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CHAPTER I

Introduction

1.1 Prologue

Almost 200 years ago, the Reverend Thomas Robert Malthus put forward a theory of the relationship between population growth and economic development that still survives today. In his *Essay on the Principle of Population* Malthus postulated a universal tendency for the population of a country, unless checked by dwindling food supplies, to grow at a geometric rate, doubling every 30 to 40 years. The main reasons behind population growth have been fertility (birth), mortality (death) and migration.

Throughout most of the two million years of human existence on earth, humanity's numbers have been few. When people first started to cultivate food through agriculture some 12000 years ago, the estimated world population was no more than 5 million. At the beginning of the Christian era nearly 2000 years ago, world population had grown to nearly 250 million. From A.D. 1 to the beginning of the industrial revolution around 1750 it increased twofold to 728 million people. During the next 200 years (1750-1950), an additional 1.7 billion people were added to the earth's numbers. But in the next 35 years (1950 –1985) world population has almost doubled again, bringing the total figure at the beginning of 1985 to almost 4.9 billion. Turning from absolute numbers to percentage growth rates, for almost the whole of humankind's existence on earth until approximately 300 years ago, the human population grew at an annual rate not much greater than zero (i.e., 0.002% or 20 per million). Naturally this overall rate has not been steady; there were many ups and downs in the earth's numbers as a result of natural catastrophes and variations in growth rates among regions. By 1750, the population growth rate had accelerated by 150 times from 0.002 to 0.3 percent per year. By the 1950s, the rate had again accelerated, this time by threefold to about 1 percent per year. After that, less than three decades later, the world's population growth rate had almost doubled to a rate of 1.7 percent per year. Before 1650 it took nearly 35000 years, or about 1400 generations, for the world population to double. Whereas it took almost 1750 years to add 480 million people to the world's population between A.D. 1 and onset of the

industrial revolution, at current growth rates this same number of people is being added to the earth's population every 6 years.

The UN estimates that the world population reached 5.3 billion in 1990, and is increasing annually by more than 90 million persons. The rate of increase, 1.7 percent per year, has fallen below the peak rate of 2 percent per year attained by 1970. Growth was not steady but was marked by oscillations dictated by climate, food supply, disease, and war. Starting in the 17th century, great advances in scientific knowledge, agriculture, industry, medicine, and social organization made possible substantial increases in population. Inanimate energy gradually replaced human and animal labour. People slowly acquired the knowledge and means to control disease. All continents shared in a fivefold population increase over a 300-year period from about 500 million in 1650 to 2.5 billion in 1950 but increases were most striking in regions where new technologies were devised and applied.

Beginning about 1950, a new phase of population growth was ushered in when famine and disease could be controlled even in areas that had not yet attained a high degree of literacy or a technologically developed industrial society. This happened as a result of the modest cost of importing the vaccines, antibiotics, insecticides, and high-yielding varieties of seeds produced since the 1950s. With improvements in water supplies, sewage-disposal facilities, and transportation networks, agricultural yields increased, and deaths from infectious and parasitic diseases greatly declined. Life expectancy at birth in most developing countries increased from about 35-40 years in 1950 to 61 years by 1990. The rapid decline in deaths among people who maintained generally high fertility rates led to annual population growth that exceeded 3.1 percent in many developing nations, a rate that doubled population size in 23 years.

As of 1990, 1.2 billion people lived in the developed nations of the world, and 4.1 billion people lived in the less-developed countries. By region, over half the world's population is in East and South Asia. Europe and the countries of the former USSR contain 15 percent, North and South America make up 14 percent, and Africa has 12 percent of world population. Nine out of every ten persons who are now being added to the world's population are living in the less-developed countries.

As a country develops from primarily an agricultural to an industrial economy, large-scale migration of rural residents to towns and cities takes place. During this process, the growth rate of urban areas is typically double the pace of overall population increase. Some 29 percent of the world population was living in urban areas in 1950; this figure was 43 percent in 1990, and was about 50 percent in the year 2000. Urbanization eventually leads to a severe decline in the number of people living in the countryside, with negative population growth rates in rural areas. Rapid growth of overall population has deferred this event in most less developed countries, but it is projected to occur in the early decades of the 21st century. Most migrants to the cities can be assumed to have bettered themselves in comparison to their former standard of living, despite the serious problems of overcrowding, substandard housing and inadequate municipal services that characterize life for many arrivals to urban centres. Dealing with these conditions, especially in very large cities, presents massive difficulties for the governments of less-developed countries.

