

**Tea Plantations in the Darjeeling District, India:
Geo-ecological and Socio-economic impacts
in Post-Independence Period**

By

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**“Tea Plantations in the Darjeeling District, India:
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Lalit Premlal Tirkey

**A Thesis/Practicum submitted to the Faculty of Graduate Studies of The University of
Manitoba in partial fulfillment of the requirement of the degree
Of
MASTER OF NATURAL RESOURCES MANAGEMENT**

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Abstract

The purpose of the study was to describe and explain the impacts of tea plantations on the geo-ecological and socio-economic conditions of the communities in the Darjeeling District in India. Two contrasting tea estates, Mineral Spring and Singell, were selected for case studies with an aim of obtaining the four objectives, including a brief history of the tea plantations in the Darjeeling District, its geo-ecological and socio-economic impacts on the place and the people and strategies to deal with these problems. Qualitative methods, including semi-structured interviews, non-participant observation, transect walks, story narration, informal discussion and document reviews were employed for data collection.

After early expansion and growth of tea plantations, Darjeeling tea plantations experienced major set backs in the Post-Independence period; ownership changes, entry of trade union, labour problem and decline in tea yield due to over-aged tea bushes, eventually resulted in acute financial crises and closure of many tea estates. Mineral Spring and Singell Tea Estates are illustrative of Post-Independence plantation crises that faced either temporary or complete closure. However, both areas reinvented themselves in late 1990s with the creation of an effective community strategy in Mineral Spring and an institutional strategy in Singell T.E. As regards geo-ecological conditions, even as the Darjeeling region continues to be ravaged by yearly landslides, the two cases present positive environmental measures. Tree plantations by households in Mineral Spring and combined efforts by management and 'Peoples' Action Group' in Singell have achieved considerable success in reducing the problems of deforestation and landslides/soil erosion. However, the on-going negative socio-economic impact of the declining tea industry, increasing populations and other factors have meant that tea plantations, including Singell T.E have been unable to provide sustainable livelihood to the plantation community. This is in contrast to Mineral Spring where the transformation of a tea plantation into revenue-village has improved the socio-economic conditions of the community. Both Mineral Spring and Singell T.E have demonstrated ways to positively impact the environment of the Darjeeling District. At the same time, they suggest that in order to usher in socio-economic prosperity, development of community-based management groups on plantations, combined with some measure of worker ownership of their lands or other resources is the hope for the future.

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Chapter 1: Introduction

1.1 Background

Mountain ecosystems are generally considered sensitive and, often due to lack of proper management of natural resources, these regions become easy targets of environmental degradation (Messerli & Ives, 1997). In the last three and half decades, the Himalaya, one of the youngest and most tectonically active mountain ranges, has become the focus of intense interest and research. In the past decades unchecked deforestation, faulty land-use practices, settlement of burgeoning population on mountain slopes, unregulated construction of roads and encroachment of forest lands for the creation of arable lands have caused adverse geo-ecological impact in the Himalayan Range (Ives & Messerli, 1989).

These phenomena may be witnessed in the Darjeeling District, which is situated in the Eastern Himalaya. A special feature of this area is the cultivation of tea (*Camellia Sinensis*) on varying slopes covering about 18,000 hectares of land (O'Malley, 1907; Chaudhuri, 1978; Starkel & Basu, 2000). The establishment of the first commercial tea plantation, Tukvar Tea Estate, by the British-owned East India Company in 1856 was believed to have heralded the beginning of a new era in the Darjeeling Hills by bringing about much needed economic growth (O'Malley, 1907; Eden, 1965). It is an indisputable fact that the economic development of the region coincided with the development of the tea plantations. The tea plantations opened up employment opportunities for local hill people but also for thousands of people from rural Nepal, who immigrated to these plantations as indentured labourers from 1850 until 1930s (Bhada, 1992). According to the Plantation Labour Act (1951), promulgated by the Government of India, "a 'Plantation worker' is defined as the person who has been employed by the management to

do any work, which is skilled, unskilled, manual or electrical; the person must not have drawn above Rs. 750/month". Indeed, there are thousands of individuals who work on various tea plantations in Darjeeling District as plantation workers for their livelihood. Undoubtedly, even to this day, the tea industry is providing employment to thousands of people as unskilled/skilled workers, clerks and managers, besides providing ancillary employment opportunities in chest-tea, plywood, tea packaging and other businesses or trades linked with the tea industry (Choudhari, 1978; Sarkar & Lama, 1986).

These economic developments notwithstanding, the tea plantations have had an adverse impact on geo-ecological and socio-economic conditions of people in the Darjeeling Hills. The increase of tea plantations—just one tea estate in 1856, 39 in 1866, 113 in 1874 and 186 by 1905—seems to have led to large-scale deforestation, landslides, soil erosion, loss of wildlife and biodiversity (O'Malley, 1907; Starkel & Basu, 2000). At the present time, the number of tea estates has shrunk to about 87 but the acreage of plantation land has remained constant, exerting additional pressure on the local ecology and economy. Moreover, the use of pesticides, herbicides and fertilizers has caused contamination of river/streams and degradation of land (Raina, 1992; Chettri, 2004).

On the socio-economic front, the pivotal role of tea plantations in sustaining the communities has been declining dramatically in recent years owing to a variety of reasons; one of them being growing population in and around the plantations. This growth in population has resulted in increased unemployment in tea plantations while the gradual decline of the Darjeeling tea industry has affected the sustainable livelihoods of all plantation workers. To add to their woes,

the tea plantations in the Darjeeling District find themselves at the crossroad in the brewing tea-market crises resulting from stiff competition from other tea producing countries, steady decline in tea-price and increasing costs of production in India (Moitra, 1991). This situation has led people to search for other means of livelihood support including the tapping and depletion of other natural resources such as forest, vegetation and land. Due to lack of money to buy fuel, people are targeting adjacent forests for fuel wood and slope land is being used for cultivation; thereby, accentuating damages to the local ecology (Basu, 1990; Bhadra, 1992). This, in turn, has exerted additional pressure on the land and water, resulting in further environmental degradation (Rustomji & Ramble, 1990) and deterioration of socio-economic conditions of the hill people (Karotemprel & Roy, 1999).

