techniques for the identification of existing urban utility facilities and analysis of infrastructural development. He used ward wise rank analysis method of different utility facilities by deducing the composite indicators and based on MFCI (Modified Final Composite Indicators), classified different areas of level of infrastructural development.

In India, studies on the quality of life are rather scarce if not rare. Fakhruddin (1991) investigates the quality of life of Lucknow city with the help of selected indicators focusing on the socio-economic and technical changes taking place in this urban centre. A large

number of variables that author thought are indicative of quality of life were chosen, under five broad categories of indicators namely material status, health and nutritional status, cultural level, housing standards and territorial stresses. He found, after the analysis, that the evolution of the residential pattern and environmental structure in the city are the outcomes of the persistence of traditional structure, colonial modification, underdevelopment and poverty. In another study on quality of urban life, Mohapatra (1998), selecting ten variables - which according to him indicate the quality of life of the poor - under four broad sets of indicators namely demographic, social, infrastructural and economic, made an attempt to analyse the case of the urban poor in Shillong city. With the application of composite index of quality of life, the households surveyed in different localities were categorised under five broad categories exhibiting different levels of quality of life. He found that variations existed in the quality of life and response to the infrastructural needs among the tribal poor and the non-tribal poor due to differences in cultural attributes and view towards the quality of life. Bishnoi and Aneja, (2008) have attempted to measure the extent of inter-district disparities in agricultural, industrial, basic infrastructure and services sector development and overall development in Haryana with the application of two commonly used methods Development Index, a weight free index and Principal Component Analysis Index (PCA), a weighted method and found out that out of total 16 districts 7 were found to be overall developed districts. Nayak, and Narayankar (2009) have attempted to examine the inter block disparities in the levels of development considering the social, economic and demographic indicators. The identification of socio-economically backward areas has been made and the same has been categorised into various levels of development. Various factors leading to disparities, correlation between these factors and over all development have been found out with the help of composite index. Dave (1991) has attempted to evaluate the levels of socio-economic development in the towns of Gujarat taking demographic, social and economic indicators into consideration also highlighting on the perception of levels of development with regard to civic and social amenities.