1.2 The Problem

As of 2001 census, India has a population of over 1027 million, which is about 16.7 percent of the World total of almost 4.8 billion. With only 2.4 percent of the total World area, population density in India is almost 324 persons per square kilometre varying significantly among states. Uttar Pradesh is the most populated state in India estimated more than Pakistan's population. West Bengal is the most densely populated state and Arunachal Pradesh is the least densely populated state in the country. In relation to economic resources India is at a far greater disadvantage. In terms of per capita income India is among the poorest.

During the 40 years of the present century India's population has grown almost steadily, resulting in an increase of 255 percent over the 1901 census total. In absolute terms India's population had increased over 162 million in the decade 1981-1991, an increase which is about 39 million more than the addition to the country's total population over the first half of the century. If 1921 is taken as the cut-off point signalling the onset of demographic transition in India India's population since then grew 172 percent in 1981 and by 337 percent in 1991. This rate seems particularly high when matched against population growth rates of developed nations experienced

during periods of comparable social and economic change. However, when compared with experiences of many of the developing countries, India's population growth rate does not seem to be too high.

While the rate of population growth in India seems to have started a declination, the experiences of the different regions do not conform to this pattern. There have been considerable variations in the experience of the different states. Although migratory movements could partly explain the variations among the states, the rate of natural growth is also likely to exhibit considerable variation.

The level and pace of urbanization have been quite low in India throughout the century. Even during 1951-61, the rate of urban growth had been only 3.1 percent per annum in spite of the fact that this decade marked a fairly rapid acceleration in the pace of industrialization. . The rate of urbanization increased to 3.3 percent during 1961-71 and to 3.8 percent in the following decade. The state exhibited a wide range of urban growth pattern during 1971-81, with such dissimilar decadal rates as 225 percent for the small states of Mizoram and 28 percent for Tamil Nadu as against a national rate of 46 percent. The rates of growth of urban population have been consistently higher than those of rural population as expected. This is due primarily to the net in-migration to urban from rural areas and to the growth of new towns. Rural population still constitutes about 76 percent of the country's total population, and thus any differential in natural growth rate would be weighted in favour of the rural population.

The annual population growth rate from 1990 to 2003 was 1.8 percent. Annual number of births in 2003 was about 2,50,52,000. Life expectancy at birth (years) in 2003 was 64. The total fertility rate in 2003 was 3.0. The average annual rate of reduction of total fertility rate from 1990 to 2003 was 2.4 percent. Total adult literacy rate in 2000 was 57 percent. The percentage of population urbanized in 2003 was 28. The average annual growth rate of urban population from 1990 to 2003 was 2.6 percent. The life expectancy of females as percentage of males in 2003 was 102. The adult literacy rate of females as percentage of males in 2000 was 66. 25 percent of the country's poor live in urban areas and 31 percent of the urban population is poor in

this country. In 1991, 39 million people migrated in rural urban patterns of which 54 percent were female.

According to the Census of India, 2001, the population in West Bengal is 80176197 and the male and female numbers are 41465985 and 38710212 respectively. The density of population per sq. km. is 904. Sex ratio of West Bengal is 934 females per 1000 males. The literacy rate of the state is 69.22 percent. The male and female literacy rates are 77.58 percent and 60.22 percent respectively.

The rate of growth of population in Darjeeling hill areas is higher than the rate of growth of population of India. In 1835 the original village of Darjeeling had scarcely 100 inhabitants. From this the population had grown in 1849 to 10000. The decennial growth rate (in percent) from 1981 to 1991 for Darjeeling has been 26.91 percent whereas there has been a decrease in the decennial growth rate from 1991 to 2001 the figure standing at 23.54 percent. The decennial growth rate of female has been slightly higher 18.93 percent and males 16.83 from 1991 to 2001. There has been an increase in density i.e. Population per sq. km also, 413 for the year 1991 and 510 for 2001. In 1951, sex ratio was 84:100; it has increased to 91 females per 100 males in 1991.

The rapid extension of agriculture in the early days of development resulted in the clearance of large areas of forest at favourable altitudes. The diminishing man-land ratio not only resulted in proportionate decrease in crop productivity, which is always lower in the hills than in the plains but also brought in various other environmental hazards. This rendered reservation of the remaining forests necessary for the conservation of timber and water supply and for protection against erosion. The effect was to eliminate the jhum method of cultivation, to ensure supplies of water, timber and firewood and to develop certain minor industries such as woodcutting, charcoal burning and timber sawing.

The interdependence of the hills and plain areas need to be properly recognized as lopsided careless development can create irreversible damage. Once a hill, a ridge or waterfront is destroyed, it can never be regained. The damage is permanent, and irreversible.