With the decline of the tea plantations, livelihood sustainability is challenged; especially as no other large industries, except for tourism in recent years, are established in the region. The potential loss of livelihood is having a direct impact on the tea plantation workers. In the event of job uncertainty, there is a new phenomenon of out-migration from the plantations to towns and urban areas in the region. This phenomenon is causing new problems, as people from erstwhile economically stable plantations are moving to urban centers for jobs. This adds to the land pressure by building houses on the slopes but also causes ecological hazards by increasing space-shortage, water scarcity and drainage problems (Sarkar & Lama, 1986). The increased human settlement is adding to the vulnerability of Darjeeling and other urban areas (Sarkar & Lama, 1986), as they are located in a seismic prone region (Starkel & Basu, 2000). After the first recorded major landslide in 1890, there were hardly any significant landslides, for more than half a century, as noted by Roy (1965) and Choudhary (1978). In recent decades however, the

incidence of small landslides has multiplied; all along the Hill Cart road numerous small and big landslides can be observed (Bhattacharya, 1971; Basu, 1979). While many consider heavy rain as the major factor for these landslips, they have been aggravated by human interference through faulty land-use practices and other developmental activities (Bhattacharya, 1971; Basu, 1979). The expansion of tea plantations was generally believed to have led to a large-scale deforestation (O'Malley, 1907; Palit, 1966). There are not enough data to suggest that clearing of forests for plantations (tea/cinchona) in turn have caused large-scale landslides. In fact, tea bushes seem to have played a significant role in stabilizing some local landslides and soil-erosion. However, Starkel and his colleagues have claimed that during the 1968 landslides that followed three days of incessant rain, more land was lost in the tea plantation areas as compared to land in the forested areas (Starkel, 1993).

This backdrop suggests that there is a need to understand the geo-ecological and socio-economic conditions of the communities due to impact of changing roles of about a hundred and fifty years old tea plantations in the Darjeeling Hills. There is also a need to analyze the changes occurring in the tea plantation as a result of growing unemployment, increasing population and a decline in the Darjeeling tea industry.

Research Question: Land use history has had a significant impact on geo-ecological and socio-economic conditions in the Himalaya. The central research question in this context and with reference to the Darjeeling District is: what is the impact of 150 years of tea plantation land uses in the area and the communities?

1.2 Purpose and Objectives of the Research

The purpose of this thesis is to describe and explain the influence of tea plantations on the geo-ecological and community-level socio-economic conditions in the Darjeeling District.

This is done using two case studies.

Objectives:

The objectives for the research process are:

1. To briefly describe the evolution of tea plantations in the Darjeeling area since India's Independence (1947).
2. To describe and explain the geo-ecological impacts (landslide and soil-erosion) arising from the development of tea plantations.
3. To describe, evaluate and explain the impact of tea plantations on the social and economic situation of local communities.
4. To identify and propose institutional strategies that will assist the situation of the local communities and the sustainable use of land in the future.

Objective 1: Evolution of Tea Plantations in the Darjeeling Hills:

The first objective is to prepare a brief history of the start and subsequent expansion of tea plantations in the Darjeeling area. In order to focus on the scope of the objective, the year of India's Independence (1947) was chosen as a base line year. Because the approach being used is that of comparative case study, particular focus was placed on the history of two selected plantations. Their evolution, growth and decline were seen in the context of changes in the entire Darjeeling area, apart from changes in ownership, entry of trade unions, rule of Marxist

government in West Bengal and closure of many plantations. The growth, decline and other aspects in the selected cases are compared and contrasted.

Objective 2: Geo-ecological (landslides/soil-erosion) Impacts of Tea Plantation:

The second objective is to determine the instances of geo-ecological impact, (such as soil erosion and landslides) which followed the expansion of tea plantations and are prevalent to the present. Interviews conducted in the selected areas, as well as documents, records, publications and files referred to from various sources, helped in describing, explaining, comparing and contrasting the phenomena of deforestation and its effect—landslides and soil-erosion.

Objective 3: Impacts of tea plantations on socio-economic conditions of the community:

The third objective is to assess and evaluate the impact tea plantations have had on local communities. The beginning of the tea industry has always been considered a watershed event that brought development and revenue to the region. Ever since, tea continued to act as the backbone of local economy. By providing employment to numerous households, tea plantations have played a pivotal role in the lives of people in the Darjeeling District. In retrospect, however, the evolution of this industry prevented the establishment of any viable alternative livelihoods and made the people over-dependent upon tea for their social and economic well-being. Consequently, the recent crisis in the tea industry of West Bengal has led to serious impacts on the livelihood sustainability of the local communities. In some cases, people have turned to scarce slope land for cultivation or sold forest wood to support their families.

Objective 4: Proposed Institutional Strategies as Peoples' Response:

The fourth objective is to consider the local hill communities' courses of action in the wake of one of the worst tea crises in North Bengal. It has not just affected the tea economy but has also forced the workers to look elsewhere for their livelihood. Measures taken by the government,

non-government agencies or people themselves were explored and recommendations made. Also evaluated are steps being taken to include people's participation in the management of plantation and local resources, in order to improve the environment and peoples' quality of living.

1.3 Study Setting and Site

The geographic area of the study is the Darjeeling District, situated in the eastern Himalaya of India (Fig 1). This is a mountainous area in the northern part of the state of West Bengal that lies between $87^{\circ} 57'E$ and $87^{\circ} 59'E$ longitude and $26^{\circ} 48'$ and $27^{\circ} 13' 30''$ latitude (Das, 1990). This area is surrounded by the state of Sikkim on the north and three small countries (Nepal, Bhutan and Bangladesh) in the west, northeast and southeast respectively. The hill area of the district, namely, the Darjeeling Hills, covers approximately 2195 km^2 of the total 3075 km^2 area of the entire district. The elevation of these hills varies from 800 m to over 2600 m above sea level, with numerous high ridges and low-lying valleys (Gerrard, 1994; Starkel & Basu, 2000).

The Darjeeling Hills, with an average elevation ranging from 880 m to 2600 m form a unique part of the eastern Himalaya. The altitude of Kurseong sub-division varies from 1000 -2000 m. They form part of the Darjeeling District that is located in the northern most part of the state of West Bengal. This part of the district drains many fast flowing rivers; such as the Teesta, Great Rangit, Mahanadi, Balasan and numerous *kholas* (streams) and small water channels (*jhoras*). A salient feature of the river system in the Darjeeling Hill area is that, though, there is "an extensive network of rills, rivulets and rivers, such streams only unload themselves into the other major rivers flowing through the hill areas. Major rivers inside the Darjeeling Hill area receive

tributaries from the other rivers/streams and act as their distributaries.... This explains the high frequency of floods and non-navigability of the rivers in the hill areas” (Symroy, 1985).