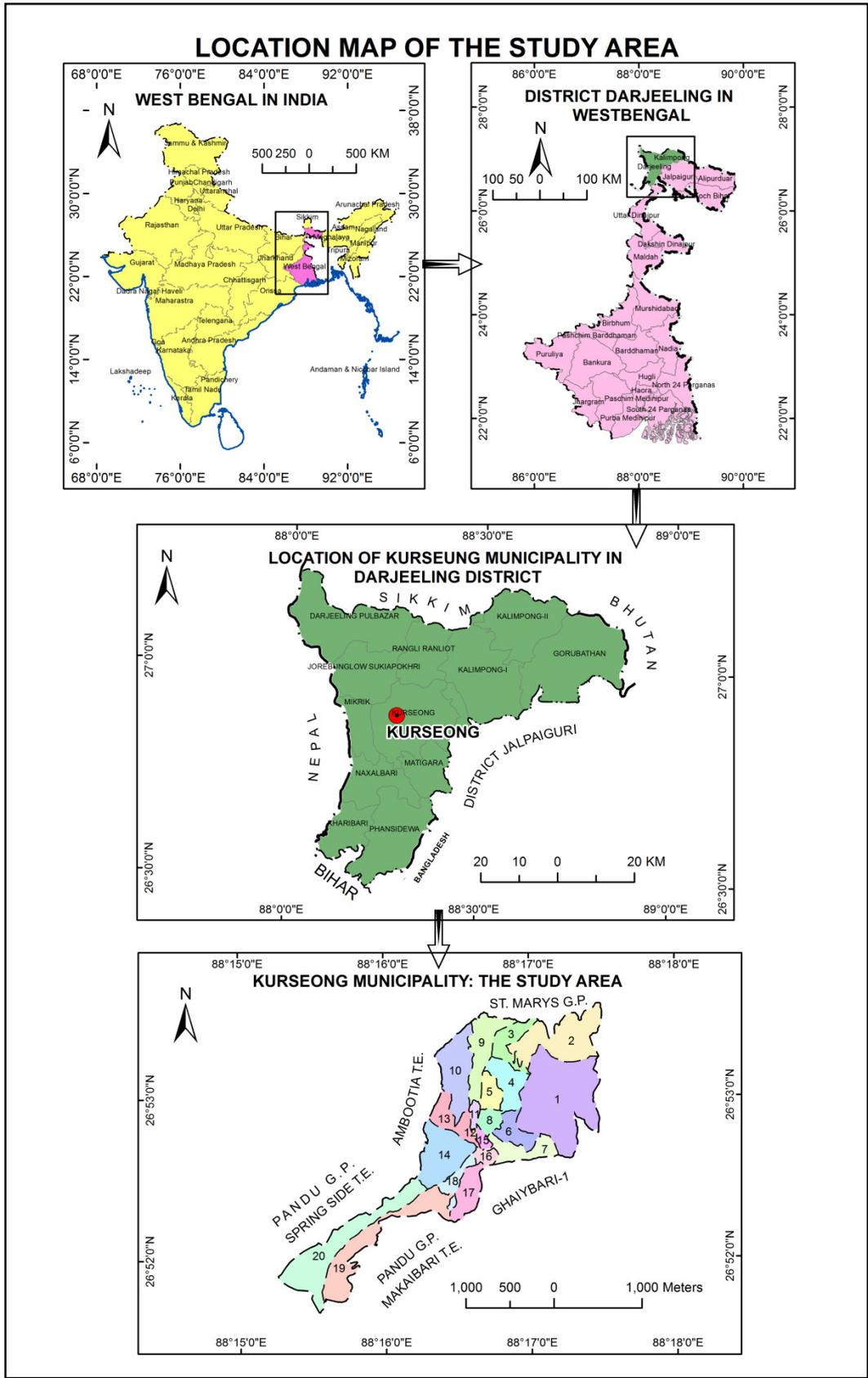
The inter-regional disparities of the infrastructure have also been analysed by several authors viz. ward level analysis and deficiencies of accessibility of urban public services with emphasis on health and education by Roy and Sivaramakrishnan (2011); block level disparities in the levels of development taking into account socio-economic indicators such as demographic characteristics, occupational structure, infrastructural facilities and agricultural development and identifying areas with different levels of socio-economic development based on average composite rank value by Shukla (2013). At a more detailed level, Chandel

and Pal (1993) measured the existing inequality of infrastructure at block level, analysed the disparity in the levels of development and has planned strategy for balanced infrastructural development. Taking into account the fifteen sets of criteria of levels of infrastructural development relevant to India, classification of region into high, moderate and low developed region has been attempted on the basis of composite index using factor analysis techniques. Alam (2013) has endeavoured to analyse the perception pattern through the basic understanding of the behaviour of the people in terms of their opinion, attitudes and levels of satisfaction in Berhampore town of Murshidabad district in order to determine the level of satisfaction of urban infrastructural quality as expressed by the residents.

There are many scholars who have taken up the issues of basic urban amenities like water supply, sanitation, waste disposal, health, housing, transportation, recreation, land value etc. separately such as water supply - Siddique and Dawn (2009), Abebe and Singh (2012), Ghosh, Biswas and Mandal, (2011), Singh and Singh (2012); health - Chettri and Sahu (2011), recreation - Bandopadhyay (2012), transport - Dutta and Mistri (2012), Kaushik and Kumar (2013), Dutta (2014); solid waste – Siddiqui and Tah (2007), Dutta (2010), Siddiqui and Siddiqui (2010) ; sanitation - Singh (2008); land value – Wishwakarma (1980) etc. to name a few. The review of literature reveals that no research work has been carried out at ward level infrastructural development of Kurseong town in recent years which has prompted to take up the present study.