In the context of the hill region and towns, however, where semi-skilled and unskilled labour is generally abundant and can be gainfully employed in tourism industry, employment generation as a positive economic impact, becomes a decisive factor in impact evaluation as has been seen even in developed countries. The influx of rural migrants in response to the increasing demand for labour in various new and developing industries in many centres has led to a phenomenal growth of population in them. This rapid increase has aggravated the housing problem.

In addition to the above problem, with the increase in the population the human settlements are going to be more and more congested. Besides, the construction of house-type also has been changed.

Although tourism has to be viewed as a vehicle of economic growth in the hill regions, care has to be taken to curb the impacts of negative factors. Tourism results in adverse impacts leading to environmental stress. The first major source of environmental stress is the permanent restructuring of the environment brought about by a variety of major construction activities. Expansion of construction activities along the steeper slopes has exceeded the carrying capacity of the land. Hence, the frequent and intensity of landslides has increased. The second area of environmental stress results from the generation of increased waste residuals.

The present study will make an attempt to identify the major causes of population growth in Darjeeling district of West Bengal and its relations with the economy. It also attempts to capture the various dimensions of the livelihood patterns of the people in the Darjeeling district of West Bengal.

And in addition, few studies have attempted to capture the environmental problem due to over population in the hill areas of India, especially in Darjeeling district of West Bengal. The proposed work is an attempt to make an in-depth analytical study in this direction for the chosen area.

1.3 The Profile of the Study Area

The chosen study area is the Hill Areas of Darjeeling District (Darjeeling, Kurseong and Kalimpong sub-divisions), which is situated in the Jalpaiguri division of West Bengal.

For administrative and revenue purposes, the district has four sub divisions – Darjeeling, Kurseong, Kalimpong and Siliguri. The district head quarter is situated at Darjeeling town. For administrative purposes the hill region of the district is divided into nine thanas or police station areas. Darjeeling Sadar subdivision consists of the thanas of Darjeeling, Pulbazar, Sukhiapokhri, Jore-Bungalow and Rangli Rangliot, Kalimpong subdivision of Kalimpong and Gorubathan and Kurseong subdivision of Kurseong and Mirik.

Among the three hill sub-divisions Darjeeling has the highest density of population (380 sq. km.). The largest concentration of population seems to be in the town itself where the density is 6912 sq. km. Darjeeling has been containing 20.76 percent of the population, Kalimpong 14.64 percent and Kurseong 11.28 percent.

Darjeeling Sadar subdivision covers an area of 935.5 sq. km. (361.2 sq. miles). It occupies roughly 28.7 percent of the district area. It is the most populous of the three hill subdivisions of the district because of its good communication network, accessibility from the plains and availability of agricultural land. Darjeeling town as the most attractive tourist resort of the state has excellent job opportunities.

Territorially, Kalimpong is the largest subdivision, comprising 1056.5 sq. km. (407.9 sq. miles). This subdivision covers 32.4 percent of the district area.

Both in area and in population, Kurseong is the smallest subdivision with an area of 425.3 sq. km. (164.2 sq. miles). Thus the subdivision covers 13 percent of the district area.

The total population of Darjeeling district according to Census of India 2001 is 1605900. The male population is 826334 and female is 779566. Density of population per sq. km. is 510.

According to 1991 Census, 69.53 percent of the total population is rural and 30.47 percent is Urban. The percentage of male population is 52.6 percent and the percentage of female population is 47.7 percent.

Sex ratio of Darjeeling is 937 females per 1000 males.

Literacy rate of the district is 71.79 percent. The male and female literacy rates are 80.05 percent and 62.94 percent respectively. For the entire Hill Region i.e., the study area apart from the private schools, there are 705 Primary Schools, 45 Middle Schools, 30 Higher Secondary Schools and 12 Colleges, aided by the Government.

The economy in Darjeeling chiefly depends upon Tourism, the Tea industry and Timber. Residents who own hotels and restaurants provide employment for local people, while others earn a living by selling local handicrafts, souvenirs, and driving tourists around. Tourism is an important economic activity in the mountain area generating incomes and employment for the local population. The tourists every year spend to the tune of Rs. 70 crore.

Apart from tourism the biggest industrial activity and that offering the largest employment in the hills is tea. Today there are 87 registered tea gardens producing tea and the area on which this produced is 17500 hectares. Among them 11 are organic tea gardens and 2 are sick tea gardens. The total production ranges from 10 to 11 million kg annually. The industry provides employment directly and indirectly to about 50 percent of the population. 60 percent of the directly employed are women. The employment is on a family basis. In most of the gardens it is the third or fourth generation of workers who are employed. The Darjeeling tea industry employs over 55 thousand souls on a permanent basis round the year basis, while a further 25 thousand or so are engaged during the plucking season which lasts from March to November.

