

CHAPTER - I

INTRODUCTION

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1.1 Introduction

Migration of population is a global phenomenon (Raj, 2003). It poses serious problems both for the migrants as well as the areas to which the people come and settle down (Raj, 2003). Though the migrant population has a desire to have better economic gains, their problems of adjustment, particularly in a new environment, becomes relatively difficult (Agarwal, 1973). The study of migration is therefore important for the study of population in any region. The size and structure of the population changes radically with the process of migration (Srivastava & Srivastava, 2004). It determines the size and growth of population along with its composition and structure (Roy, 2015). It also plays an important role in the distribution of the population and determines the growth of the labour force in the region. It is the symptom of basic social and economic change in the region (Srivastava & Srivastava, 2004).

The study of migration as together with fertility and mortality determines the size, distribution and growth of population along with its composition and characteristics (Hasan, 2005). Among the components of demographic studies, migration considers more interest for population geographers. Interestingly, demographers have paid more attention to this component of population change (Maurya, 2014). Population geographers have since long been concerned with the relationships between movements of people, distance and interacting areas (Wood, 1979). Along with its various demographic, social and economic effects, population geographers have also been concerned with the environmental influences upon migration streams and consequences in areas of origin and destination (Clarke, 1977).

Migration is considered as an indicator of social change (Jhingan et al., 2003). Social change is the change in social structure (Roy, 2015). Social structure is a web of social relations. Hence, social change as a change in social structure involves social relationships (Kumar, 2005). Social relationships include social processes, social patterns and social interactions (Sharma, 2007). Changes in the ratio of men and women, young and old, birth and death rates affect social relationships. Social changes accompany changes in culture (Kumar, 2005). Even changes in the quality and size of the population affect the social organisation as well as customs and traditions,

institutions, associations etc. The form of family, marriage, religion, culture, educational structure is continually changing and transforming, as a result of which, a change occurs in the life of the individual and subsequently in his relations with others (Kumar, 2009).

Sikkim is a state with a varied physical phenomenon. The geographical and climatic features of the State have extremely influenced its economic as well as social development (Debnath, 2009). Human settlements and economic activities have been built around differential topography, ecology and environmental areas (Hussain, 2002). The impact of climatic change, terrain characteristics and other factors has to be considered for the rate of migration and also for the socio-economic conditions of the migrant population (Chakraworty, 2006). Sikkim is a multi-ethnic state with a huge number of tribal populations (Gurung, 2011). For these reasons, migrants of Sikkim have a great impact on social and economic changes of the region.

1.2 Conceptual Framework

Population geography studies geographical perspective involving demographic attributes (Verma, 2008). The study of population and its various aspects such as population growth, distribution, composition, fertility, mortality and migration are important to understand the level of development in a region (Srivastava & Srivastava, 2004). The population cannot exist without a natural environment in which people live and work. An approach to the study of population is, therefore, a significant area of geographical research.

Migration is such an event in which people move from one geographical area to another geographical area (Bhende and Kanitkar, 2003). Movements of people from one place to another are determined by a variety of factors – Demographic, cultural, political, social, economic, as well as geographical. People migrate to places where there are favourable environmental conditions and economic opportunities (Donald, 1969). Similarly, people move out of the places where socio-economic, political and other environmental conditions such as natural hazards and disasters stand unfavourable (Singh, 2006).

Migration studies have recently been undertaken not only in population geography but also in different social science disciplines in various parts of the earth (Kaur, 1996). This is because an increasing migration rate has obstructed the overall

economic prosperity and has created various problems in society and the economy (Maurya, 2014). The administrator, the politician, the environmental planners, the geographer and other social scientists at large are sometimes concerned with the problems of migration that require speedy solutions (Sharma, 2012).

Migration has great importance for increase or decrease in the population size (Roy, 2015). The birth rate and death rate do not change the size and structure of the population drastically, while migration, may cause large scale changes in the size and structure of the population (Bhende and Kanitkar, 2003). The study of migration is of imperative significance because migration determines the size of the population, the growth of population and structure of population. Besides, migration has a significant value in determining the distribution of population and supply of labour force in the country. The study of migration is also useful for formulating economic and other policies by the government, economists, sociologists, politicians and planners along with demographers (Chandna, 2006).

Migration affects the place where people migrate and the place to which they migrate. Migrants have both positive and adverse effects on the society and economy (Datta, 2003). Migration studies have several administrative uses. The state also depends upon such studies for the provision of social services, health services and welfare of the people, continuance of law and so on. It is very much significant to know details of the migrant population to realize change in population and the positive or negative impact of such changes on the economy as well as human society (Adler et al., 2003).

The economic effects of migration vary in many ways. Sending countries may experience both short-term gains and losses but may stand for long-term gains. For countries, temporary programs can help address skills deficits but reduce domestic wages and add to the burden of public welfare. (Tripathi and Dash, 1997). The economic implications of migration in both sending and receiving countries depend on who is going, especially in relation to the skill level of migrant workers. (Kamble, 1983). The problem is not related with in-migration; it is mainly related with integration; especially in the labour market. If there are no works or trades, the segregation and housing problems are the main consequences (Bellampalli, 2019).

1.3 Statement of the Problem

Migration is studied in terms of the age of in-migrants and gender, as structural changes in the age of in-migrants and non-in-migrants can affect crude birth rate, crude death rate and labour force. (Chandna, 1991).

As per the 2011 census, Sikkim has lowest total numbers of population in India with a population of 610,577. Sikkim is one of the least densely populated Indian states. The population density of the state is only 86 persons per sq. km. However, its population growth rate averaged 12.36 percent between 2001 and 2011, which is quite higher (Census of India, 2011).

After 1975, when Sikkim became an integrated state of India and a huge number of resources were devoted to development, Sikkim's in-migration became even more significant. According to census data on migration, which primarily covers migration by place of birth and final residence, Sikkim recorded a very high level of in-migration that was 35% in 1981(Census of India, 1981) and it decreased by nearly 15% in 2011(Census of India, 2011). In-migration after 1975 has taken place mainly in the East and South districts of Sikkim through several entry points such as Rongpo, Jorethang, Malli, Nayabazar and Pedong (Census of India, 1981). In view of the above, these two districts have been selected for the study. Structure and socio-economic conditions of these migrant people play an important role in the population composition as well as developmental issues in Sikkim. The present study, therefore, seeks to examine the structure and socio-economic conditions of migrants in East and South districts of Sikkim and the impacts on their satisfaction level in particular. The proposed study regarding the structure and socio-economic conditions of migrants in Sikkim after 1975 has so far not been attempted. It is sincerely hoped that the same have filled up the gap for further research.

The migrant workers are too weak to revolt due to their poverty condition, illiteracy and ignorance while on the other hand, their employers are too strong and powerful to evade their obligation to exploit them. Of course, various legislative provisions exist to channelize the employment procedures, regularizing payments and working hours, preventing unfair deduction of wages, ensuring leaves, providing social security and so on. However, the perceived reality is completely different from our expectations. Several sources reveal that there are huge numbers of instances of denying the labour laws, especially for female workers (Roy, 2011).

Migrants are usually influenced by social disparity and may have a diverse range of experiences in the migration process (Davies et al., 2009) that reflect their physical, mental, social status. Therefore, it is necessary to study the perception of migrants so that migrants can have equal social value in the community. Over the last few decades, it has been observed that the number of migrants has increased significantly at the international level.

1.4 Area of study

Sikkim is located in the western-most part of the Eastern Himalayan realms within the great and the inner Himalayan region. In 1975 Sikkim was merged with Indian union as a constituent state. Sikkim lies between 27°4' to 28°7'48" North latitudes and between 88°00'58" to 88°55'25" East longitudes (Figure 1.1). The physical shape is somewhat rectangular about 113 km long and 64 km wide. It is squeezed between Nepal on the west and Bhutan on the east. On its south lies the famous hill station Darjeeling district of West Bengal and Tibet on its north (Gurung, 2011).

Sikkim is divided into four districts and nine sub-divisions. The East district has three sub-divisions and other three districts comprise two sub-divisions each. The rural areas of the whole state are divided into 163 Gram panchayat units and urban areas contain into 8 municipalities in three types which are Municipal Corporation (Gangtok), Municipal Council (Namchi), Nagar Panchayat (Singtam, Rangpo, Jorethang, Gyalsing Nayabazar and Mangan (Chhetri, 2010).

The state has a total area of 7096 sq. km which constitutes 0.22% of the total geographical area of India. The total population of Sikkim is 6,10,577 in 2011 (Census of India, 2011) which is just over .05% of the total population of India. According to Census of India, 2011 the population density of the state is 86 persons per Sq. Km. It is one of the least populous state in India and the second smallest in area. Gangtok is the capital and largest town of the state.