### **1.6 Aspects of the Study Area**

Kurseong was constituted as a municipality in 1879, before which, it was under the supervision of Darjeeling Municipality constituted in 1850. This tiny hamlet later, developed as a tourist destination in 1880, for colonial authorities and also as a preferred place for a sanatorium. According to a report by the then Health Commissioner of Bengal, the total population of Kurseong Municipality was 2836 consisting of 1797 male and 1039 female (Rai, 1979). For the purpose of administration of Kurseong town, a Board with 6 Municipal Commissioners nominated by the Government was formed to administer its affairs. The Bengal Municipal Act of 1900 divided Kurseong town into six wards (Pradhan, 1979). In 1936 the Municipal Board was reconstituted and in 1967 the delimitation of the ward boundaries took place for the first time. The town was divided into twelve wards (Kurseong Municipality Office). The rapid increase in population since its inception especially during 1981-1991 led to the further delimitation of ward boundaries. At present it has an area of 7.85 km<sup>2</sup> consisting of twenty wards.



**Figure 1.1 Location map of Kurseong Municipality**

The study area is the administrative headquarter of Kurseong Sub-division which is situated at 26° 51'42" N to 26° 53'36" N latitude and 88° 15'12" E to 88° 17'32" E longitude in Darjeeling district of West Bengal. The distance of Kurseong town from Siliguri is 48 km and from Darjeeling is 30 km. Located at an elevation of 1482m above sea level, Kurseong is situated on the southern slope of the Senchal-Mahaldiram range, radiating in the north from the Ghoom ridge of Darjeeling Himalayas and gradually descending further down to the plains of the Terai. The region is composed of resistant Darjeeling gneissic rocks with northerly dips. The average slope of the town is 22° 55'. The town is bounded by two perennial streams namely Hussain Khola in the north and Dhobi Khola in the east. Further the thick Dowhill Reserve Forest bounds it in the east and it is bounded by the tea gardens in the west, north-west and south. The Dowhill ridge, a part of the Jalapahar Ridge shuts it out in the east from the Tista valley. Barring the above mentioned perennial streams, the numerous streams that drain the municipality area are non-perennial in nature. The town has a moderate and favourable climate for human habitation as it neither suffers from severe winter like that of Darjeeling nor from scorching heat like that of the plains. The mean maximum temperature of Kurseong town ranges between 12.30°C and 25°C, while the mean minimum temperature ranges between 6.80°C and 19.50°C (Darjeeling Tea Research Centre). Kurseong being situated in the southern slope of the range receives higher rainfall compared to other urban centres of Darjeeling hills. The average annual rainfall is 4000 mm (Darjeeling Tea Research Centre). The soil found in the region is red brown in colour derived from the weathering of gneissic rocks.

### **1.7 Research Questions**

In view of the facts stated in the review of related literature, the study seeks to provide answers to the following research questions.

1. How can different wards of Kurseong town be classified on the basis of their demographic components?
2. Has migration from the surrounding rural areas contributed to the rapid growth of population in Kurseong town?
3. Has urbanization affected the development of Kurseong town positively or negatively in recent years?
4. What are the past and the present land use and land value patterns of Kurseong town?
5. What are the spatial patterns of the provision and distribution of various urban utility facilities in Kurseong town?
6. Has rapid population growth placed an enormous burden on the civic amenities?

7. What are the factors determining the spatial disparity in the level of development at ward level?
8. What are the effects of spatial disparity in the level of development in different wards of Kurseong town?
9. What improvements are needed in the planning policy for future development of Kurseong town?

### **1.8 Research Hypothesis**

The entire study will be made on the basis of the following hypothesis:

- i. Rapid growth of population of Kurseong Municipality area has taken place due to migration from the surrounding rural areas.
- ii. The quality of life of the people varies in the C.B.D. and the peripheral area of the Kurseong Municipality.
- iii. Urban population growth has placed enormous burden on the basic civic amenities through its increased exploitation.
- iv. There are spatial patterns of imbalance in the provision and requirement of basic amenities.

### **1.9 Research Methodology**

Methodology is a pivotal part of any research work which helps in scientific explanation, examination and description of reality. For the fulfilment of the objectives discussed above, the methodology to be adopted by the investigator is rationalistic and quantitative. The major focus is on the interpretative description of the existing morphological patterns and assessment of level of development of the town at ward level. The methodological framework for the present study comprises of the following three stages: pre-field, in-field and post-field sessions.

The pre-field activity consisted of reconnaissance survey and planning of the entire course of action and in this session, survey of the available relevant literature related to the issue taken up was done at first followed by the formulation of the objectives and the hypotheses.