In the three hill subdivisions of Darjeeling district there are 8 government hospitals. Apart from that there are several health centres and private nursing homes.

1.4 Objective of the Study

The present study is planned with the following objectives.

1. To study the demographic pattern before and after the advent of the British in Darjeeling and also during post independent period.
2. To study the key factors which are responsible for the growth of population in the region.
3. To analyse the livelihood pattern of the population.
4. To analyse the occupational shifts of the people, that is, the causes and effects of the occupational shifts.
5. To study the vital statistics of the population and to assess the medical facilities available to them.
6. To assess the adverse impact on environment due to the massive population growth in Darjeeling.
7. To provide suggestions for the betterment of environment and economic development in the region for the future generations.

1.5 Significance and Expected Contribution

The Darjeeling district offers the most remarkable example of growth of population stemming significantly from immigration from outside. Urbanization through the establishment of a sanatorium at the nucleus town also led to growth of employment opportunities and hence to population increase. But the most potent factor contributing to the growth of population had been the tea industry. Growth of population in the district ultimately causes increase in the number of residential households. This has obviously resulted in the deterioration of open space in the district. Due to population growth along with massive destruction of forest in the successive decades the forest in Darjeeling are rapidly decaying. The ill effect of deforestation has adversely affected the environment, which in turn has resulted in soil erosion, floods and famines, changes in weather, jeopardizing agricultural productions etc. Population pressure affects the quality of air including water and soil adversely.

The main purpose of the proposed study would be to identify the root causes behind the population growth and its effects on the economy and environment as well

as on the human life. Identification of such things would help in finding out implications for future generations and also help in suggesting measures for policy-making authorities.

1.6 Research Hypotheses

In this research investigation we would like to test the following hypotheses.

Hypothesis I: There is a positive correlation between population growth and migration in hill region.

Hypothesis II: There is a negative correlation between population growth and impact on environment.

Hypothesis III: Increase in population growth causes rapid urbanization.

Hypothesis IV: Female labour force participation is higher not only in the tea industry but also in any field of unorganised sector of work.

Hypothesis V: Introduction of tourism in the hill regions causes more involvement of the labour force in the tourism industry and less interest of working in agriculture and allied activities.

Hypothesis VI: The mortality rate decreases, as the medical facilities are positively available to the people now a day.

Apart from the above set of hypotheses, we have every freedom of inclusion and exclusion of any hypothesis.

1.7 Sample, Data Sources and Methodology

The samples include three hill subdivisions of Darjeeling district, viz., Darjeeling, Kalimpong and Kurseong.

The study is based principally on secondary data to explain the pattern of demographic changes in Darjeeling hill areas. Some important data sources are District Census Handbooks of Darjeeling district, District Statistical Handbooks of Darjeeling district, Reports of the General Committee of the Indian Tea Association, Tea Statistics given by Tea Board of India, etc.

For effective comparison and valid conclusions the statistical unit of observation is the 'number' of persons in the economy, which depends on fertility, mortality and migration varying from year to year.

Along with the tabular presentation, numerous charts and diagrams will also be prepared. The tools used for analysing data would range from simple mathematical and statistical applications and tests to economic analysis depending on the analysis to be conducted.

After collecting data we will estimate the parameters of the mathematical functions. Mathematical analysis will set a model of mathematical equations from the tabulated data. Assuming that the fitted model will be a reasonably good approximation of reality we have to develop suitable criteria to find out whether the estimates obtained in are in accordance with the expectations of the theory that is being tested.

Statistical analysis will include determination of various statistical measures like correlation and regression, time series, index numbers, vital statistics, etc. Correlation will concern with the measurement of the strength of association between variables, while regression will concern with the prediction of the most likely value of one variable when the value of the other variable is known. In time series a series of observations will record in accordance with the time of occurrence. The index numbers will be an average computed from the data given in heterogeneous units. Vital statistics will be concerned with the measurement of some rates of mortality, fertility and overall growth of population.

If the chosen model confirms the hypotheses under consideration we may use it to predict the future values as well. And this estimated model might be used for different types control measures or policy purposes also.

1.8 Limitations of the Study

The present study is limited to only three hill sub-divisions of Darjeeling District- Darjeeling, Kurseong and Kalimpong and not another subdivision, Siliguri.

Again, this study will not consider the ethnicity of the people of Darjeeling and the distribution of the people on the basis of ethnicity, in details. Hence, the study will be able to represent only a partial picture of the pattern of demographic changes in Darjeeling.

Further the lack of data on the demographic pattern before the advent of the British in Darjeeling is another limitation for the present study.

However, modest attempt will be made to understand the subject from different angles and to minimize such limitations.