The annual average rainfall in this area is about 3000 mm. The soil varies from sandy loam to red and yellow podzol on the higher slopes to rich humus in the lower valleys. The combination of these features and the climate make this place suitable for the growth of a variety of forests at different elevation. The terrain represents a labyrinth of ridges and deep valleys comprising Siwalik, Gondwana, Daling and Darjeeling Gneissess and Schistose rock formations (Basu, 1979). The presence of sandstones and siltstones of the Darjeeling Gneissess, subject as they are to severe weathering and erosion, helps to explain the susceptibility of this area to landsliding and other natural hazard processes (Basu, 1979; Bhattacharya, 1971). Though a great deal of land was taken up for plantations (tea and cinchona), forests are still present in places away from human settlements (Das, 1990). Of course, tea bushes decorate a vast landscape on the slopes, the cultivation of which takes place on elevations ranging between 625m and 1250m (Das, 1990).

Study Sites:

My field study focused on two selected sites (Fig. 2), one each in the sub-divisions of Darjeeling and Kurseong, located about 55 km from one another in the state of West Bengal (Fig. 1).

Mineral Spring (*Dabaipani* in Nepali) Plantation lies on the Lebong Spur of the Darjeeling-Jalapahar Range; about 15 km away from Darjeeling Town across the eastern valley of Lebong. It is situated at a relatively low altitude; about 1000m at the lower end to about 1320m at the upper end. After the introduction of Panchayat Raj in 1985, the study area of Dabaipani came

hectares. It has a beautiful landscape, where highland descends from the east to the west-facing slope before touching the Balason River valley. It is surrounded on three sides by tea plantations—Montevcot T.E. and Castleton T.E. to the south and Margaret's Hope and Balason T.E. to the north, while, to the southwest and west, Ambootiah and Murmah Plantations are located. The Eastern side is a distinctively non-plantation area, where the St. Mary's Hill stands tall and the western end of the plantation touches the River Balason.

1.4 Methods

I employed a qualitative case study approach (Locke, Spirduso & Silverman, 1989) for achieving the objectives of my research. It consisted of a comparison of two study areas; Mineral Spring and Singell Tea Plantations (R.K. Yin, 1994) on different criteria to be discussed later. Using the case study approach, various tools and techniques (semi-structured interview, non-participant observation, transect walk, group discussion and story narration) were employed for obtaining primary data. Data were also obtained by using secondary sources. These secondary sources consisted of existing literature (books, journal articles and Ph.D Dissertations) on the issues relating to tea plantations, socio-economic conditions of plantation workers and environmental problems in the region. Besides the literature sources, secondary data were also obtained from relevant files, records, maps, photographs and documents related to the research topic.

As a whole, the research design followed a qualitative and case study approach. An interpretative and critical social science paradigm was used for analyzing and interpreting the collected data.

1.5 Limitations

The following limitations were faced in undertaking the research: problems of obtaining permission for research, lack of baseline data, number of interviews carried out, limitations of methods employed, and researcher bias.

The Problem of obtaining permission for research: Due to the refusal of permission from the tea plantation managements to conduct studies in the first and second choices of tea estates, I had to choose a third (Singell) tea estate. In retrospect, however, this third choice proved a good study site for my thesis, although I was apprehensive about the findings till the end.

Lack of baseline data: One of the biggest limitations in my research was the lack of baseline data on the tea estates where the research was conducted. Of the two cases, only one case (Mineral Spring) had some data available but it may not have been gathered systematically. The other case (Singell Tea Estate) had virtually no baseline data for reference due to lack of any previous research there. According to the management, there were no written records or documents available. So, the first hand account of the history of the place had to be obtained by interviewing elderly resident workers and senior management personnel. It seems unimaginable that a tea estate more than a hundred years old did not have a single written record. There could have been unwillingness on the part of the management to reveal anything written. There is known to be a general lack of support or cooperation on the part of tea managements in the Darjeeling District for research on the tea plantation issues for fear of receiving negative publicity in the local papers or journals.

Limitations of methods employed: The main tool employed for the collection of primary data was the semi-structured interview. Conducting a qualitative research study in a place without any baseline data, made the interview method inadequate. By choosing 40 respondents for one-hour

interviews, limited the amount of information generated. Again, a non-participant observation method meant I couldn't get at the inside story of the workers, which perhaps I could have gotten as a participant observer. The limitations of methods led me to use group discussions and story narration techniques to get information on historical aspects of the study sites.

Researcher Bias:

I was born in the foothills of the Himalaya, barely 100 km from my study area. I was also quite familiar with the situations of the plantation community before going to the field. In later years, I worked as a Jesuit in Darjeeling, though not directly with tea plantation people. As a result, I could understand the problems cited in my objectives more easily and I could place myself comfortably in the life condition of the people while being 'non-participant observer'.

Furthermore, I had an advantage as far as familiarity with the place, language and culture of the people under study. These were not bias in negative sense but rather strength and part of the context I brought to the project. Although every effort has been taken to remain objective in the collection and synthesis of the data, it is recognized that no qualitative study is absolutely free of personal bias.

1.6 Organization of the thesis

This thesis is divided into six major chapters. Chapter 1 provides the background and context of the study, and outlines the objectives and methods used in this research. Chapter 2 presents the review of literature on the theoretical frameworks of environmental degradation, community-based management, and sustainable livelihoods. Chapter 3 discusses in detail, different methods employed in this study. In addition, it also discusses the criteria for selecting case study area and describes the study areas. Chapter 4, which presents and analyses the results and major findings

of the study is further divided into three main parts. The first part describes the history of the tea plantation in the Darjeeling area after India's independence and focuses the histories of two selected cases, through comparison and contrast. The second part presents the findings on geo-ecological aspects of the two cases while the third part presents the findings on socio-economic aspect of the communities in these selected cases. The chapter 5 of the thesis discusses the impact due to developments of tea plantations on natural resource bases (forest, land etc.) in the form of deforestation or reforestation and landsliding and soil-erosion processes. The second part of the chapter focuses on the socio-economic impact of the plantation by discussing their changing roles in recent decades that are either leading to over-dependence on the plantations or anxiety of uncertain future in plantation work. The third and the last part of the chapter discuss some institutional and adaptive strategies that have been adopted in these two cases as responses to the prevailing situation. Chapter 6 presents an action plan, appropriate and deemed more effective in the changing situations of the plantations of the hills of Darjeeling. It recommends a community-based development approach, change in top-down management system, introduction of poly crops in tea plantations, combined involvement of NGOs/Govt. organizations, integrated institutional approach, active roles of government agencies and further research in order to ensure sustainability of the society, economy and ecology of the Darjeeling Hills.

Chapter 2: Literature Review

2.1 Introduction

The objective of this chapter is to present background on the following key concepts: environmental degradation, community-based resources management, sustainable livelihood and sustainable livelihood in the tea plantations. The review of the above-mentioned literature themes, done in the context of a mountain environment, provides a conceptual framework for my field research and provides definitions of forms and concepts. There are particular references to literature dealing with environmental decline and degradation of the Himalaya and how the socio-economic status of mountain communities is related to these changes. In addition, attempts are made to identify the role that my study might play in filling the gaps in previous research.