The collection of information from the primary and secondary sources was the second step. For supplementing the available secondary data sources, primary data sources are essential especially of the household sector at the urban spatial unit level. The complete enumeration of the household at the urban spatial unit level is impossible due to several constraints especially time. Thus there is a need for sampling technique which will be able to give the required data in the form of precise estimates. In survey, the optimum sample size is

fixed by striking a balance between the degree of precision required and representation on the one hand and time and cost constraints on the other. Though several methods like cost and precision functions have been designed by many scholars like Mc Hugh (1961), Thompson (1961), Murty (1963), Mace (1964) etc., the sample size has been fixed keeping precision, representation and time factor into consideration. Thus a sample accounts for 10% of the total urban households. The sampling method used is a multi-stage random sampling without replacement for a better representation of the samples from the universe. The sampling unit is arranged in some order. In the first stage twenty wards of Kurseong Municipality are taken into consideration. Then from each ward 10% of the total households are taken as a sample randomly so that the representation of the households is done in a systematic manner. This way, better projection and representation of the households is possible with more precision and accuracy.

**Table 1.1 Sample size of households, Kurseong Municipality, 2011**

Wards	Number of households*	Sample size of the households**	Wards	Number of households*	Sample size of the households**
1	280	28	11	234	23
2	378	38	12	172	17
3	271	27	13	381	38
4	422	42	14	353	35
5	387	39	15	160	16
6	250	25	16	229	23
7	512	51	17	503	50
8	373	37	18	319	32
9	443	44	19	220	22
10	392	39	20	337	34

Source: \* Census of India  
 \*\* Computed by the researcher

The primary data were collected by a rigorous field survey with the help of questionnaires. The questionnaire surveys were carried out to collect information regarding the type, structure and composition of households, provision of existing civic amenities as well as the ongoing developmental activities in the study area. The questionnaire surveys were also undertaken to collect information from different schools in and around Kurseong with regard to the infrastructure, student and staff strength, their origin of residence and

educational qualification of the staff. Similarly, survey was also conducted in different offices, public libraries, banks and post offices pertaining to the staff strength, number of account holders and annual transaction. The survey of taxi syndicates in Kurseong Municipality was conducted to find out the trip frequency of passenger vehicles between Kurseong town and the surrounding areas. Further, a classified traffic volume survey was also undertaken by the author on NH 55 and the average was taken to determine the traffic volume towards Darjeeling and Siliguri.

The GPS locations of different social and economic infrastructure were collected from the field survey. Detail information on different civic amenities was also collected from the reports prepared by the municipality officials such as Municipality Engineer, Urban Planner, Sanitary Inspector and Tax Superintendent. Maps and photographs portraying and displaying different parts of the town and the characteristic landscape features are used both for analysis and description. The secondary data was collected from government and non-government offices, published and unpublished records, maps, reports and tabulated data etc. For the present analysis, the appropriate statistical techniques have been used to analyze the data and derive meaningful generalizations with the help of statistics software SPSS Version 23. GIS software Arc GIS 10.3.1 with different geo-processing tools was used for linking spatial and attributes data for querying of information and for portraying them in maps. The techniques of analysis also include cartographic representation which covers pie graph, proportional circles, proportional divided circles, choropleth, flow and bar diagrams. Land use maps have been prepared with the help of data and information obtained from Google Earth.

The following research methodologies were adopted and used in different sections of the thesis:

### **Chapter III**

$$1) \text{ Population growth rate} = \frac{\text{Present population} - \text{Previous population}}{\text{Previous population}} \times 100$$

$$2) \text{ Index of population growth} = \frac{\text{Current population}}{\text{Population at the beginning}} \times 100$$

$$a) \text{ Natural increase in population} = \text{No. of births} - \text{No. of deaths}$$

$$b) \quad \text{Increase} \quad \text{in} \quad \text{percent} \quad =$$

$$\frac{\text{Present natural increase in population} - \text{Previous natural increase in population}}{\text{Previous natural increase in population}} \times 100$$

$$c) \text{ Percentage to total natural increase} = \frac{\text{Individual natural increase in population}}{\text{Total natural increase in population}} \times 100$$