1.9 Review of Literature

Studies conducted and literature available related to the chosen area of research work enables the researcher to identify the issues that may be considered relevant or closely akin to the subject or region under study. The following section is an endeavour to focus on the already published works relating to this study.

Migration And Population Growth

According to Datta (2003) apart from birth and death rates the migration is also very important in the district of Darjeeling. Saha (2000) says that most of the rural people like to migrate to urban areas for jobs and other purposes.

Mittal and Sharma (2002) argue that in India, the urban population increased from about 10 percent in 1911 to 24 percent in 1981. Net rural-urban migration accounted for about one-fifth of total urban growth during 1961-71 and 1971-81. Most of the women's migration is short distance migration and also seasonal in character in India. Kapila (2000) pointed out that there is some indication that net rural-urban migration has increased in absolute magnitude, but its contribution to

urban growth during 1961-71, 1971-81 and 1981-91 was only 21, 20 and 29 percent, respectively.

In Darjeeling Campbell gave much encouragement to immigrant cultivators and populations rose from about 100 in 1839 to about 10000 in 1849 (Das, 1978). Fareedi and Pasang found that the percentage of rural population in Darjeeling has gradually declined across the years. This would be mainly because of migration from rural to urban areas for employment. Sarkar has analysed that the result of unexampled immigration of the people of Nepal can be realized by the census data of 1891 in which it was found that no less than 88000 persons was born in Nepal. The rapid increase of population in the hills has made Darjeeling a real city from quantitative point of view. Many Tibetans and Chinese people have arrived in Darjeeling for trade purposes. Many more plainsmen have started settling in the urban areas. Das (1978) states the steady improvement in communications due to the building of Railway and roads also facilitated the immigration of population. Chattopadhyaya (1987) says that immigrants from Nepal annually augmented the population of Kalimpong and the adjoining localities east of the Teesta River. Migration from Nepal to take up land for cultivation in Kalimpong continued in 1879-80, and in 1875-76.

Sharma (1994) noticed that by 1850, the entire hill areas of Darjeeling located west of the river Teesta had witnessed a favourable zone for cultivating the Cinchona plants. The areas were developing at a very fast pace especially due to the colonial policy of British Government and her encouragements for the Nepali migration from Nepal and Sikkim as the plantation workers in Mungpoo. The introduction of Cinchona plantation at Mungpoo mainly attracted a few people of eastern Nepal and Sikkim and they migrated to the plantation in search of jobs. Rest of the working population was enticed from the local people. In Rongo Medicinal Plantation, the workers were mostly consisting of the immigrants from Burma.

Peterson (1975) argued that individual migrants become permanent residents of the new country does not mean that one can merely add them up to derive the demographic effect of the migration. If 1000 persons migrate from Country A to Country B, the population of Country A is decreased by 1000 and that of Country B is

increased by the same number. According to him in all probability the shift will bring about changes in the population structure, economy and social conditions of both the countries, and these changes in turn will influence the population growth of each of the countries. He has shown that the relation between migration and population growth can be analysed with three components: firstly, the direct movement of the migrants themselves, secondly, the effect of the movement on the population structure of the two areas, which ordinarily increases the size of the transfer, and thirdly, the effect on social-economic conditions in the two areas, which may reduce or cancel the results of the transfer.

Rao (1986) has accepted that historically both internal and overseas migration have been associated with widespread military conquests, agricultural colonization and plantations, expeditions of merchant traders, and religious missionaries, slave trade and indentured labour. He has argued that studies in migration stemmed from two theoretical sources: culture contact theories and the Marxian analysis of colonization and alienation. While the former approach is dated, the latter is still significant in studying the process of migration and its consequences in the context of the capitalist mode of production development and underdevelopment.

Tea Industry And Population Growth

A number of books have been published on tea plantation in Darjeeling. Ghosh (1987) revealed that in 1874 there were 129 Europeans employed as managers or assistant managers of tea gardens in Darjeeling and under them there were 1373 natives in posts of trust or authority. The total number of such workers employed in all the gardens was 19424, while the returns of 1873 showed only 14019. Evidently a decrease in the number of Europeans working in the tea gardens, it can be presumed at the same time that the number of the Indians or Nepalese increased. The main causes of the rapid increase of the population have been development of the tea industry and the influx of settlers to cultivate the wastelands of the district. The tea plantation workers are mainly the immigrants or the descendents of migrants from various parts of the country and even from the neighbouring countries. The indigenous people of Assam, Bengal and South India did not accept the works in the plantations due to low wage and isolation from the mainstream of national life. The

history of their migration is normally dates back to early eighteenth century. The tea garden workers in Assam and Dooars are mainly the tribes from Bihar, Orissa and Madhya Pradesh while the entire work force of Darjeeling hills are exclusively of Nepalese origin (Sharma, 1999).