The East and South districts of Sikkim have been selected as an area of study. These two districts were selected on the basis of maximum numbers of migration that has taken place and recorded on the census reports published by Census of India (Census of India, 2011). These two districts have five sub-divisions. Gangtok, Pakyong and Rongli are the sub-divisions of East district and Namchi and Ravong are the sub-divisions of South district. Gangtok is the headquarter of the East district and Namchi is the headquarter of the South district.

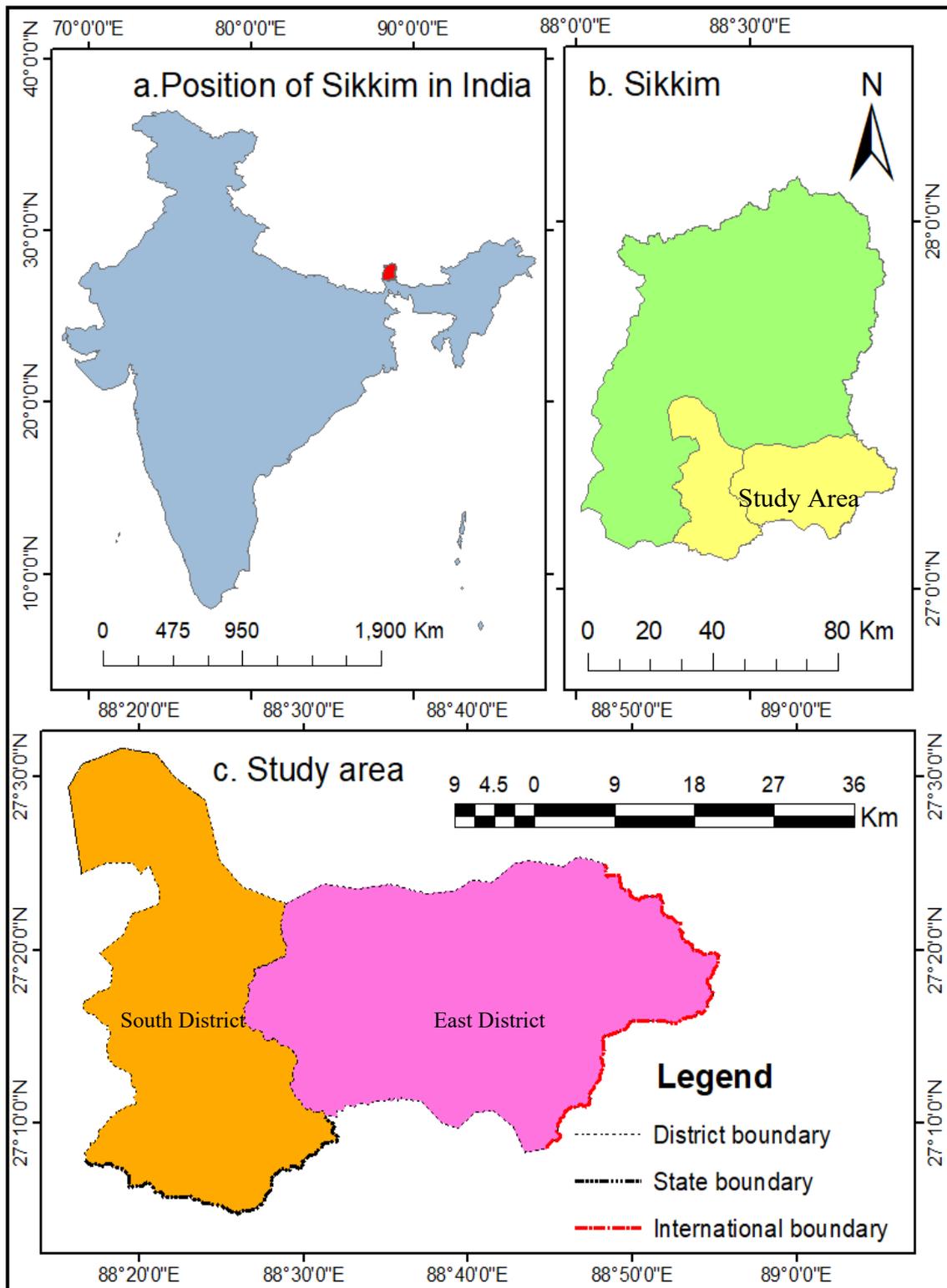


Figure: 1.1 Location map of the study area (a) India (b) Sikkim and (c) Study area (East and South districts)

The study area is bounded by the north district of Sikkim in the north; West district of Sikkim in the west; the state of West Bengal in the south and Tibet and Bhutan in the east. According to Census, 2011 total population of the study area is 430433, which is 70.50% of the total state population out of which 228102 are males and 202331 are females. The total area of the study area is 1704 sq. km. which constitute 24.01% of the total geographical area of the state. The density of the population of the study area is 253 persons per sq. km. The sex ratio of the study area is 888 females per thousand males. The study area has five urban centres, which are Gangtok, Singtam and Rongpo in the East district and Namchi and Jorethang in the South district. The study area has a total 271 numbers of villages (Census of India, 2011).

1.5 Review of Literature

In the study of population geography, the main theme is the analysis of growth, density and distribution of population along with migration and its impact on socio-economic and environmental changes and the relation with different geographical aspects like relief, vegetation, rivers, soil etc. In the review of literature many of the books, articles, theses and different web information in the field of population, as well as migration studies, have been taken into contemplation to judgment to understand the research gap in this field though there is substantial literature in this perspective.

- ❖ **Ackerman, (1959)** in his book entitled „*Geography and Demography*“ discusses that population geography is a recognized and organized branch of geography and its stress on man. Man is the heart of population study. In adding up to the insertion of men culture, economic activities and distribution over the earth at present or in the past, there exists a need for improved acceptance of spatial study of population.
- ❖ **Zelinsky, (1966)** in his book entitled „*A Prologue to Population Geography*“ describes that population is concerned with the uncomplicated account of the position of population statistics and quality. The geographical study of different phenomena of the population is interconnected with the different elements of geographical vicinity. He also discussed the population phenomenon that includes the dynamics of population distribution, density and growth, urban or rural setting, fertility, mortality, and migration; while structural characteristics

include age-sex composition, ethnicity, marital status, socio-economic composition, and religious activities of the people.

- ❖ **Trewartha, (1969)** in his book entitled „*A Geography of Population: World Pattern*“ deals with the geography of population and the different characteristics of the population. He defines that population geography is the study of human geography which is concerned with the spatial distribution on the earth surface. He argued that population and its characteristics are the key elements of geographical analysis and so, it is important for the understanding of regional differences.
- ❖ **Chandrasekhar, (1972)** in the book entitled „*Infant Mortality, Population Growth and Family Planning in India*“ deals with the population census and vital statistics in India, measurement, facts and rate of infant mortality in India and the World. He analyses the various inference of high and low infant mortality on the country’s major problems of population growth. He also recommended in his book that the functional decline in the infant mortality rate will give a lower birth rate through population policies and family planning.
- ❖ **Harrison, (1972)** in his book „*The Structure of Human Population*“ shows how national as well as international migration is gender and age selective. He discussed patterns of fertility and mortality, various mathematical models in demographic study, factors related to sex ratio and social mobility. He also discussed various population policies and their implications with family planning.
- ❖ **Sharma, (1975)** in his book entitled „*Population Trends, Resources and Environment*“ discussed the relation between population and other social aspects like resources, quality of life, education, environment etc. He points out that the creation of new resources and the rising of income and life expectancy, declining pollution, poverty and diseases are provided to human inference to lead to the future. He also points out that population changes have been constructive for all economic possessions including environmental limpidness as well as the standard of living.
- ❖ **Clarke, (1977)** in his book entitled „*Populaton Geography*“ describes that the geography of the relationship is related to the specific pattern of the problem. Discuss not only the specialties of distribution in distribution, but also the popularity of communication and the interaction with special interfaces in

specialties. Explain and analyse the relationship with the facts of physics, economics and culture. The distribution of the superficiality of the land, to the fact that the distribution of other natural resources, is intended. The distribution of public relations is related to communication, the economic and social aspects of life.