2.1a Environmental Degradation

Environment can be defined as that part of the earth that provides the physiological necessities of life; namely, food and other energy, mineral nutrients, air and water (Odum, 1989). Environment can also be understood as a concept of wholeness, with non-living and living components interdependent among themselves as a sum total of all conditions and influences that affect the development and life of organisms (Pant & Khanduri, 1998). A 'mountain environment', while similar in many respects, has some unique characteristics as it constitutes high and sloping lands, low lying valleys, forests and vegetation of varying types, as well as river beds and meadows. These unique features of mountain environments tend to be quite sensitive to disturbance and disruption by external factors (Cole & Sinclair, 2002; Berkes & Gardner, 1997). Often questions are asked as to when an environment becomes degraded? What are the indicators of an environmental degradation? According to some environmentalists, the presence of different

ecosystems, as well as different values placed on environmental resources by different societies, make the definition of environmental degradation difficult and complex (Adams, 1994).

According to Wilson (1998), environmental degradation is an adverse alteration of a natural system's integrity, diversity or productivity. In an ordinary sense, an environmental degradation is a process of degeneration of elements and factors pertaining to the conditions and circumstances of life on the planet earth (Odum, 1989). It is an undeniable fact that many of the most obvious and severe disruptions of the natural environment happen due to an over-exploitation of resources, thus irreversibly impacting the landscape and degrading the environment (Craig *et al.* 2001).

The degradation of a mountain environment becomes more crucial and critical because it causes major ecological concerns for already sensitive mountain ecosystems, and impacts surrounding lowland through flooding and sedimentation (Tiwari, 2000). Various factors are responsible for the degradation of mountain environments: deforestation, agricultural land use changes, road building, chemical and other air pollutants. The Brundtland Commission, in *Our Common Future*, describes deforestation as "environmental trends that threaten to radically alter the planet, that threaten the lives of many species upon it, including the human species" (Brundtland 1987, p. 2). In much of the literature, deforestation is considered as one of the most important factors in the environmental degradation of the Himalaya because loss of forests directly or indirectly results in the loss of vegetation, loss of biodiversity, decline of fodder, loss of wildlife habitat, soil erosion, a declining water table, drying of springs and other forms of natural resource depletion, not to mention the destruction of medicinal plants and herbs (Sarkar & Lama, 1986; Colby, 1991; Schickhoff, 1995; Tiwari, 2000). In many parts of the Himalaya,

deforestation has taken place; in the form of commercial logging, clearing of forestland for settlement and agriculture, excessive exploitation of forests for fuel wood and fodder, and overgrazing and burning of regenerating forest areas by local people (Ives & Messerli, 1989; Schickhoff, 1995; Awasthi *et al*, 2003). Consequently, the Himalaya, which once presented a storehouse of bio-diversity, wildlife, forests and vegetation of different types, have been denuded of forests in many places or have been left with only scattered patches of vegetation. Generally, landslide is considered to be the result of deforestation and poor farming practices. But some photographs of landslides taken in the Nepal Himalaya will invariably show that these landslides have been initiated by roads or heavily used trails (Ives & Messerli, 1989).

The research conducted by Ives and Messerli (1989) demonstrates that, claims about the environmental deterioration of the Himalaya in the Middle Mountains of Nepal, have been exaggerated and lack factual substantiation. In fact, as they demonstrate, the loss of forest areas in the Nepal Himalaya, which was reported as having occurred in just two to three decades, actually occurred over a much longer time span (Ives & Messerli, 1989).

Another important factor generally considered responsible for the degradation of the Himalayan environment, is over-population. This phenomenon has led to growing land pressure and loss of land-cover due to increasing human activities. Rapid population growth in the Himalaya high lands is causing an increasing demand for food, land-use, deforestation, destabilization of slopes, and exploitation of various mountain resources through deleterious activities (Tiwari, 2000; Kaniyal, 2003; Nusser, 2000; Schickhoff, 1995). When the populations grow beyond the carrying capacity of the environment, degradation begins (Odum, 1989). In addition, when

human population interferes with existing patterns of land use, and engages in various deleterious activities, the environment is damaged beyond repair—evidenced in some parts of the Himalaya (Tiwari, 2000; Kanyal, 2003). There are numerous instances where the over-populated communities, through *jhumming* (shifting agriculture) and other land use practices, have caused water run-off, accelerated soil erosion in the slopes and other catastrophes in the Himalaya (Gardner, 2003; Pant & Khanduri, 1998). But Ives & Messerli (1989), after years of research in Nepal, proposed, “that some of the most densely populated and extensively terraced land in the Middle Mountains probably experience some of the lowest rates of soil erosion and land loss”. They further add that “a very real danger of soil erosion and slope collapse would arise if such areas were abandoned just as degradation can arise from increasing population” (Ives & Messerli, 1989).

Various terms such as ‘ecological damage’, ‘ecosystem disruption’ and ‘ecosystem destruction’ are used more or less synonymously to refer to the degradation of physical environment—often without any reference to human population. Yet ever increasing population cannot be excluded, as it forms an integral component of the physical environment. So, even as humans are one of the primary causes of degradation, they are also one of the most important species to be impacted upon by degradation (Adams, 1994). In other words, when the ecosystem of a place is broken, it leads to the degradation of the physical environment and also the living environmental conditions of the human community (Wilson, 1998). In India, with a population of over one billion people, Himalayan resources are depleting alarmingly due to population’s growing demand for food, water and other basic necessities (Sarkar & Lama, 1998). And due to poverty,

many households have had no other option than to use forest and other mountain resources to meet their immediate basic need.

Blake & Brookfield (1987) have argued that soil degradation and erosion are the result of a set of decisions about land use made over time by land users. Many researchers also argue that activities of small farmers are responsible for land degradation in the mountains that eventually causes floods and accelerated erosion. Ives and Messerli (1989) claimed that deforestation and agricultural practices of local farmers caused by far the greatest land degradation, although, this claim has been refuted by some other researchers (Hofer, 1993; Tiwari, 2000). Tiwari (2000), for instance, argues that mountain farmers with years of experience always avoid slope areas for cultivation or use terraced cultivation that causes minimum erosion. Moreover, in many parts of the Himalaya, natural conditions such as steep mountain slopes and a continuous four-month rainy season further aggravate the erosion problem (Sarkar & Lama, 1986).