Sarkar recognized that by the middle of the nineteenth century tea industry had become the major economic activity in Darjeeling. The tea industry had a predominating influence upon the growth and development of the hill city. The Darjeeling Himalayan Railway that was opened up in 1881 was practically aimed at carrying the tea to the plains. The rapid growth of tea industry in Darjeeling hills has obviously resulted in the huge demand of labour force and the local inhabitants were found to be insufficient to solve this rising demand of labour.

According to Chattopadhyaya (1987) a noticeable feature of the migration of labourers of the Burdwan Division in the nineteenth century was that the labourers while wandering about in a district looking for some employment were picked up and registered by contractors who used to despatch the major portion of such registered labourers to the tea districts of Assam, Cachar, Darjeeling and Jalpaiguri, a smaller number being sent to Chittagong as well. There was a 'constant' influx of labourers from Nepal for employment in the tea gardens of Darjeeling.

Tourism and Employment

Kaul (1985) showed that when tourists pay for goods and services in other countries, these amounts are reflected as national travel receipts for such countries. The contribution made to the economy of a country by tourism would depend upon these receipts, and would establish the importance that tourism has for that country. Receipts from international and regional tourism are in foreign currency and accrue to a country as "foreign exchange". He also stated that tourism is a manpower intensive activity and increasingly provides direct and indirect employment both in the skilled and the unskilled categories.

Singh (1996) observed that throughout the world tourism has emerged as a major sociological and economical factor. The turnover figures are indeed tremendous. It will not be an exaggeration to say that tourism has now become the

largest industry in the world. According to him tourism is not only an economic activity of importance to national development, but also an important medium of cultural exchanges among nations of the world. Kamra (2001) said that there is hardly any other economic activity, which is capable of generating as much added value, employment and hard currency (foreign exchange) and that also at such a low cost as tourism.

Female Workforce Participation

In both South-east Asia and in Latin American cities, plenty of opportunities are available to women in the service and industrial sectors (Engracia and Merrin (1984), Fernandez-Kelly (1983); Meyer (1982), Khoo (1984)). It has been established that women are no longer passive movers who follow the household head (Fawett et.al (1984), Rao (1982)). Malik and Giri (1986) opined that female labourers are paid in commensuration with their work efficiency. In India, various studies have been conducted on female workforce participation from diverse angles. Women in rural India as well as in rural West Bengal are involved in many activities both in farm sector and off farm sector. Arun (1999) found on the basis of fieldwork in two panchayats of Kerala in 1996 that woman's responsibilities over farming as well as their general work burden was heightened in households where men migrate to Gulf. Almost 48 percent of women in Arun's sample, were managing the family farm as their husbands had paid employment and were migrants or were absent for other reasons. About 35 percent of women were involved in paid work and 7 percent were employed in the formal sector but also undertook some farm supervision. Visaria (1976) observed that the never-married female work participation rate was more than currently married females but less frequent than widows and divorced females in urban Maharashtra. On the other hand, in rural Maharashtra, the never-married females have lower labour force participation rates than both currently married females as well as widowed and divorced females. Based on 1961 census, Mitra et. al. (1979) found that 12.1 million females were engaged in household and non-household industries other than cultivation.

Some studies examined the contribution of female labour force participation in terms of income. For example, Tuteja (2000) and Rana (2004) analysed that females



workers in Haryana contributed significant portion of their income. Mencher (1986) and Saradamoni (1982) in their study relating to six villages (two each in Kerala, Tamil Nadu and West Bengal) found that in households with no land, where both women and men were earners, the average of women's contribution to household earnings was more than the men's in five villages and equal to the men's in the sixth. Among marginal landowning households too, female earnings from outside work ranged from a little under half to well over half of the total household earnings from outside employment.

Regarding studies on the pattern of time allocation by women and men, Jain and Chand (1982) observed that rural women work larger hours than men in Rajasthan and West Bengal. Another study of Batliwala (1985) based in Karnataka examined that women put in the same number of hours but expend more total energy in the tasks they do. Some studies that have examined women's work alone find that a 14-16 hour working day is common in certain area even among pregnant women (Khan, 1983 for Uttar Pradesh).

Unni (1999) and Visaria (1999) observed that the recent trends in women's employment participation both in the NSS and census data shows a marginal increase, compared to previous decades, while the important feature of this trend is the increasing casualisation and informalisation of women's work. Unni's Study (2001) on labour market in South Asia further examined that there was less gender difference in the proportion of regular workers as compared to casual workers. The proportion of regular women workers doubled during 1977-78 to 1993-94, while there was not much of an increase in male regular workers. Standing (1998) argued that the growing flexibility in the labour market or increasing informalisation, had led to feminisation of the labour force. Sundaram (2001) also observed that in the 1990s (between 1993-94 and 1999-2000) the number of days worked by usual status women workers increased from 241 to 246 days in the year in all activities – agricultural and non agricultural.