3) Future population growth:

Population projection:

a) *Linear growth:*

$$P_t = P_o (1 + rt),$$

Where,  $P_t$  = Estimated population,

$P_o$  = Population of the previous decade,

$t$  = time interval,

$$r = \frac{P_t - P_o}{P_o \cdot t}$$

b) *Geometric growth:*

$$P_t = P_1 (1 + r)^{10}$$

Where,

$P_t$  = Estimated population

$P_1$  = Population of the past decade

$$r = \text{antilog} \left( \frac{1}{10} \log \frac{P_t}{P_1} \right) - 1$$

c) *Exponential growth:*

$$P_t = P_1 \times e^{r \cdot 10}$$

Where,

$P_t$  = Estimated population

$P_1$  = Population of the past decade

$$r = \frac{1}{t} \left( \log_t \frac{P_t}{P_o} \right) \frac{1}{\log_{10} e}$$

$$\log 10^e = 0.4343$$

$t$  = time interval

4) Population density =  $\frac{\text{Total ward population}}{\text{Total ward area}}$

5) Decadal variation in population density =

$$\text{Present ward population density} - \text{Previous ward population density}$$

6) Karl Pearson's Correlation Coefficient (r)

$$i) \quad r = \frac{n(\sum xy - (\sum x)(\sum y))}{\sqrt{[n\sum x^2 - (\sum x)^2][n\sum y^2 - (\sum y)^2]}}$$

Where, n = Number of pairs of scores

$\sum xy$  = Sum of the products of paired scores

$\sum x$  = Sum of x scores

$\sum y$  = Sum of y scores

$\sum x^2$  = Sum of squared x scores

$\sum y^2$  = Sum of squared y scores

7)  $CI = \sum_{i=1}^n (p_i - a_i) / 2$

Where, CI = Index of Concentration

$p_i$  = population of a ward divided by total population of the

municipality

$a_i$  = area of the given ward divided by the total municipal area.

Geometrically, CI is the deviation of the concentration curve from the line of equal distribution in a Lorenz Curve, hence CI is the proportion of inequality in the distribution of population in relation to the area. The index takes a negative value when the curve lies above the line of equality, indicating disproportionate concentration and a positive value when it lies below the line of equality. The overall concentration found in the curve has also been measured by Gini's concentration ratio which is a ratio of the area between the Lorenz curve and the diagonal line, and the total area of the triangle formed by the two axes and the diagonal line. This is Gini's concentration ratio.

$$8) \text{ Percentage to total} = \frac{\text{Individual value}}{\text{Total value}} \times 100$$

$$9) \quad \text{i) Effective Literacy Rate} = \frac{\text{Total literates}}{\text{Total population (7 years and Above)}} \times 100$$

$$\text{ii) Effective Male Literacy Rate} = \frac{\text{Total male literates}}{\text{Total male population (7 years and Above)}} \times 100$$

$$\text{iii) Effective Female Literacy Rate} = \frac{\text{Total female literates}}{\text{Total female population (7 years and Above)}} \times 100$$

$$10) \text{ MFDI} = \frac{(MLR - FLR)}{TLR}$$

Where,  $MFDI$  = Male-female differential index

$MLR$  = Male literacy rate.

$FLR$  = Female literacy rate

$TLR$  = Total literacy rate

$$11) \text{ i) Work Participation Rate} = \frac{\text{Total workers}}{\text{Total population}} \times 100$$

$$\text{ii) Male Work Participation Rate} = \frac{\text{Total male workers}}{\text{Total male population}} \times 100$$

$$\text{iii) Female Work Participation Rate} = \frac{\text{Total female workers}}{\text{Total female population}} \times 100$$

$$12) \text{ Sex ratio} = \frac{\text{Number of females}}{\text{Number of males}} \times 1000$$

$$13) P_m = P_d - (P_a + P_n)$$

Where,  $P_m$  = Total migrants

$P_d$  = Decade population

$P_a$  = Annual total population

$P_n$  = Natural increase in population

## Chapter V

14) Household density =  $\frac{\text{Number of households}}{\text{Area}}$

15) i) Estimated wastes = Average waste generation/day (URDPFI Guidelines) x Total population

ii)  $CE = \frac{\text{Number of vehicles} \times \text{Number of trips} \times \text{Vehicle capacity}}{\text{Total waste generated}} \times 100\%$ ,