This debate, however, neglects another critical aspect of the problem, namely, developmental activities that have been primarily responsible for the degradation of any mountain environment, especially the Himalaya. There is an intricate relationship between development and environmental degradation. Different activities, carried on in the name of development, lead to deforestation; this may in turn cause soil erosion, landslides and other geo-ecological problems (Tiwari, 2000). In India, governmental and other agencies have depended upon the rich natural resources of the Himalaya for the country's socio-economic development. Consequently, commercial timber logging, be it for railway sleepers during the British period or selective felling and the illegal timber business for profit-making in the post-independence period, have

proved to be detrimental to the environment and have brought about ecological imbalance in the mountain region (Ray, 1966; Dogra, 1983). While activities initiated by the British caused large-scale deforestation, Gadgil and Guha (1995) have maintained that the Himalayan environment has degraded far worse due to subsequent Indian government-sponsored activities carried out in the name of development and industrialization. But the degradation of land/forest are normally result of not just one period but rather cumulative effects of the past and the present (ongoing) activities. Developmental activities aimed at urbanization are related factors causing over-exploitation of mountain resources. In the Manali region of Himachal Pradesh, activities aimed at attracting tourist led to increased developmental activities, such as making of more roads and many hotels at different point of the town (Cole & Sinclair, 2002). In Darjeeling, too, developmental activities, meant for making the town less crowded, led to more spaces being created for vehicle parking, bigger houses being built and more lodges/resorts being constructed, all in the name of development of Darjeeling Town (Khawas, 1998). In the Himalaya, there are enough data to show that the onslaught of modern technological growth over recent years is leading to soil being exhausted quickly, rapid loss of run-off water, heavy siltation and eutrophication of lakes in the region (Chada, 1990). A great degree of landslide problems and environmental degradation seem to occur along heavily travelled roads, around hydro-electric projects and mining (coal) areas, above areas of dense human settlement and tourist development, and around dams or reservoirs (Ives & Messerli, 1989; Chada, 1990; Sharma & Kumari, 1998; Bernard *et al*, 2001). For centuries, the Himalaya—with spectacular scenery and cooler climate —have attracted pilgrims and tourists. But in recent decades, a huge increase of domestic tourists, and to lesser extent Western tourists, is seen in the many ‘hill stations’ during summer. This enterprise, while bringing some much needed economic benefit for the mountain

community, is proving to be detrimental to the ecology of the region. So, while welcomed economically, the tourism industry is posing an eco-threat to the Himalayan environment due to overcrowding by tourists, vehicular pollution, hurriedly built structures, insufficient supply of water and energy and inadequate waste disposal which degrade and damage to the physical environment of the Himalaya (Gardner, 2002). Whether, intentional, or unintentional, this has caused an ecological crisis; human exploitation of resources is occurring at a greater rate that can be normally regenerated under natural conditions (Pant & Khanduri, 1998). While, in general, there could be a similar mechanism operating in the degradation of any environment, the degradation of a mountainous environment follows a pattern that occurs as a result of succession of related activities that culminate in ecological damages. Hence, the cycle of degradation may be represented as following population growth, leading to increased demand for food and fuel, leading to deforestation, leading to soil erosion, leading to landslides and floods (Sharma, 1990; Rustomji & Ramble, 1990). In spite of the problems of deterioration, the environmental situation in the Himalaya is not that grim as some literature make it out to be.

2.1b Community-based Natural Resources Management

Community-based management includes management of local natural resources by those living in the area. It is a process to involve/incorporate the local people as stewards of 'common' resources by instilling in them a sense of ownership. According to Wescott (2001): "the prospects of community-based management is hypothesized to depend on people's attitude towards collective action and their evaluation of the capacity of local institutions to facilitate the functioning of such a management regime". In the past, government and other agencies had practiced management of resources through a command-and-control system, based on the

principle of conserving the common resources but also on the principle of preventing the general public from having access to these resources (Peet & Watts, 1996). In Western India and the Philippines, the policy of excluding the public and designating 'reserved forests' as "no access" zones has backfired, leading in fact, to even greater loss of natural resources (Berkes *et al.* 1998). Generally, it can be said that this practice, not only leads to the inaccessibility of the forest resources to outsiders, but also causes frustration in the local community who feel alienated from the nature to which they were traditionally intimately connected. This eventually leads to the destruction of 'commons' (or at least their access) through illegal means; thereby, causing eventual depletion of resources (Duraippah, 1996). In recent years, a significant shift has taken place in the strategy of managing natural resources in that the local communities are more involved as custodians of natural resources in their vicinity. This has given rise to the community-based management approach; an essential feature of the emerging face of strategies aimed at the conservation of natural resources (Kilpatrick, 2003). The new emphasis is on a more self-organized or self-managed system in which power has devolved to the local community (Loikkanen *et al.* 1999). Countless experiences in both developed and developing countries have shown that, unless local communities are involved in protection and conservation process, natural resources are doomed (IVCI, 1996). Therefore, conservationists and resource managers are now trying to find a way for more effective management of resources through participation in governance by the people most directly affected (Pound *et al.* 2003). Many conservationists are of the view that either "we pursue the conservation of local resources and people's livelihood needs or we involve the local resource users as potential conservation allies and look for common objectives that would serve conservation while at the same time producing community benefits" (Holling *et al.* 1996).

One of the most effective ways of involving different stakeholders is the participatory style of management, which requires partnership between the resource managers and the resource users; i.e. the local community. According to Berkes (1999), the local communities as resource users themselves are the 'managers'; they identify themselves as members of a local community and not as resources managers answerable to their peers or an agency. Since local communities and indigenous groups are dependent upon those resources for their some or entire livelihood, there are pragmatic reasons to engage them—not just in discussion or decision-making but also in the practical management of natural resources (IUCI, 1996). This strategy is very well practiced in some farming communities. For instance, in the management of agricultural land and crops, participatory action research and 'bottom up' extension can tap into farmers' 'indigenous technical knowledge' or local knowledge of things such as weather cycles, vegetative growth and the best use of land (Kilpatrick, 2003).

For better management of local resources, there is a greater need to share the resources with local people and make them 'stewards' of the resources, while at the same time giving greater recognition to their indigenous knowledge and experience in the management of human-ecosystem interaction (Colby, 1991). This approach should be based on the reasoning that community-based management depends on the knowledge of the indigenous/local community of natural history who has their own understanding of ecological relationship and system of managing resources (Berkes et al, 1998). Berkes (2003) also stresses that promoting sustainable use of any natural resources; an OSY (optimum sustainable yield) approach needs to be adopted because it necessitates a process of reaching consensus on the most appropriate objectives;

thereby allowing people to make environmentally prudent decisions. However, in order to efficiently manage the resources, there is a need for community- based institutions, an appropriate policy environment and willingness by two or more parties to engage in participatory management (Berkes, 2003). According to Kothari (1996), the local communities are involved in the management of local resources such as forests and land; then besides having access to those resources, they will become responsible custodians of the same resources.