As regards the wages, there are evidences to show that the increase in real wages of the 1980s was not sustained in the 1990s either in agriculture or non-agricultural sectors for both men and women (Unni, 1999). While analysing the nature

and trends of employment under the changing policy regime, studies have also suggested a higher labour absorption by the unorganised segment of the economy (Papola, 1994 and Despande and Despande, 1998).

Population Growth And Environment

Saha and Chakravarty (2000) highlight that at least 30 percent of the terrestrial area on this planet should remain covered with forest to maintain a healthy environment. According to an estimate in 1987 forest has been reduced to less than 10 percent of the area, which it occupied 50 years ago in Madagascar, Western Ecuador and Brazil. In India there is only 12 percent of land covered with forest.

Datta says that wanton destruction of forest along with intensive grazing, irregular and faulty agricultural practices, construction of roads along with explosion of dynamite in hill areas without adopting adequate protective measures and also other biotic factors are the main contributing factors in aggravating the problem of soil erosion and landslides in the area. Besides these the high rainfall in the mountainous region and the foothills may also be the contributing factors in this regard. With the rapid growth of population the people are depending more and more on land and consequently land is fragmented and the forests have been encroached upon. It has been estimated that a large number of villages in the rural hill areas are prone to constant landslides particularly during rainy seasons.

Saha and Chakravarty (2000) established that air pollution has been aggravated by four particular developments. That typically occurs as countries become industrialized; growing cities, increasing vehicular traffic, rapid economic growth and industrialization and higher levels of energy consumption. Incomplete combustion of fuel in motor vehicle produced carbon monoxide, which is a poison for respiration.

Saha (2000) showed that piping, soil creep, slumping and pinnacle are most important means of soil erosion in the hilly terrain of Darjeeling Himalaya. The results of high population growth are soil erosion, landslides, desertification and deforestation. Deforestation due to over exploitation of forests results in global warming and loss of bio-diversity. Losses of life, property, displacement of people are

some of the effects of soil erosion and landslides. Fareedi and Pasang investigate that Darjeeling has witnessed a sudden growth in the number of taxis and vehicles, which is now posing a major threat to the health and environment of the people in terms of vehicular pollution.

Jhingan, Bhatt and Desai (2003) argues that rising population is a major source of environmental degradation in India. Population affects the environment through the use of natural resources and production of wastes. These lead to loss of bio-diversity, air and water pollution and increased pressure on land. Excessive deforestation and overgrazing by the growing population has led to land degradation. A major cause of the loss of bio-diversity has been the depletion of vegetation in order to expand agriculture by the rapidly rising population.

Urbanization

The 43 percent of the World's people is currently living in urban areas occupying only 5 percent of the earth. Major cities face a number of resource and environmental problems. Most of the cities have relatively few trees shrubs or natural vegetations that absorb air pollutants, give off oxygen, and help cooling the air. The process of urbanization, a man induced phenomenon results in the transformation of mostly natural landscape of the richly vegetated countrysides into the development of cities. Towns are characterized by concrete structure, which greatly modify the pre-existing climatic conditions of the countryside of pre-urbanized stage. Unplanned urbanization and environmental degradation are most vital problems for high pressure of population growth and rapid urbanization. The various factors of well-developed city of large size viz. density of buildings, height of the buildings, size of the city, size of population, length and breadth of roads etc. modify the climatic condition of the city. It had been estimated that in 2001, the percentage of urban population to the total in the whole world, developed and developing countries would be 51.3, 78.8 and 43.5 respectively (Saha and Chakravarty, 2000). In China, for example, the proportion of urban population was reported to have increased from nearly 22 percent at a time of the 1982 Census to about 53 percent by mid 1989; but the 1990 Census has reportedly classified only 26 percent of the population as urban. In Sri Lanka and Thailand, in mid 1989, only 21 to 22 percent of the population was residents of urban areas.

According to Kapila (2000) the total urban population in India in 1991 (including Jammu and Kashmir where the census was not conducted) was about 218 million. In India the percentage of urban population to the total in 1951 was 17.3, while in 1991 it was increased to 25.7 percent (Saha and Chakravarty, 2000).

Jhingan, Bhatt and Desai (2003) observe that with rapidly growing population, it becomes difficult to manage the adjustments that accompany economic and social change. Urbanization in Under Developed Countries creates such problems as housing, power, water, transport, etc. Besides growing population threatens permanent environmental damage through urbanization in some rural areas.