Where,  $CE$  = Collection efficiency

ii) Sweeper population ratio =  $\frac{\text{Total Population}}{\text{Number of sweepers}}$

16) i) Shortfall of water per day =  $\frac{\text{Total water requirement per day}}{\text{Net amount of water available}}$

ii) Demand of water per day = Total population x average amount of demand of water (URDPFI Guidelines)

## Chapter VI

17) i)  $I_{ij} = \frac{\text{Max} - X_{ij}}{\text{Max} - \text{Min}}$

Where,  $I_{ij}$  = deprivation index of the  $i$ th variable at  $j$ th unit of study

$\text{Max}$  = maximum value of  $i$ th variable in the series

$\text{Min}$  = minimum value of  $i$ th variable in the series

$X_{ij}$  = the original value of  $i$ th variable at  $j$ th unit of study

ii)  $I_j = \frac{\sum I_{ij}}{n}$

Where,  $I_j$  = Average Deprivation Index of  $j$ th unit of study

$n$  = number of indicators under consideration in a particular group.

iii)  $DI = 1 - I_j$

Where,  $DI$  = actual Development in  $j$ th unit of study

1 = absolute developed condition

18) i)  $Z_i = \frac{(X_i - X)}{SD}$

Where,  $Z_i$  is the standard score of  $i$ th variable,

$X_i$  is the individual observation,

$X$  is the mean for variable and

$SD$  denotes standard deviation.

ii)  $C.S. = \frac{(\sum Z_{ij})}{N}$

Where,  $C.S.$  = Composite Mean Z-score,

$N$  = Number of variables or indicators and

$Z_{ij}$  = z-score of an indicator  $j$  in ward  $i$ .

- 19) The influence zones for each urban facility have been fixed up taking into consideration the walking distance in terms of its comfortability such as 250 m as comfortable zone and 500 m as moderately comfortable zone for primary schools, 500 m as comfortable zone and 1000 m as moderately comfortable zone for high and higher secondary schools, 1000 m as comfortable zone and 2000 m as moderately comfortable zone for college and so on. For the present analysis, using GIS software ArcGIS 10.3.1 with different geo-processing tools, the influence zones of various urban facilities available in Kurseong Municipality and the percentage of population served by each urban facility has been delimited and computed respectively.
- 20) Sturges' Rule has been applied to determine the number of classes and class interval for determining different categories.

$$k = 1 + 3.322 \log N$$

$$CI = \frac{\text{Highest Value} - \text{Lowest Value}}{K}$$

Where, N = No. of items/individuals

CI = Class interval

k = Number of classes

Thus, with the application of different appropriate statistical techniques using statistics software and remote sensing and GIS technology, the main focus of the study was on the identification of spatial disparity in the level of development in terms of concentration and distribution of urban amenities and identification of deficiencies in different wards of the town at the same time.

Finally the post-field session comprised of preparation of tables, analysis and presentation of data, their interpretation, derivation of meaningful generalization and report writing included compilation, tabulation and analysis of data.

For the compilation of the bibliography as well as the reference work, the libraries of North Bengal University, Kurseong College, Sikkim Central University, Bloomfield Library, Kurseong, Gorkha Public Library, Kurseong and District Library, Darjeeling has been thoroughly consulted. Finally, in order to understand the exact nature of the problem, all the data collected from the field and various institutions and government and non- government offices were analyzed, processed and computed to provide some feasible and corrective measures for an overall development of the area.

## **1.10 Organisation of thesis**

The study has been organised into the following nine chapters keeping in view the objectives of the study in order to provide a thorough understanding of the existing morphological patterns and assessment of the level of development of Kurseong town at ward level. The broad framework for the chapterization of the present work is as follows:

The introductory chapter provides a broad outline of the study. It intends to provide a brief discussion on the positive and negative impact of urbanisation and the associated problems. The chapter also outlines the aspects of the study area, specific objectives and significance of the study along with the research questions to be answered. A comprehensive account of the literature reviewed on the issues relevant to the present study and the research hypotheses tested in the course of study has been presented. The research design and the methodology adopted along with the various statistical tools that has been employed in different sections of the work have been discussed scrupulously.