Mountains endowed with rich natural resources need to be protected and preserved for future generations and also for the very survival of mountain environment. A question often raised at this point is: which community should be entrusted with the management of which resource? ‘Hill People’, as those from the plains generally refer to them, are deft at managing their resources due to traditional dependence upon and constant interaction with their surroundings. Their dependence on the mountain environment includes reliance on forests, water sources and arable land for livelihoods. Some communities, notably in the western Himalaya, have achieved great success in the management of various natural resources in their vicinity. Management of resources requires collective decision-making and the enforcement of agreed-upon rules and in this endeavour Nepalese local social structures and institutions can play a critical role (Berkes *et al.* 1998). In the Western Himalaya, the ‘*Pahari*’ community traditionally practiced community stewardship of local forests through their own social-organization long before the local government introduced this community-based management concept. What was required was for government to recognize those social organizations and entrust the community with the responsibility of managing their own resources/assets. Often this has failed in India because of apprehension in the part of the government agencies that tend to make regulations without

consulting or involving local communities. But some conservationists also raise reservations regarding community-based institutions that are entrusted with managing 'common' resources. Berkes (2003), for example, points out, that, local community-based institutions are only one level in a complex, interrelated system, and a level that is often ill equipped to deal with the issues. In the case of the management of the Himalayan natural resources in general, and the Darjeeling Hills in particular, similar apprehensions have been raised. Local people have not been consulted or included in the decision-making processes for the management of resources such as forests, wildlife, water, and land or tea plantations.

But we also need to be reminded that, "community institutions are not for solving resources management problems but to provide flexibility for the community in enabling them to pursue their livelihoods" (Berkes *et al.* 1998). Today, recognizing that command-and-control management systems have failed to protect the valuable resources of the Himalaya, it seems logical to experimenting with entrusting the stewardship of natural resources to local people through community-based management.

2.1c Sustainable livelihood

At a very basic level, sustainable livelihoods are about the ways in which individuals and collectivities of individuals, use resources in order to survive, prepare for and respond to the effects of socio-economic and other changes (Craig, 1997). Chambers and Conway (1992) define sustainable livelihood as a process that comprises the capabilities, assets and activities required for a means of living while not undermining the natural resources base. All of these elements are

necessary to make a community's livelihood sustainable. If the capabilities and activities are present, but assets are missing or diminished, the livelihood of the community will be affected. In the Himalaya, the people have always depended on the land and forest for their livelihoods. In the western Himalaya, as also in many other parts of the Himalaya, agriculture and animal husbandry form the primary basis for people's livelihood (Sinclair & Ham, 2000).

It is accepted that, in principle, sustainable livelihoods offer different strategies to be used to deal with or tackle the problems. These are measured in terms of an individual or community's capacity to respond to a crisis—by means of positive or negative adaptation strategies. However, when a community's livelihood, directly or indirectly, depends on mountain resources, even these strategies may fail to ensure the economic sustainability of that community. Traditionally, the people of the Himalaya have been using land, forest, and other resources as their means of livelihood. In recent decades, though, due to an expansion in the tourism industry, livelihood options in the region have increased. There are, for example, jobs in the tourism sectors, hotels and other small time related works. This has not however, diminished reliance on natural resources for the people living away from urban centres. Failure in the sustainability of livelihoods and environmental degradation are intricately connected because the shortage of livelihood options can lead to the destruction of available natural resources (Rawat, 1995). And, since the livelihoods of the people in the Himalaya largely depends on land and forest (i.e. their whole physical surroundings), a “threat to biophysical sustainability causes threats to the economic and social well being of the people” (Berkes *et al.*, 1998). Scholars such as Tiwari (2000), Rawat (1995) and others, have acknowledged that it is the scarcity of resources and, therefore, lack of sustainable livelihoods for the growing population in the Himalaya that has led

to the exploitation of land, water, forests and other natural resources. Another view holds that it is the market-driven demand for higher food production that has led to intense land use and the application of chemical fertilizers, that eventually leads to the degradation of land and water (Brown & Shrestha, 1998). It can also be argued that, in the Himalaya, environmental degradation has occurred to such a large extent, as a direct result of a shortage in livelihood options. This further affirms the fact that here is a vital link between environmental and socio-economic systems. This often leads to a conflict between preservation of ecosystem on the one hand and economic development on the other; break down in the system or failure to maintain the healthy interface between ecosystem and economic development can result in the degradation of environmental as well as human poverty (Adams, 1990). In the mountain environment, it can be demonstrated that low levels of economic development can lead to environmental degradation, which, in turn, can undermine and frustrate economic development.

The livelihood approach views the ongoing conservation of resources as an integral component of the sustainability of livelihood (DFID, 1999). But the sustainable livelihood approach also values social sustainability and equity, and prioritizes the interest of the poor (DFID, 1999). It is important to note that livelihood cannot be valued solely in terms of money. One's livelihood may or may not involve money but it does include the wide and diverse range of activities people engage in to find sources of food, fuel, animal fodder and cash to make or improve their living (UNDP, 1999). In some parts of the Himalaya, livestock constitutes an important economic element, as cows can fetch income through milk and also provide manure for cultivation (Ives & Messerli, 1989; Kaniyal, 2003). People need to sustain this source of economic gain even if it entails lopping of leaves from forests or grazing upon newly regenerated vegetation (Duraiappah,

1996). But, the continuing degradation of natural resources leads to the drying up of springs, irrigation of less land and, finally, a decline in crop productivity; as a result, the livelihood options of the people are seriously affected (Rawat, 1995; Sarkar & Lama, 1998).

In the more organized sectors, like the plantation industry, institutional sustainability is of paramount importance for the sustainable livelihoods of the dependent community. Sometimes peoples' livelihood becomes unsustainable because the institutions that form the basis of their livelihood themselves become unsustainable as a result of the failure of prevailing structure and processes to carry on its functions over the long term (OFID, 1999). For the people, dependent solely on one source for their livelihood, such as in a plantation-based economy, the breakdown in institutional sustainability may lead to serious socio-economic problems. Livelihoods for these communities in a more structured setting will be sustainable only if the following factors are present: a) communities are not dependent upon external support; b) communities maintain the long-term productivity of natural resources; c) communities do not undermine the livelihoods, or compromise the livelihood options, open to others (DFID, 1999). But once the role of these livelihood support systems declines or changes for the worse, hardly any options remain for the dependent community—except to fall back on forests and other natural resources for their livelihoods.