Educational Facilities

Bagchi (1998) analyses the situation and argues that British came to India with radically different cultural tradition the commercial aims, which was at the same time scientific and effective. To attain the end English education was required and it was introduced by the East India Company. She says, "From 1813 the Company set aside some money for education and after the charter act of 1833 English became the official language. In 1844 Lord Hardinge announced that English Educated Indians would be given preference for Governments appointments. Free traders voiced their support for this policy believing it would help to develop an Indian population loyal to the British. The Missionaries joined the chorus of Approval. Eager to convert Indians from influential families, Missionaries recognized how much easier it would be with English as the language of professional advancement." Again she investigates that gradually, Missionary activities have started in Darjeeling from 1895. Their main aim was to convert people to Christianity, and also to impart education to European and Anglo-Indian communities as the place was found suitable for them because of scenic beauty and cool climate of this place. From 1940 up to 25 percent of Indian students were admitted to these European schools. However, they came from very cultured and wealthy families and they came to get the frail of western education not to embrace religion.

O'Malley (1907) observed that the missionaries were the pioneers of education among the native population. First Mr. Start opened up a school for the Lepchas. In 1873 a school for the Bhutias was also established. By the end of

nineteenth century several English schools, numbering at least 10, were opened up for educating the children of Europeans and Anglo Indians (Sarkar). In 1873 there were 25 Primary schools with 615 boys and girls receiving instructions. But in 1907 there were 70 schools of which 55 were both day and night schools with a roll of 2420 boys and 300 girls and an average attendance of 1880. In 1860-61 there was only one school receiving government aid, which had a total attendance of 16 pupils. In 1904-05 there were altogether 142 schools with 3950 pupils. The total expenditure on education in the same year amounted to Rs. 38216 only (O'Malley, 1907). According to the fifth All India Educational Survey of 1985, about 95 percent of the rural population had access to a primary school within 1 km and 85 percent had a middle school within 3 km (Kapila, 2000).

Female Education

O'Malley (1907) found that in Darjeeling the proportion of literate females rose during the decade ending in 1901 from 5 to 14 per 1000 (approximately 1 in 71) – a ratio surpassed by no other district in Bengal outside Calcutta. The schools for girls are the Diocesan Girls' School (Church of England), the Loreto Convent (Roman Catholic), the Queen's Hill School (American Methodist), all situated at Darjeeling and the Dow Hill Girls' School, maintained by Government, situated at Kurseong. Both the Maharaja of Cooch Behar and Burdwan took special interest in the field of education. Maharani of Cooch Behar and Maharajadhiraj of Burdwan Bijay Chand Mahatap were the chief supporters of Maharani Girls' School (Sarkar).

The 1991 Census has shown a rapid increase in the literacy rate among women compared to that among men. In spite of this, rural female literacy rate (25 percent) is only half the male rate of 47 percent (Kapila, 2000).

1.10 Brief Overview of the Chapters

Chapter II deals with the origin of the name of the district as well as the topography and physical settings of the hill areas of Darjeeling district. It also provides a brief history of Darjeeling. Growth of population, composition of population and distribution of population has been presented in Chapter III. This chapter makes an exhaustive study on the demographic pattern before and after the

advent of the British in Darjeeling and also after Independence. In this chapter a directional analysis has been done with the help of suitable econometric tools and techniques as per necessity. Chapter IV is about the key factors, which are responsible for the growth of population in the hill areas of the district. This chapter specifically deals with the consequences of the key factors in the economy of Darjeeling. In this context we have used necessary economic analysis to ascertain hypothesis mentioned. Chapter V examines different economic trends and miscellaneous occupations of the people in the Darjeeling district of west Bengal. It makes a comprehensive discussion of their different livelihood pattern. Level of prices has also been clearly depicted in this chapter. In a section the pattern of occupational shifts and its effect on the economy have been discussed. In Chapter VI we have described the different medical facilities, which are available to the people. In this chapter we have also analysed in detail the vital statistics of the population in the region. Chapter VII is related to the impact on environment due to the population growth. The huge rate of population growth is adversely affecting the environment in this region. The felling of trees for the expansion of urbanization as well as the construction of multi-storied buildings and the rising of the number of cars plying on the hills everyday, all lead very dangerously to a critical environmental decay in this region. As we know that Darjeeling is an earthquake prone area in the world so the large amount of deforestation and construction of high-rise buildings without any anti earthquake measure will obviously lead to an unsafe path for the future generations. Chapter VIII summarizes and concludes. It also provides suggestions for policy measures for the betterment of environment for the future generations.