- ❖ **Garnier, (1978)** in his book entitled „*Geography of Population*“ deals with the study of geographers to illustrate the particulars in the current environmental framework and also their causes, features and probable effectiveness. In his book, the author shows that population geography is the study of geographic elucidation of demographic phenomena. These phenomena analyse the dimension and changes of population intensification and allocation of an area. He also considers that population geography has main three aspects e.g., the giving out of people over the earth, the consideration of human societies and level of achievement of the people.
- ❖ **Bhende and Kanitkar, (2003)** in their book entitled „*Principles of Population Studies*“ deals with the growth and distribution of population in the World and Indian perspectives; fertility, mortality and migration of population; population structure and characteristics and labour force of specific geographical areas. They considered that population analysis is limited to the study of population variability and the elements of change, where population studies are not only related to population variables, but also to the relationship between population change and other variables such as social, economic, political, biological, genetic and geographical.
- ❖ **Woods, (1979)** in his book „*Population Analysis in Geography*“ describes that social science has made contributions to the spatial and sequential pattern of population distribution. He analysed the main aspects of population geography like population distribution, components, growth and characteristics of human behaviour. He indicated that the central part of population studies is spatial variation in fertility, mortality and migration together. The book is significantly oriented towards the use of models in analysing human behaviour and attributes like fertility, mortality and migration.
- ❖ **Gosal, (1982)** in his book entitled „*Recent Population growth in India*“ deals with the population growth in India. The author described that also to irrigation facilities, retrieval of wastelands, development of different industries,

commercial activities and agriculture sectors are the result of the speedy increase of population in India. He also explains that population growth is mainly influenced by the insufficient education facilities and lack of women education in India.

- ❖ **Ghosh, (1985)** in his book „*Fundamentals of Population Geography*“ discussed not only the population distribution and characteristics but also its growth, pattern, fertility, mortality, mobility and migration. The author argued that population geography concerns the spatial analysis of population distribution and its characteristics. The population is related to other branches like demography, sociology, economics and other related disciplines of social science. He states that population density is the most fundamental demographic technique with which all other demographic aspects are interlinked directly or indirectly. He also states that population growth determines the population density distribution and structure and composition of the population.
- ❖ **Singh, (1986)** in his book „*Patterns of Rural-Urban Migration in India*“ describes the different prototype of national immigration and emigration in rural and urban areas in India. The author is concerned with the age-sex composition and marital status of migrants. His study on rural-urban areas concerns the rural poor, and a variety of fundamental factors of migration have surfaced in a different level of significance. The rising employment opportunities in growing cities motivate the migrants to engage in employment and other economic activity.
- ❖ **Saxena and Talwar, (1987)** in their edited book „*Recent Advances in the Techniques for Demographic Analysis*“ have discussed some multivariate and other quantitative techniques for demographic analysis like regression analysis, multiple classification analysis etc. They also analysed various techniques for fertility and mortality, including measurement of present fertility, trends in fertility and construction of life tables, estimation of infant mortality etc.
- ❖ **Jones, (1990)** in his book entitled *Population Geography*“ describes the increasing patterns of fertility, mortality and migration, the spatio-temporal processes and their interaction expressed in population growth, problems and policies. He states that the population should imitate exercise courses in pageant with the recent trends in geography with stress on population dynamics. He

initiates a discussion in his book to reorganize the notoriety in population geography.

- ❖ **Ranade, (1990)** in his book entitled „*Population Dynamics in India*“ describes the different aspects of population dynamics in India. The author discussed the spatial distribution of population with regional differences of schedule caste and scheduled tribe population in India. He also discussed growth and spatial variation of rural population and analysed the migration pattern and urbanisation processes caused by the population changes.
- ❖ **Sawant, (1994)** in his book entitled „*Population Geography*“ indicates that a transport network is indispensable to know the density of population of a region. In his book he expressed that all the issues which demarcate population geography such as the study of people with their spatial distribution and density, increase or decrease in population numbers, movement and mobility of people, occupational structures, human settlements, etc. He states that density of population helps us to comprehend the nature of population distribution.
- ❖ **Krishnan, (1997)** in his report on „*Population Geography in India*“ covers of all important aspects of the geographical population of the people has not yet increased. Potential areas of research are identified as physical and social resources in India as urban pressure and indigenous peoples as Scheduled Castes and Scheduled Tribes of India.
- ❖ **Kayastha, (1998)** pointed out that the population provides the focus to all studies; it is central to environment and development. He argued that an integrated approach to the study of population, environment and development as a whole remains a significant area and geographical research and facilitates the investigation of interlinked studies. In his book entitled „*Geography of population,*“ he discussed the environmental perception and problems; population characteristics and problems of urban and rural development related to the migration pattern. He also analysed the poverty, economy and impacts of development associated with population changes.
- ❖ **Oderth, (2002)** in his book entitled „*An Introduction to the study of Human Migration: An interdisciplinary perspectives*“ deals with the source materials for migration studies and methods for description and analysis of migration data. He also discussed the expansion of migration over the earth and states the

causes and consequences of migration over a period of time in a particular region.

- ❖ **Jhingan, Bhatt and Desai, (2003)** in their book entitled „*Demography*“ deal with the theoretical discussion of the determining factors of population growth and also analyse the relationship between population growth and economic development. They consequently describe migration, its types and causes and urbanisation, its trends and problems. They pointed out that demography is to analyse the theoretical explanation regarding various changes in population.
- ❖ **Adler and Gielen, (2003)** in their edited book „*Migration: immigration and emigration in International perspective*“ deal with the pattern of human migration and psychological factors of immigration and emigration. This book also concerns the immigration and emigration which are related to the United States, migration in Columbia, migrants‘ families in Germany, migration processes in Poland, psychological adjustment and migration in Norway, migration from and to Japan, migration to Australia and the book also describes the migration in South Africa.
- ❖ **Datta, (2003)** in his book entitled „*Human Migration: A Social Phenomena*“ opines that human migration is one of the most important aspects of social science. He argued that the migration process had been an important factor in the area of development and changes in present-day society. It is a complex process and is indicative of basic social and economic changes. In his book, he discussed a brief description of North Bengal and also described the study of forest villages and artisans‘ colonies in North Bengal.
- ❖ **Husain, (2004)** in his book „*Human Geography*“ points out that the causes of migration may be due to a variety of factors and these may range from natural calamities, climatic change, epidemics, drought to social, economic, cultural and political aspects. He emphasizes that the role of overpopulation and heavy stress on resources may be the causes of stable or momentary migration and also rural or urban relocation.
- ❖ **Hassan, (2005)** in his book entitled „*Population Geography*“ deals with the spatial analysis of the components of population changes and its attributes. In addition, with this interrelationship between population growth and food supply and environmental quality has also been described. He pointed out that population geography, as an independent subfield of human geography.

- ❖ **Chandna, (2006)** in his book „*Geography of Population*“ analyses the study of population and distribution pattern of India’s population. He points out the conceptual framework and historical development of population studies. He discussed spatial disparities in the population distribution and also highlights population characteristics, changes, and structure. He also discussed the migration of population studies along with a certain weakness in respect to population studies. The author also describes density and distribution of population and different demographic momentum.
- ❖ **Mukhrjee, (2006)** in his book entitled „*Migration and Urban Decay: Asian experiences*“ describes the crucial urban crisis and decay in Asia, due to extensive migration, urban explosion and overstrained urban services. This book deals with the massive poverty-induced migration and spatial-economic-political processes behind such migration and urban decay in developing countries.
- ❖ **Singh, (2006)** in his edited book entitled „*Population Geography*“ described that population spatial distribution is significantly important because man has brought significant changes over the earth surface. He also analyses the population redistribution through international and internal migration and its existing trends. He was concerned with the structure of socio-spatial distribution of population as well as migrant population in a particular area or in a specific country.
- ❖ **Mandal, Uyanga and Prasad, (2007)** in their book entitled „*Introductory Methods in Population Analysis*“ stated that statistics are essential to show the evolution of population over time and space. According to the international treaty, the census is a specific time count of the people at a particular time and the specific characteristics of each person. i. e. Information on the number of persons in each subdivision of each region, such as age, gender and marital status, shows the geographical distribution of the population. Demographic geography is a newly developed branch of geography. As the population of time and space grows, today the world's population explosion is adding millions of people every year. Not only sound education but his alertness and dedication too are most required.
- ❖ **Kundu, Amitabh and Niranjana, (2007)** in the article titled „*Migration, Employment Status and Poverty*“ analyse the outline of both male and female

migration in urban areas and its socio-economic relationship and also consider the different causes of urban immigration and recommend that the possibility amongst the migrants compared to the local population in all dimension of different urban areas.