2.1d Livelihood Sustainability in Tea Plantations

In India, tea plantations are one of the many kinds of plantations, such as coffee, cinchona, rubber, banana and others. But, perhaps no other plantation are as well organized as the tea plantation; also no other plantation, provides as many employments as does the tea plantation

(Duncan, 2002). It is estimated that in the tea plantations of West Bengal alone, more than a hundred thousand workers are employed. In India, surveys have revealed that the tea industry has also “provided indirect sustenance to many people in hill areas by supporting several ancillary avenues of employment, for example, agricultural tools, tea chests workshops related to various operational aspects, repairs and maintenance and, last, but not the least, transportation” (Ghosh, 1987).

Darjeeling is known worldwide for one thing—tea plantations that produce the best-flavoured tea in the world. Even today about 52,000 men and women directly or indirectly obtain their livelihoods from plantation work. Unfortunately, the Darjeeling tea industry of about hundred and fifty years is no longer able to support the livelihood of increasing population. Many writers generally believe that agriculture and livestock form the basic livelihood sources the Himalaya (Ives & Messerli, 1989; Kanyal, 2003). The Darjeeling District, too, has areas where these two components are most important sources of people’s livelihood. But Darjeeling may be predominantly a tea plantation area; the socio-economic condition of tea plantation community is very different from a village community. The reason being, most of the households obtain their wages and other benefits from plantation work and for most households that forms the only livelihood source. And, since tea workers have no ownership right to the land they occupy, they may not be able to engage in agriculture nor raise livestock to diversify their livelihood sources (Subba, 2001). Unfortunately, the presence of tea industry has also proved itself to be a big obstacle in the progress of the hill society. The absence of any other large industries—with the exception of tourism in recent years—underlines the fact that the tea lobby had virtually blocked the entry of any other alternative industry in the region for fear of losing the cheap labour force

(Bhomik et al., 1996). Though, in the last three decades several small industries have emerged in many parts of the district but they are away from the plantations and mainly cater to village and small urban centres. Again tourism developed due mainly to provide viable alternative livelihood for a large population. This has had negative impact on the peoples' search for livelihood alternative and has often led to using forest and other resources. These poor socio-economic conditions of the tea estate people have the potential to become a serious threat to ecological processes if the sustainable livelihood is not available (Chettri, 2000). In this study, the term 'sustainable livelihood' is used to mean all the efforts of the tea plantation community of the Darjeeling Hills put in, to generate and maintain, not only the means of survival but also to enhance their living standard.

The key points reviewed are environmental degradation, community-based natural resources management, sustainable livelihood and sustainable livelihood in tea plantations. All these aspects have prominent presence in the study areas I have selected in the Darjeeling District of India. Being part of Greater Himalaya, the mountainous part of the Darjeeling District has witnessed and continues to witness environmental degradation. One of the main causes in the past has been lack of resources that provided sustainable livelihood to the people. This has often led to finding livelihood in forest resources and further aggravating the geo-ecological conditions due to deforestation that occurred after extensive felling of trees. One of the other main factors that diminish peoples' socio-economic conditions is the lack of ownership right in tea plantations that would empower them to manage their own resources. Tea plantation, though very different from managing forest resources, calls for management of tea resources through community

based management approach. Thus, main points reviewed in the literature are deeply related to the problems of the place and the people of my study area.

Chapter 3: Research Methodology

3.1 Introduction

The field study was undertaken between mid-September 2004 and mid-January 2005 (Table.1). The study, seeking to describe the impact of tea plantations on the socio-economic conditions and geo-ecological aspects in the Darjeeling District, examined and sought insights into the nature and extent of the problem on hand. In order to further explore into the research problem, in-depth interview was used in conjunction with other methods for obtaining qualitative data. A case study approach was chosen as the main methodological strategy. A case study approach enables use of the inductive method, where general conclusions may be drawn from particular facts. Working within the realm of qualitative research involved living in the two study areas and interacting with the community members and seeking their perspectives.

3.2 Comparative Case Study

The research entailed comparison of two tea estates. Two cases, namely Mineral Spring and Singell Tea Estates, were selected for a comparative analysis. This was achieved by dealing with a variety of sources— documents, artifacts, interviews, and non-participant-observation as any qualitative research necessitates (Yin, 1994).

Criteria for selecting 2 cases

The selection of these two plantations for the case study was based on the following criteria:

(a) *different location of tea estates*: they were located quite far from each other at similar altitude (1500-2000m) but in different contexts— Mineral Spring was away from urban area while Singell, adjacent to a river valley, was very close to Kurseong Town , a relatively urban centre;

(b) *different management systems*: Singell has a typical command-and-control or top-down management system while Mineral Spring had co-operative or a community-based management system; (c) *Socio-economic considerations*: The majority of the people in Singell were dependent on tea plantation work, while the community of Mineral Spring was dependent on cash crops, apart from the sale of tea leaves and off farm employment for their livelihood; d) *Presence or absence of social organizations*: Besides the community level social organizations in both places, Mineral Spring had *Sunjukta Vikas Co-operative* (community-based organization), while people in Singell Tea Estates were part of trade unions.

The rationale behind choosing these two cases was that they presented a contrasting picture with regard to location, management systems, socio-economic status, and the presence and /absence of social organizations in the respective places. Though located in areas with similar climatic and geographic conditions, they were different in many respects. Singell Tea Estate, situated in the Kurseong sub-division had proximity to relatively large town on one side and a fast flowing river at the other side. This location has a likely impact on the pattern of land uses as well as livelihood options. On the other hand, Mineral Spring, situated far from the urban area, had relatively smaller population. Hence, people there had less off-land employment options near their hamlets but also much less farm land pressure. These factors provided ideal setting for comparative case studies. In addition, the operation of two different management systems created an ideal setting for comparing and contrasting the socio-economic conditions of two communities.

3.3 Tools for Primary Data Collection

For the collection of primary data, the following tools and techniques were employed: in-depth interviews (semi-structured and unstructured), non-participant observations, story narration, transect walks and informal discussions. Interviews are one of the most important sources of case study information (Yin, 1994). The qualitative research design generally employs three techniques for conducting interviews: structured, semi-structured and unstructured or informal (Morse & Field, 1995). I employed semi-structured interviews with all the subjects for collecting the primary data. One advantage in the face-to-face interview in semi-structured or unstructured forms is that there are more chances for clarification for the interviewer as well as the interviewee whenever some ambiguities arise.