The second chapter deals with the origin and evolution of the town during pre and post independence period with special reference to the foundation and growth of Kurseong town and its different phases of development during the British regime. The chapter also gives an account of the geographical background that has determined the location of the town on the present site. The historical events and evolution of the cultural landscape of the town under study as conditioned by its physical setting and historical antecedents is presented in general.

The third chapter is devoted to the study of varied demographic structure of Kurseong town in its temporal and spatial perspective i.e. distribution, trend and density of urban population, sex ratio, scheduled caste and scheduled tribe population, literacy, occupational structure and migration. The correlations among different demographic components, projection of population and population concentration have been examined with the help of various mathematical and statistical techniques. The analysis is based entirely on secondary data sources like the Census of India, District Statistical Handbooks and data collected from different government offices. The data on literacy rate and work force has been analysed with respect to male female differences for the present decade. The demographic structure as influenced by the geographical, economic and social factors and the influence of centripetal and centrifugal forces on the distribution of population has also been discussed. The research hypothesis with regard to migration has also been tested in this chapter.

In the fourth chapter, the land use pattern that reflects the functional character and the type of human activities operating on a parcel of land in Kurseong town has been dealt with.

The changes in land use under different categories during the period 2003 and 2016 as well as the land use change at ward level during 2003 – 2016 and the causative factors have been discussed thoroughly. The chapter also investigates the spatial and temporal variation in land value and the associated factors especially highlighting on the effect of land use on land value in the town under study.

The fifth and the sixth chapter attempts to make an appraisal of the expansion of ward wise urban utility facilities which are a key to the development of Kurseong town. The primary focus of the sixth chapter is on the scientific assessment of spatial concentration of the provision of infrastructural facilities and basic amenities that leads us to understand the level of development and quality of life of the town under study. The analysis is based on the primary data collected intensively through field survey by multi-stage random sampling method with household as an individual study unit as well as secondary data collected from different government offices. Geographic Information System such as GPS that provides a way to integrate the access constraints has been used to determine the geographic spread of these infrastructural facilities which will assess in the process of planning. The research hypotheses of the present study have also been tested with the application of various statistical techniques and geo-processing tools. Following URDPFI Guidelines, the service gap between the existing urban facilities and the recommended standards have been identified which will aid in curbing the unplanned development of the past on the one hand and planning for new development in an efficient manner, meeting the needs of the future on the other.

The main focus of the seventh chapter is the identification of the problems and some shortcomings on various grounds in reality which are responsible for regional disparities in terms of socio-economic infrastructure of the town. The major problems under different categories such as land use problem, problems associated with the pressure of population, socio-economic problem and environmental problem have been examined in depth focussing on the slums and squatter settlements in their dimensions and the underlying factors. The gaps between the existing land use of the town and the recommended standards as per URDPFI Guidelines have been studied for an efficient land use planning.

A detail discussion on the past and present development plans and different schemes adopted by the municipality will be dealt with in chapter eight as the preparation of development plan is a statutory requirement in any urban area before the implementation of any developed proposals. The basic concern is with the objectives of these plans, the works carried out under different schemes of the Central and the State Governments and the

satisfaction level and the existing gap between the requirement and the works undertaken in different parts of Kurseong town.

In the last ninth chapter, with a holistic approach some suggestions, possible mitigation measures and suitable proposals which can be taken into consideration for the future growth and development of the town have been presented and conclusions have been drawn.

### **1.11 Conclusion**

The present work, therefore seeks to study the spatial disparity in the level of development and quality of life in Kurseong town highlighting certain specific features of spatial variation of infrastructural facilities and the associated problems. The completion of this research work is an arduous effort of the researcher with a holistic-empirical-descriptive approach with the application of various statistical and cartographic illustrations and geo-processing tools and techniques. The findings, substantive conclusions and broad and specific generalisations drawn will definitely aid in future planning of the town under study and stimulate and instigate the future investigators to take up research work at micro level.

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