- ❖ **Tripathi, (2008)** in his book entitled „*Population Geography*“ describes the socio-economic profile of the Scheduled Caste population in India. He discussed that there is an increase in urban Scheduled Caste population due to the industrialisation and modernization. It has been found that the decadal growth rate of scheduled caste has been more than that of the general population. He also discussed the different structure and composition of the Scheduled Caste population in India.
- ❖ **Doniwal, (2008)** argued in his book entitled „*Population Geography*“ deals with the demographic transition of population including fertility transition; population growth in India; population structure and composition; fertility and mortality; causes and consequences of international migration; health status, poverty and environment of population and also discussed different challenges, social development and security of demographic phenomenon.
- ❖ **Verma, (2008)** in his book entitled „*Human Geography*“ concentrates on the field of human geography within its folds such fields as cultural, population, historical, political, economic and urban geography. The book explores this field in detail, discussing its sub-fields, the range and scopes, the techniques and methodology of the study, the contemporary relevance of the field, as well as what it holds for the future.
- ❖ **Chandra, (2008)** in his book entitled „*Population Challenge and World Crisis*“ describes the pattern and distribution of World population. The author also discussed positive and negative growth rates of population in different parts of the World and population dynamics in different parts of the World. He pointed out the recent trends in World population, World population crisis, World population challenges including contemporary population challenges and also discussed the biological evolution of population and population genetics in brief.
- ❖ **Anwaruzzaman, (2009)** in the article entitled „*Immigration in Jalpaiguri, West Bengal: Nature, Trends and Consequences*“ show how the region attracts migrants from both national and international areas. The researcher indicates

that the district has 7 stages of immigration ranging from colonial period to post Pakistan-Bangladesh war in 1971. These stages comprised refugees of Tibet and Bangladesh; emigrants from Assam, Nepal and Bhutan. He said that the economic prosperity along tea gardens, transport facilities, fertile land and low rate of living standard are the major reasons for immigration in the district. He also shows that the uncontrolled immigration in the district has destroyed the natural environment and depleted biodiversity at an alarming rate. The immigration has also resulted in the formation of movements of different social immigrant groups for their rights on land and resources.

- ❖ **Newbold, (2010)** in his book entitled „*Population Geography: Tools and Issues*“ discussed population aspects such as fertility, mortality and migration. He argued that how population growth is concerned with economic development, resource scarcity and food security. He also attempts for efficient tools for relating and measuring population processes, population data and population composition. He focuses on detailed features of population as well as population geographical research.
- ❖ **Samers, (2010)** in his book entitled „*Migration*“ describes the geography of migration in the world and the migration across the international borders. He also points out that the geopolitical economy of migration control and citizenship belonging to migration. He discussed the theories, concepts and issues concerning migration and immigration. He argued that in the context of migration, spatially-explicit concepts like transnationalism need more gradation.
- ❖ **Rajan, (2010)** in his edited book „*Migration, Identity and Conflict: India Migration Report*“ describes the internal migration of India including rural and urban migration with district-level analysis. In this book magnitudes of migration in the north-east Indian region also are discussed. The book concerns the political conflicts related to migration and discusses the relation between migration with caste, ethnicity, employment and gender issues in India.
- ❖ **Paul, (2011)** in her book entitled „*A Handbook of Demography*“ examines the fundamentals of population phenomena. This book deals with population growth and its factors, the role of population in economic development, theoretical perspectives and general concepts of demography. She also describes the different structure and composition of the population, different measures of demography and different theoretical orientation of population.

- ❖ **Singh, (2011)** in her edited book „*Human Geography: Concept and Issues*“ describes different conceptual views on human geography including population, behaviour, cultural ecology, politics, health, food, environment, region, economy, feminism concept in human geography and many other attributes related to human geography. She also deals with the urban and rural geographical attributes of population and its impact on economy and society. Editor especially discusses the concept and issues related to human migration. In her book, she pointed out the pre-modern and modern migration, migration and its relation to the climate cycle. Singh has discussed different causes of migration including push and pull factors such as emigration, immigration, free migration, great migration, illegal migration, migration pattern in India in modern period and many other theoretical views on migration in her book.
- ❖ **Sharma, (2012)** in his book entitled „*Population and Society*“ deals with the sociological theories of population and sociological concepts relevant to the study of population. He pointed out that the study of the population has complied with different disciplines like sociology, economics, psychology, geography, mathematics and so many other disciplines.
- ❖ **Singh, (2012)** argued that geography is the study of features of earth's surface including their spatial distribution and its interaction with man. He said that human geography is the synthetic study of the relationship between human societies and the environment and it's also the study of man's reciprocal relationship with his environment. In his book entitled „*A Text Book on Human Geography*,“ he describes the approaches to the study of human geography, the primitive lifestyle of mankind and subsequently migration; spatial distribution of mankind and human adaptation to the environment and also discussed the economic activities of mankind.
- ❖ **Dasgupta, (2012)** in his book entitled „*Social Demography*“ social population parameters are very nicely defined to include the relationship of population to society, population policy, social institutions, social factors influencing public change, social change, population policy and population problems and solutions. He also describes migration, its concept, factors, different models regarding migration, different types of migration and describes the various social, biological and economic consequences of migration.

- ❖ **Qazi and Qazi, (2013)** in their book entitled „*Population Geography*“ described the different concept of population geography, distribution and density of population in the World with the factors affecting the population distribution including geographical, cultural and demographic factors. They also pointed out the spatial movement of the population including classification, forces, volume and consequences of migration and the characteristics of migrants. They also discussed the growth of population including birth and death rates, pattern of population composition including age structure, sex composition, racial and ethnic composition, religious composition, linguistic composition, educational composition etc. In their book, they described the rural-urban composition of population, economical traits of population, relationship between population and resources and emphasized geographical overview of World population.

1.5.1 Review of Literature on Sikkim

- ❖ **Risley, (1894)** „*The Gazetteer of Sikkim*“; is one of the oldest books on Sikkim. Which deals with all the aspects of society, culture, a religious custom, demographic structure, political development, flora and fauna, etc. of Sikkim? To some extent, his writing also helps to provide some precious information about population data especially in and out-migration of Sikkim.
- ❖ **Bhattacharyya, (1984)** in his book entitled „*Aspect of Cultural History of Sikkim*“ described the historical background, geographical features, demographic structure, culture and social way of life of the people of Sikkim. He shows that Lepchas were initially the only inhabitants of Sikkim. Along with the Lepchas, the population of Sikkim is largely composed of Bhutias and Nepali. Most of the Bhutias settled in Sikkim are immigrants from Tibet and Bhutan during the 17th century. He points out that the Nepali immigrants now far outnumber the Bhutias or the Lepchas.
- ❖ **Barua, (1987)** in her article entitled „*Migration and Human Settlements in the Rangit Basin (Sikkim-Darjeeling Himalaya)*“ discussed migrants‘ population who move for better opportunities. She states that the Rangit basin in the Sikkim-Darjeeling Himalaya is composed of three primary ethnic groups namely Lepchas, Bhutias and Nepali. Though Lepchas are indigenous people in this area, due to intensive immigration from Tibet and Nepal, nowadays

Lepchas are a minority in the region. Excessive Nepali immigration created a Diasporas situation, by which Nepali are the dominant community in the basin.

- ❖ **Boot, (1991)** in the article entitled “*Migration Pattern in the Urban Areas of Sikkim*” describes migration patterns in the urban areas of Sikkim in detail. He states that urban population structure of Sikkim mainly depends on this migration process and migration is chief influencing factors for the spatial variation of urban population in the urban areas of Sikkim. He argued that present urban population structure increases the total population with a complex population structure in the urban areas of Sikkim. He examines that after 1975 when Sikkim was merged with India as a constituent state, migration occurred due to employment for male and marriage for females from the different neighbouring states of India like West Bengal, Bihar, Assam, Uttar Pradesh etc. He points out that small towns like ‘_Nagar Panchayat’ are the result of these immigration activities.
- ❖ **Sharma, (1991)** in the article entitled “*Migration and Distribution of Plainsmen in Sikkim* ” gives a detailed account about the spatial distribution of the migrant plainsmen in Sikkim and reasons for their migration. He classifies the ethnic group of Sikkim into two distinct categories; one is migrated and another is non-migrated. The Lepchas are considered as the indigenous people of Sikkim and others considered as migrants. The migrants in Sikkim include Bhutia, Nepali and Plainsmen like ‘_Marrwaris’, ‘_Bharis’, ‘_Bengalees’ who migrated from the plains of India after 1975. He states that the migrated Plainsmen are not only found in the major towns of Sikkim but also in the small towns and in the rural areas of Sikkim too.
- ❖ **Lama, (1994)** in his edited book „*Sikkim: Society, Polity, Economy, Environment*” describes the Bhutia-Lepcha women in Sikkim, occupational structure of plainsmen in Sikkim and ethnicity and resource management. He also discussed agriculture, energy consumption, development of tourism and the geo-ecological system of Sikkim. He opines that the Sikkim has potential population resources for the developmental strategies.
- ❖ **Datta, (1997)** in her article entitled „*Inter-Ethnic Relations in Sikkim in Historical Perspective*” describes the demographic profile of the different ethnic groups of Sikkim including the Lepcha, Bhutia and Nepalis of Sikkim. She also gives the statistical analysis of the population of Sikkim with the study of

Sikkim Census Report from 1891 to 1991. She shows how the population of non-tribal groups progressively increased with successive years and they became dominant in the population structure of Sikkim.

- ❖ **Mondal, (2000)** in the article entitled „*Muslims of Sikkim*“ argued that Muslims constitute a small cultural minority in Sikkim and they are unevenly distributed over the state. He said that the Muslims community constitute the fourth religious group after Hindus, Buddhists and Christians. He gives a detailed account about Muslim population of Sikkim and their socio-cultural profile. He also discussed history, economy and society of Muslims as well as their interactions with the Sikkimese society.
- ❖ **Poddar, (2001)** in the article entitled „*Population Dynamics of Sikkim: An observation from Census 2001*“ gives a brief account of the structure and dynamics of the population in Sikkim. He also discusses the Schedule Caste and Scheduled Tribe population distribution in all the districts of Sikkim, male-female ratio in the rural and urban areas and decadal variation of population in Sikkim and also discussed the population density distribution, literacy and other issues in the State.
- ❖ **Gulia, (2005)** in his book entitled „*Human Ecology of Sikkim*“ describes the terrain profile and geographical mosaic of Sikkim. He analyses the realms of spiritual ecology in the upper Rangit basin and also discusses the different aspects of cultural ecology of the upper Rangit basin. He highlights the human ecology of eco-tourism in the upper Rangit basin.
- ❖ **Choudhury, (2006)** in her book entitled „*Sikkim: Geographical Perspectives*“ discussed a detailed account of Sikkim about physical set up, demographic structure, ethnicity culture, urbanization, tourism, economic infrastructure etc. She also discussed the human growth in Sikkim in respect of education, health and employment opportunities. The main features of this book are the socio-economic condition and lifestyle of the people of Sikkim.
- ❖ **Subba, (2009)** in his edited book „*Mythology of the People of Sikkim*“ describes the mythological structure of different ethnic community living in Sikkim like Christians, Buddhist, Islam and others. He attempts to analyse the linkage between different religion groups of Sikkim and their livelihood. He also deals with the spiritual activities among the different ethnic groups in Sikkim.

1.6 Rationality of the study

A lot of research works have been done in different areas of the population. It is clear from the review of literature and other related studies that enough research work has not been done on different issues of migrant population of Sikkim such as population growth, density, distribution, sex ratio, literacy, occupational structure, fertility, mortality, etc. Major studies have however been attempted on population characteristics of the state only. But no study has yet been done on the migrant population of the state. The present work has primarily been a modest attempt to focus on the problems related to migration. The study has covered the population structure of migrants and their socio-economic conditions which have a definite impact on the social and economic changes of Sikkim from a geographical perspective. This research work will help in finding viable solutions for the problems of development in the state.

1.7 Research Objectives

The present study has the following objectives –

1. To analyse the factors and pattern of the migrant population after 1975 in the study area.
2. To measure the structure and composition of the migrant population in the study area.
3. To evaluate the socio-economic conditions of the migrant people in the study area.
4. To analyse the satisfaction levels of the in-migrants in the study area.

1.8 Hypotheses

The present study tries to assert the truth or falsity of the following research hypotheses:

1. There is no significant mean difference between Social status and economic status of in-migrants in the area of destination.
2. The socio-economic status of migrants is not dependent on demographic characteristics in the area of destination.
3. There is no significant relationship in satisfaction levels of in-migrants in the area of destination.
4. The satisfaction level of in-migrants is not dependent on demographic characteristics in the area of destination.

1.9 Database and Methodology

The researcher has adopted some methodologies for the present study to justify the objectives of the study and for the testing of the hypotheses mentioned above. The present study is rationalistic one, which is based on both qualitative and quantitative methods depending upon both primary and secondary data sources.

1.9.1 Sources of data

Both qualitative and quantitative data and information have been collected from different primary and secondary sources and also have been analysed, examined and represented both graphically and statistically.

1.9.1.1 Secondary Sources of data

The present chapter is mainly based on secondary data, which have been collected from the different websites and reports published by the different departments of Government of Sikkim and Government of India. Physiographic and drainage maps have been prepared from DEM, downloaded from United States Geological Society (<https://earthexplorer.usgs.gov/>). Geology and rocks and minerals were collected from the Geological Survey of India, Sikkim division. The road transport network of the study area was digitized from Google Earth. Soil map was collected from the National resource Atlas of Sikkim. Vegetation cover map has been prepared using NDVI from Landsat 8. ArcGIS 10.3 and Global mapper 25 have been used.

Socio-cultural attributes such as population, decadal changes, density, distribution of scheduled caste and scheduled tribe population, sex ratio, literacy rate, distribution of workers and non-workers were collected from the report on District census handbook, 2011 (Census of India, 2011) and Department of Economics, Monitoring and Evaluation, Government of Sikkim (DESME, Govt. of Sikkim, 2018). Health related data were collected from the website of the Department of Health, Government of Sikkim (Govt. of Sikkim, 2018). Land use pattern of Sikkim has been collected from Human development report, 2001 (Govt. of Sikkim, 2013) and statistical profile of Sikkim, 2006-07 (DESME, 2018). Distribution of minerals was collected from the report published by the G.S.I. of Sikkim (ENVIS, 2018). Cropping pattern, district-wise agricultural area, production and yield has been collected from Department of food security and agriculture development department, Government of Sikkim (Govt. of Sikkim, 2018). The large, small and micro industries related data have been collected from the annual reports, published by the Ministry of MSME,

Government of Sikkim (DCMSME, 2018). The energy production and distribution were collected from the Sikkim energy and power department, Government of Sikkim (ENVIS, 2018). Data regarding the numbers of domestic and foreign tourists visited the state during 2011-2017 has been collected from the Tourism and civil aviation department, Government of Sikkim (Department of Tourism, Govt. of Sikkim, 2018). The suitable statistical techniques have been used in SPSS 26.

1.9.1.2 Primary sources of data

Primary data has also been used to conduct this study. These data were collected through a household survey with the help of a structured questionnaire (Appendix A) during November, 2017 to April 2018. A stratified random sampling design without replacement based on strata of urban and rural areas was adopted for the household survey and a significant number of 340 migrants (a total 190 households were selected from the East district of Sikkim and a total 150 households were selected from the South district of Sikkim) households were interviewed. Key informant interviews and non-participant observation techniques were used to measure the socio-economic conditions and perception of the level of satisfaction (qualitative data) of migrants. A pilot survey was conducted in the study area before the finalization of the structured questionnaire.

1.9.1.3 Sample design

Sample respondents among the migrants of the area for this study are belonging to the age group 18 to 60 years which have been considered as the working population. Among the four districts of Sikkim two districts namely East and South districts have been selected as an area of study. These two districts were selected on the basis of maximum numbers of migration in a particular time period that has taken place and recorded in the census reports published by Census of India. These two districts have five sub-divisions. Gangtok, Pakyong and Rongli are the sub-divisions of East district and Namchi and Ravong are the sub-divisions of South district. All five sub-divisions were selected for the collection of sample respondents to conduct this study. From these five sub-divisions, 5 urban areas and 4 rural areas have been chosen using the stratified random sample based on the maximum number of in-migrants recorded in the census report. From the East district, 3 urban areas namely; Gangtok, Singtham and Rongpo have been chosen, whereas, from the South district, 2 urban areas namely, Namchi and Jorthing have been chosen for the collection of sample data of migrants. Other than

these urban areas, 2 rural areas from each district have been chosen, which are Pakyong and Rongli from East district and Ravangla and Sumbuk from South district. The sample respondents among the migrants of the study area have been marked out with the help of Stratified random without replacement along with Non-proportional in numbers, which is based on migrants' workplace i.e., urban and Rural.

The last unit of the sample design has been considered a computer based random table. Primary data were collected from 340 migrants' respondents of East and South districts of Sikkim. As many as 190 samples were collected from the East district and 150 samples were collected from the South district.

Table 1.1 Model of Sample design

District	Sub-divisions	C.D. Block	Area category	Number of samples
East District	Gangtok	Gangtok	Urabn	50
		Singtham	Urabn	40
		Rongpo	Urabn	40
	Pakyong	Pakyong	Rural	30
	Rongli	Rongli	Rural	30
South District	Namchi	Namchi	Urabn	50
		Jorethang	Urabn	40
		Sambuk	Rural	30
	Ravong	Ravangla	Rural	30
Total No. of samples = 340				

1.9.1.4 Sample Size

The sample is the subgroup of the population (Sekaran & Bougie, 2010). Theoretically, there are various methods for determining the sample size in social science for a particular area. For measuring the sample size, five respondents have been selected per parameter to be analysed as lower limit (Hair et al., 2010), but most of the scholars accepted that the proportion among the respondents and parameter should be 10:1 (Schreiber et al., 2006). In other methods regarding measuring of the sample size it has been observed that the sample sizes of not less than 30 and not more than 500 are appropriate for the study (Roscoe, 1975).

However, for the present study, the sample size according to the parameter-based method, has been selected. Thus, the parameters of the study have been categorized into two categories, which are i) Parameters for Socio-economic conditions of the migrants and ii) parameters for level of satisfaction of the migrants. These parameters are listed below:

Table 1.2 List of parameters for the study

Socio-economic Conditions		Level of Satisfaction			
Sl. No.	Parameters	Sl. No.	Parameters	Sl. No.	Parameters
1	Health	7	Job	13	Calmness
2	Education	8	Remittance	14	Blueness
3	Demography	9	Savings	15	Cheerless
4	Income	10	Health	16	Nervousness
5	Savings	11	Sleep	17	Adaptation
6	Loan	12	Happiness	18	Willingness

There are 18 parameters that have been chosen for the study. According to parameter-based methods, the appropriate proportion for the sample respondents as per parameter is 10:1 ratio (10 respondents for one parameter). But the parameter-based method for determining sample size is not universally accepted as the number of respondents is the proportionate to the number of parameters.

Therefore, a more appropriate method for determining the sample size for the study has been considered here. This method is known as precision at 95% Confidence Interval (CI). This method can be analysed in two ways, which are i) one-tailed test and ii) two-tailed test. These two methods are also categorized a) known population size and b) unknown population size (Almeda et al., 2010). Here the researcher has considered the population size of the total migrant population in the study area as unknown. It is because the figure relating to the total migrant population in the study area was obtained from the field survey conducted during the year 2017-2018. However, the present study does not relate to the Census report in the year 2011 which reveals the total migrants' population in the study area.

Based on the precision-based method for two-tailed of unknown population size (Cochran, 1963) researcher considered the sample size for the present study. According

to W.G. Cochran Precision method for determining the sample of the study is formulated as:

For the two-tailed test of unknown population size

$$n = \frac{z^2 pq}{e^2} \dots\dots\dots 1.1$$

Where, n = Sample size

z = z value found in the z table at a given confidence level

p = estimated proportion of an attribute that is present in the population

q = 1 – p

e = desired level of precision

$$n = \frac{1.96^2 \times 0.33 \times 0.67}{0.05^2} \dots\dots\dots 1.2$$

= 339.75 (Minimum sample size =340)

As regards the minimum number of sample villages to be covered under the study, among all the observations pertaining to a variable, lowest prevalence was anticipated as 40%. Accordingly taking into account 33% relative precision, required minimum sample size came to be 340 at 95% level of confidence. These 340 samples give a N/n ratio of 0.1 as n i.e., total number of in-migrants‘ households are estimated to be more than 3400. So, for individual village level 10 percent of total households were surveyed. The respondents were randomly chosen using the random walk principle. Since the East district of the state is more populous in terms of total population and total migrants than the South district of the state and East district has three sub-divisions along with four urban centres, South district has two sub-divisions along with two urban centres. Therefore 190 sample respondents were collected from the East district of the state and 150 sample respondents were collected from the South district of the state. Sample size for the study has been collected on the basis of strata. These strata are mainly based on variables of workplace and residence i.e., urban or rural.

1.9.2 Tools and Techniques

The data and information have been processed and represented with various tools and techniques. Different methods have been used for the study. The migration rate of the study area has been measured by the Migration rate method, (Jhingan et al., 2003), in migration rate method, out migration rate method, net migration rate method and gross migration rate method (Srivastava and Srivastava, 2004). Data on structure

and socio-economic conditions of the in-migrant population of the study area have been analyzed with the help of various statistical tools and indices. Different cartographic techniques have been used for the present study. Statistical Package for the Social Sciences (SPSS version 26.0) has been used for the analysis of statistical data, ArcGIS software version 10.3 has been used for the preparation of different maps to fulfil the present study.

To find out the distribution tendency of Schedule Caste and Scheduled Tribe population of Sikkim, distribution of workers (main and marginal) and non-workers of Sikkim and the study area, categories of workers of the study area and Sikkim state following formula has been used.

$$\frac{\text{Part population}}{\text{Total Population}} \times 100 \dots \dots \dots 1.3$$

1.9.2.1 Decadal changes

To find out decadal changes of population of the study area and Sikkim state, formula for decadal variation has been used by using the total population of the present decade and past decade (Srivastava and Srivastava, 2004).

$$Di = \frac{Pi - P}{P} \times 100 \dots \dots \dots 1.4$$

- Where, Di = Decadal variation of population
- Pi = Total population of present decade
- P = Total population of past decade

1.9.2.2 Literacy rate

To find out literacy rate, there are two methods or indices of literacy such as i) Crude literacy rate and ii) Effective literacy rate. Both have been used in measuring the level of literacy (Maurya, 2014):

To find out the Crude literacy rate (CLR) following formula has been used.

$$CLR = \frac{\text{Literate population}}{\text{Total population}} \times 100 \dots \dots \dots 1.5$$

Here effective literacy rate is used to find out the level of literacy of the state and the study area, where children upto the age of 7 years is not included in the total population of the area. Effective literacy rate is calculated by the following formula:

$$\text{Effective Literacy Rate} = \frac{\text{Number of literates}}{\text{Total population above 7 years of age}} \times 100 \dots \dots 1.6$$

1.9.2.3 Health

For the discussion of health conditions of the study area as well as the state of Sikkim, availability of health institutions, availability of beds in the health institutions and availability of doctors in the area have been taken into consideration. The following formula is adopted to find out the availability of health institutions, availability of beds in the health institutions and availability of doctors per 10000 thousand population of the area.

$$\text{Health} \frac{\text{institutions}}{10000} \text{population} = \frac{\text{Total number of health institutions}}{\text{Total population}} \times 10000 \dots\dots 1.7$$

$$\text{Beds}/1000 \text{ population} = \frac{\text{Total number of beds in health institutions}}{\text{Total population}} \times 10000 \dots\dots 1.8$$

$$\text{Number of doctors}/10000 \text{ population} = \frac{\text{Total number doctors}}{\text{Total population}} \times 10000 \dots\dots 1.9$$

1.9.2.4 Crop combination

Crop combination of the East and South districts of Sikkim has been prepared with the help of statistical technique used by Weaver in 1954. Total harvested land occupied by each crop in the area is taken into consideration. The actual percentage of area under each crop, which occupies more than 1 percent of the total cropping area has been computed to determine the crop combination of the study area (Weaver, 1954). The theoretical measurement for the crop combination was employed as follows:

- Monoculture = 100 percent of the total cropland for one crop
- Two crop combination = 50 percent in each crop for two crops
- Three crop combination = 33.33 percent in each crop for three crops
- Four crop combination = 25 percent in each crop for four crops
- Five crop combination = 20 percent in each crop for five crops

After the calculation of the combination of crops, determining the minimum value of the crop combination using the method of standard deviation (SD) as follows (Weaver, 1954):

$$SD = \frac{\sum d^2}{n} \dots\dots\dots 1.10$$

Where, d = Difference between the percentage of theoretical value and percentage of actual harvested area of cropland

n = total number of crops in a given combination

1.9.2.5 Annual growth rate

The annual growth rate of domestic and foreign tourists is taken into consideration to determine the aspects of tourism in Sikkim, which is one of the main bases of the state's economy. The annual growth rate of tourists during 2011-2017 is calculated by the following formula (Srivastava and Srivastava, 2004):

$$G_i = \frac{T_i - T}{T} \times 100 \dots\dots\dots 1.11$$

Where, G_i = Annual growth rate of tourists

T_i = Total tourists visited in the present year

T = Total tourists visited in last year

1.9.2.6 In Migration Rate (IMR) Method

In migration rate has been measured by the following formula (Srivastava and Srivastava, 2004):

$$IR = \frac{IM_n}{P_n} \times 1000 \dots\dots\dots 1.12$$

Where, IR = In migration rate

IM_n = *The number of in – migrants to an area in given year*

P_n = *Mid year population in the area*

1.9.2.7 Out Migration Rate (OMR) method

Out-migration rate has been measured by the following formula (Srivastava and Srivastava, 2004)::

$$OR = \frac{OM_n}{P_n} \times 1000 \dots\dots\dots 1.13$$

Where, OR = Out migration rate

OM_n = *The number of in – migrants to an area in a given year*

P_n = *Mid year population in the area*

1.9.2.8 Net Migration Rate (NMR) method

Net migration rate has been measured by the following formula (Srivastava and Srivastava, 2004):

$$NMR = \frac{IM - OM}{P_n} \times 1000 \dots\dots\dots 1.14$$

Where NMR = Net migration rate

IM = Number of in-migrants in a particular year

OM = Number of Out-migrants in a particular year

P_n = Mid year population in the area

1.9.2.9 Gross Migration Rate (GMR) method

Gross migration rate has been measured by the following formula (Srivastava and Srivastava, 2004):

$$GMR = \frac{IM + OM}{P_n} \times 1000 \dots \dots \dots 1.15$$

Where, GMR = Gross migration rate

IM = Number of in-migrants in a particular year

OM = Number of Out-migrants in a particular year

P_n = Mid year population in the area

1.9.2.10 Socioeconomic Index (SEI):

The index used to calculate the socio-economic status is called socioeconomic index. A socio-economic index is the aggregate result of social index and economic index (Maity et al., 2014). The socio-economic index is to be developed by the following formula (Maity et al., 2014):

$$Socio\ economic\ index\ (SEI) \left(\frac{1}{2} \times Social\ Index \right) + \left(\frac{1}{2} \times Economic\ Index \right) \dots \dots \dots 1.16$$

1.9.2.11 Social Index (SI):

The social indicator is influenced by factors that affect the social position of the individual or family such as health factor, demographic factor and educational factor. So, the social index is the summing up of the health index, demographic index and educational index. Socio index is to be developed by the following formula (Maity et al., 2014):

$$Social\ Index\ (SI) = \left(\frac{1}{3} \times Health\ Index \right) + \left(\frac{1}{3} \times Educational\ Index \right) + \left(\frac{1}{3} \times Demographic\ Index \right) \dots \dots \dots 1.17$$

1.9.2.12 Health Index (HI):

Health status is investigated by using a self-developed dimension index, called Health Index. To keep this in mind, five important variables were considered for constructing the health index. The outcomes of the variables are binary. Variables with their

category and codes are considered for preparing health index that is given below (Maity et al., 2014):

Table 1.3 Health-Related Variable with their Category and Code

Variables	Category	Code	Category	Code
Drinking water facility	Yes	1	No	0
Sanitation facility	Yes	1	No	0
Garbage facility	Yes	1	No	0
Sewerage facility	Yes	1	No	0
Health insurance facility	Yes	1	No	0

After getting the values for those variables, health index can be constructed using the following formula:

$$Health\ Index\ (HI) = \frac{Actual\ value - Minimum\ value}{Maximum\ value - Minimum\ value} \dots\dots\dots 1.18$$

1.9.2.13 Education Index:

Educational status is measured by using the literacy status measured in terms of years of schooling attained by the respondents. For those respondents who do not attain school or any other kind of formal training on education, are given a score ‘0’ and for others assign a score according to their years spent in school with a minimum score of one year. To create the Education Index, first respondents ‘educations are categorized based on their highest academic achievement. The value is assigned to 6 sections ranged 0-16 (Maity et al., 2014).

Table 1.4 Educational Category and Code

Category	Code
No formal education	0
Primary education	5
High school education	10
Technical Education	13
Graduation	15
Professional education	16

The following formula was used to construct the educational index of the respondent from their values generated from the education level.

$$Educational\ Index\ (EDI) = \frac{Actual\ years\ of\ schooling\ of\ the\ respondents}{Maximum\ years\ of\ schooling} \dots\dots 1.19$$

1.9.2.14 Demographic Index (DI):

A demographic index developed on the basis of family size of the respondents. Family size indicates the total number of family members in an individual household.

The following formula was used to construct the demographic index of the respondent from their size of the family (Maity et al., 2014).

$$\text{Demographic Index (DI)} = \frac{\text{Actual value} - \text{Minimum value}}{\text{Maximum value} - \text{Minimum value}} \dots \dots \dots 1.20$$

1.9.2.15 Economic Index (EI):

For determining the Economic Status of migrants of the East and South districts of Sikkim a Dimension Index has been framed up where savings by the earners and loan borrowers among the migrants have been considered with the monthly income instead of respondents' individual income to avoid the biasness because all the respondents of the study area are not living in the same livelihood although, they have same monthly income. In the study area, it is also observed that migrants' economic status is below average and they do not enjoy a far higher standard of living due to savings of money and getting loans for family members of households. That is why it is decided to make savings and loans along with monthly income of the respondents (Maity et al., 2014).

Table 1.5 Economic Variables with Category and Code

Variables	Category	Code
Savings	Yes	1
	No	0
Loan	Yes	0
	No	1

1.9.2.16 Income Index (INI):

Income index of the present study is purely based on the monthly income of the migrants in the study area. Highest and lowest monthly income of the respondents vary between Rs. 100000/- and Rs. 2000/- respectively. Following formula used to develop income index (Maity et al., 2014):

$$\text{Income Index (INI)} = \frac{\text{Actual value} - \text{Minimum value}}{\text{Maximum value} - \text{Minimum value}} \dots \dots \dots 1.21$$

After getting the income index value, it summing up with the binary value of savings and loan. For the construct the economic index this summing up values of individual respondents is calculated by the following formula:

$$\text{Economic Index (EI)} = \frac{\text{Actual value} - \text{Minimum value}}{\text{Maximum value} - \text{Minimum value}} \dots \dots \dots 1.22$$

1.9.2.17 Likert scale

American psychologist Likert formulated the method of attitude measurement in 1932. He argued that the attitude of a person varies along a dimension from negative to positive. He stated the five-point scale to measure attitude, which is a quality data of behaviour of human beings. This five-point scale is carried out with following manner:

Table 1.6 Five-point scales postulated by Likert, 1932

1	Strongly disagree	More Negative
2	Disagree	Negative
3	Undecided	Neutral
4	Agree	Positive
5	Strongly agree	More Positive

Source: Based on Lensis Likert, 1932

Level of satisfaction of the migrants in the study area has been measured with the help of Likert’s five-point scale. It helps to measure the qualitative data of the migrants statistically. Satisfaction level of migrants of the East and South districts of Sikkim has been categorised by the Likert’s five-point scale in the following manner:

Table 1.7 Five-point scales for measuring the satisfaction level of the migrants in the study area after Johns, 2010

1	Very dissatisfied	More Negative
2	Dissatisfied	Negative
3	Neutral	Neutral
4	Satisfied	Positive
5	Very satisfied	More Positive

Source: Prepared by the researcher

Table 1.8 Five-point scales on time bindings for measuring the satisfaction level of the migrants in the study area, 2018

1	None of the time	More Negative
2	Little of the time	Negative
3	Some of the time	Neutral
4	More of the time	Positive
5	All of the time	More Positive

Source: Prepared by the researcher

1.9.2.18 Cronbach's Alpha reliability test

The majority of investigators used the Likert's scale to analyse the continuity of the data or the compatibility of the data (Glim and Glim, 2003). The alpha of Cronbach was adopted by many investigators as a means of interdependence of internship. The consistency between the refinement of the level of interrelationship between the items, while the homogeneity refers to the grades of a conjunction of the items (Green et al., 1977). The formula for Alpha given by Cronbach is shown below (Cronbach, 1951):

$$\alpha = \frac{n}{n - 1} \left(1 - \frac{i \sum V_i}{V_t} \right) \dots\dots\dots 1.23$$

Where, n = the number of items,

Vi = the variance of the total scores and

Vt = the variance of the item scores

α = the mean of all possible split-half coefficients and the value expected when two random samples of items from a pool like those in the given test are correlated
Value level of reliability of the Cronbach's Alpha is given below (Hair et al., 2010):

Table 1.9 Cronbach's Alpha level of reliability

Level of Reliability	Cronbach's Alpha Score
Less Reliable	0.00 – 0.20
Rather Reliable	> 0.20 – 0.40
Quite Reliable	> 0.40 – 0.60
Reliable	> 0.60 – 0.80
Very Reliable	> 0.80 – 1.00

Form of evaluation made in the Likert's scale value of 1 to 5 denotes the individual opinion regarding their satisfaction level is categorised in the Table 1.7 & Table 1.8 (Likert, 1932 and Johns, 2010):

1.9.2.19 „f’-Test (Two-tailed)

The test statistic of a T test is T-value. Conceptually, T-values are an extension of the Z-score. In one way, the T-value represents how many standard units separate the media of the two groups (Navarro, 2015). The T test is a kind of speculative statistic. It is used to determine whether there are significant differences between the two groups (Woodward and Elliott, 2007). Independent two-sample t-test has been chosen for hypothesis testing to conduct this study.

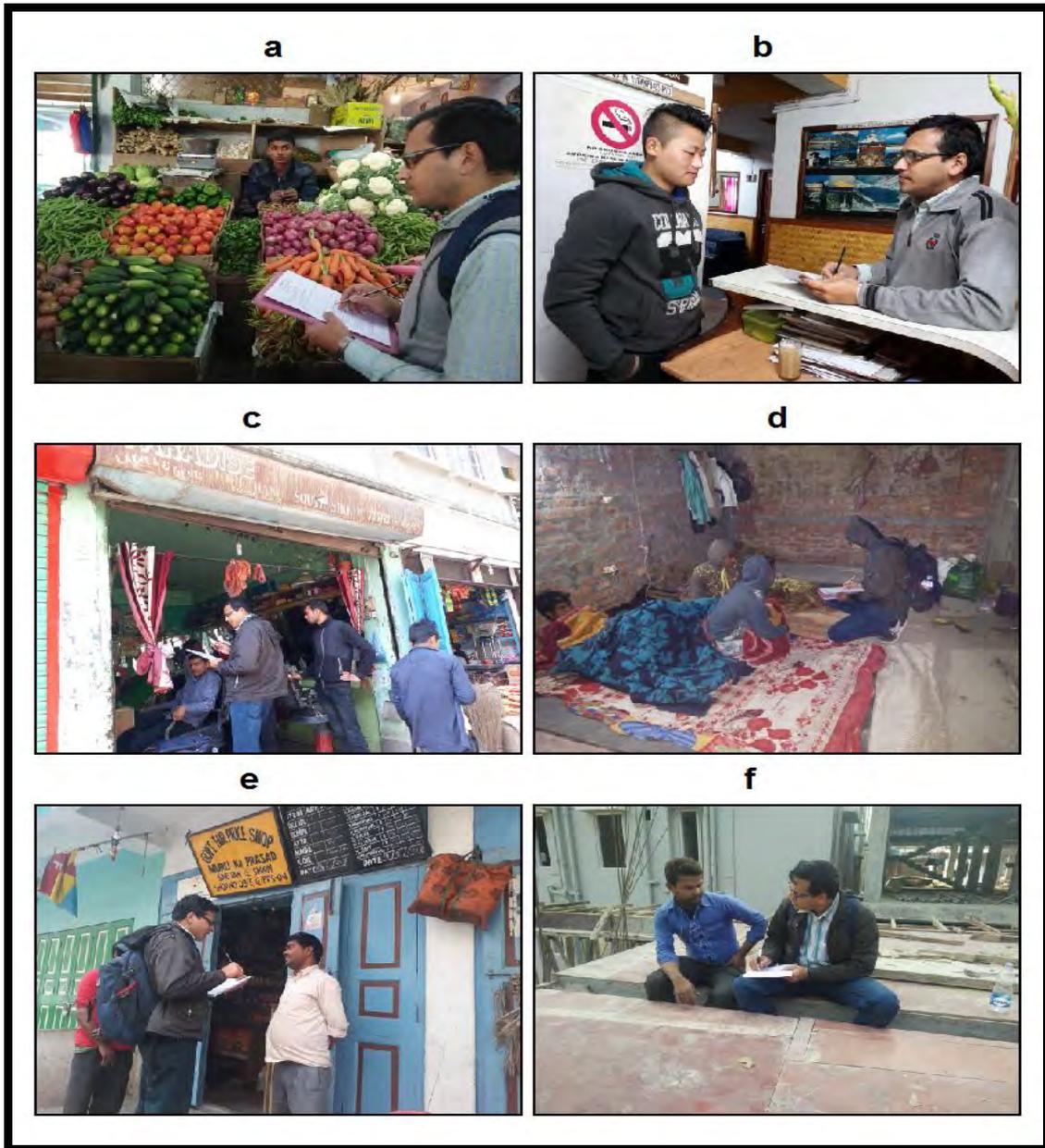


Plate 1.1: During Household Survey, 2018 (a) Lal bazar market, Gangtok (b) Twilight hotel in Gangtok (c) Saloon in Jorethang (d) Constructional work place in Sambuk (e) Ration shop in Singtham (f) Construction work place in Jorethang

Independent two-sample t -test is defined as (Abbott, 2016):

$$t = \frac{\bar{x} - \bar{y}}{S \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}} \dots\dots\dots 1.24$$

Where, $t = t$ - value

\bar{x} = Sample mean of x variable

\bar{y} = *Sample mean of y variable*

n = Sample size

S = Standard deviation of sample, and S defined as:

$$S = \sqrt{\frac{\sum(x_i - \bar{x})^2 + \sum(y_i - \bar{y})^2}{n_1 + n_2 - 2}} \dots\dots\dots 1.25$$

$H_0: \mu_1 = \mu_2$, and $H_1: \mu_1 \neq \mu_2$

in Two-tailed test at $(n_1 + n_2 - 2)$ Degree of freedom (df)

if, calculated t -value is greater than ($>$) critical t -value, then

H_0 is rejected and H_1 is accepted and vice – versa

H_0 = Null hypothesis and H_1 = Alternative hypothesis

1.9.2.20 Chi-square test

Relationships between classified variables are usually examined through chi-square tests. The null hypothesis of the chi-square test is that there is no relation between the individual variables classified in the data structure. The chi-square method compares the size of any difference between the expected and actual outcome based on the sample size and the variable number of relationships. The formula of Chi-square is as follows

$$\chi_c^2 = \sum \frac{(O_i - E_i)^2}{E_i} \dots\dots\dots 1.26$$

Where, c = Degree of freedom

O = Observed value (s)

E = Expected value (s)

χ^2 is the calculated chi-square value. Considering the critical values and the chi-square values for the different variables level it has been found that in most cases we found the relationship statistically not significant. Therefore, if the chi-square value is less than the critical value, it can be said that there is no statistically significant relationship between the variables.

1.9.2.21 ANCOVA

ANCOVA refers to “analysis of covariates”. Covariates are commonly used as control variables within groups. Adjusted means are usually tested to see if there is a significant relationship between the ANCOVA output and the F-test attendance. (Rutherford, 2001). Comparing the meanings of core and integrated groups can provide insights into the role of covariates (Mukherjee et al.,2018). Significant F-tests are used to examine the effect of each root and interaction in a single break dependent group consisting of individual divisions and for multiple (> 2) groups. (Krieg, 2012). F-group-variant consists of split segments. If the math p-value is small, significant relationships exist.

F- test is defined as (Gupta, 2000):

$$F = \frac{S_1^2}{S_2^2} \dots\dots\dots 1.27$$

Where, $S_1^2 = \frac{(X_1 - \bar{X}_1)^2}{n_1 - 1} \dots\dots\dots 1.28$ and $S_2^2 = \frac{\Sigma(X_2 - \bar{X}_2)^2}{n_2 - 1} \dots\dots\dots 1.29$

It should be noted that S_1^2 is always the larger estimated of variance, i.e. $S_1^2 > S_2^2$

$$F = \frac{\text{Larger estimated of variance}}{\text{Smaller estimated of variance}} \dots\dots\dots 1.30$$

$$\begin{aligned} n_1 - 1 &= v_1 \\ &= \text{Degree of freedom for sample having larger variance and } n_2 \\ - 1 &= v_2 \\ &= \text{Degree of freedom for sample having smaller variance} \end{aligned}$$

The calculated value of F is compared with the tabulated value of v_1 and v_2 at the significance level of 5% or instantaneous 1%. If the calculated value of F is greater than the tabulated value, then the F ratio is considered significant and the null estimate is discarded. On the other hand, if the calculated value of F ratio is less than the tabulated value, the null hypothesis is accepted and it is assumed that both the samples came from the same variable of the population. (Gupta, 2000).

1.9.3 Cartographic techniques

The various suitable cartographic techniques have been used to represent the analysed data for the study such as bar graph, compound bar graph, pie graph, star diagram, scattergram diagram, conical diagram, pyramidal diagram, boxplot diagram, pareto chart, sunburst diagram, funnel diagram, radar diagram, surface diagram and Treemap diagram etc.

For statistical analysis of data SPSS software version 26.0 has been used extensively. Maps were prepared with the GIS software ArcGIS version 10.3 to achieve the spatial database creation. Microsoft Office 2019 was used to calculate and prepare the different cartographic techniques and documentation pertaining to the study.

1.10 Summary

This chapter dealt with the outline of the present study. Structure of the study has been discussed in this chapter. This chapter concerns the conceptual framework of the study; statement of the problem, the rationality of the study; aim and objectives of the study; considered hypotheses of the study. The chapter extensively discusses the previous studies related to the topic. Appropriate methodologies have been chosen for the study. It also discusses the sources of secondary data. The chapter also highlights as to how to construct the sample design and determine sample size to conduct the household survey. The chapter further discusses different tools and techniques that have been applied in the study.

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