3.3a Semi-structured Interview

According to Chambers (1994) semi-structured interviews entail having a mental or written checklist, but being open-minded and following upon the unexpected. Though the respondents were asked a set of prepared questions, the interview followed a more flexible approach. Questions were modified according to the flow of the interview and responses of the interviewees. All interviewees were asked the same questions—only the pattern of interview was adapted according to the interviewees. That is, though same questions were asked to all participants, interview questions were not asked in the same order if the interviewee deviated from the questions asked (Appendix: A/B). Semi-structured interviews permitted a greater degree of interaction between the interviewer and the interviewee. In addition, this interview format allowed for greater flexibility for interviewees to expand on different subjects and recount different experiences relating to the study. A total of 40 face-to-face semi-structured interviews

were carried out in each study area so that about 80 individuals were interviewed in two-study areas.

Interview subjects were selected from the following categories: tea plantation management, plantation working class/clerical staff, plantation labour class, tea farmers, non-plantation residents, NGO representatives and other key informants. The following variables constituted the criteria for selecting the respondents: educational level, gender, age, caste, and work position. The rationale behind choosing a total of 80 subjects for interview from diverse categories was to ensure varied and cross-sectional responses besides removing the apprehension of a predictable response from a homogeneous group.

Since, respondents were required from above mentioned categories, they could not be selected randomly. Hence, the researcher spent first few days, interacting with different individuals and visiting different households in each study area. Thereafter, potential/prospective subjects for the interview were identified. It was followed by contacting the participant and explaining the purpose of his or her participation for an hour, face-to face, interview after obtaining the oral or written consent, the appointment for the interview was scheduled. Of the 40 respondents in each case, 35 were workers while the rest 5 comprised representatives of management and outsider (key informant). In Singell Plantation, 17 were female and 18 were male among the 35 workers selected as respondents; 11 respondents belonged to youth category (19-35 yrs), 15 respondents belonged to middle age/adult category (36- 59 yrs) and the 9 belonged to senior resident category (60+ yrs). In Mineral Spring Plantation, 19 were female and 16 were male among the 35 workers selected as respondents; 10 respondents belonged to youth category (19-35 yrs), 15 respondents

belonged to middle age/adult category (36- 59 yrs) and 8 respondents belonged to senior resident category (60+ yrs). Majority of the respondents of Mineral Spring were agriculturist-cum- tea cultivators while a small number of them can be categorized as village shop owners, middlemen, school teachers, retired army men and daily wage earners. In each study case, 5 respondents were non-workers. In Singell Tea Plantation, 4 respondents were managers/asst. managers while 1 respondent was an outsider from Kurseong Town. In Mineral Spring Plantation, 2 respondents were representatives of community-based tea management organization (SVC), 1 respondent was TPI Ltd, management representative while the rest 2 were from Darjeeling Town.

At the outset, the participants were made aware that direct quotations from the individual, semi-structured interviews would be used for illustrative purposes, and every effort would be taken to ensure that their identity would not be made known. The participants were also informed that the contents in the notebook or the digital tape recorder (on some occasions) being used to record their responses would be erased or shredded off on completion of the research. The participants of Mineral Spring had no problem being quoted even with their real name, while some interviewees in Singell Tea Estate wanted to be anonymous while talking about the current management.

3.3b The Non-Participant Observation

The Non- Participant Observation is a method of data collection whereby a investigator attempts to attain some kind of membership despite a degree of detachment from the group under study, and thereby, attempts to adopt the perspective of the people in the situation being observed (Frankfort-Nachmias & Nachmias, 1999). Despite living amongst the community, the researcher

adopted a non-participant observer's role, in order to avoid subjective bias from creeping into the data (Table 1)). While this method functioned as lower level of primary data collection, it greatly helped in supplementing, corroborating and crosschecking the data obtained by the semi-structured interviews. This tool was used to crosscheck through direct observation what interviewees said with what the reality was regarding their economic conditions or geo-ecological issues in their places. Sometimes, the researcher tried to observe landslides and soil erosion around individual houses and hamlets and took notes. The researcher also tried to observe external conditions of households, presence or absence of livestock and land holdings by different households, so as to assess the economic standing of the families. In order to facilitate data collection through this method, field notes were taken for further interpretation. Moreover, researcher's live-in experience in the families of the selected study areas functioned as experiential observation.

3.3c Transects walk/ Field mapping

This data collection method was employed for the verification of the respondents' responses through personal observations. It required visits to the spots and places where landslides/soil erosion had occurred. In both study areas, some individuals along with the local guides were, asked to accompany, in order to verify somewhat contradictory responses regarding the occurrence and non-occurrence of landslides or their size (Table 1). The investigator took notes after verifying the occurrence or non-occurrence of landslides/soil-erosions besides comparing their size with other observed incidents. Transect walks often included photography of the impacted spots by digital camera. Photos obtained from digital camera were used for comparing and contrasting with the old photographs/maps of the past. In addition, transect walks were

employed to observe the latest physical impacts in one study area and in its surroundings, in order to compare and contrast with the observed phenomena in the other study area.

3.3d Story narration

This technique was born out of a lack of written history of the study areas (Table 1). About 10 elderly residents (65 yrs and above) in total were asked to tell their story of the past by recalling their experiences. These stories were recorded and used to corroborate with those of some key informants and with some written documents, if available. Moreover, they were asked to narrate their experience of changes they had seen over the years with regard to socio-economic condition of the place as well as forest cover and landslides events. This was later used to triangulate the data, already obtained through other primary and secondary methods.

3.3e Informal discussion

This technique was occasional and unplanned. On evenings, whenever, some people and university college students came to see the researcher, informal conversation would turn into discussion on the questions being raised during the interview. Often the local guides were instrumental in initiating these informal discussions on socio-economic conditions of the people and the present state of the local environment (Table 1). This generated rather good discussion on the local issues concerning peoples' lives. The researcher mainly asked some probing questions on some most pressing needs of the community and whether any measures are being taken to address those problems. Later, some points from these discussions were written on field notes. The most interesting aspect of discussions was the follow up of evening discussion (on

few occasions) by about twenty passengers traveling by jeep to Darjeeling Town. The researcher took note of some points that came up in the discussion.

3.4 Secondary data sources

Considerable reliance were placed on secondary data sources including from books, journal articles, news articles from local newspapers, websites, historical records, and other data some non-government agencies. The books dealing with the history and problems of tea plantations in North Bengal in the past and recent years were used extensively. In addition, some relevant articles published in journals, and University thesis/doctoral papers. As well, the already obtained data, research publications, and records of the some significant geo-physical events contribute to assessing and comparing the data obtained during my fieldwork.

Most of the secondary data sources in the form of books, research documents and publications were obtained from the libraries of St. Joseph's College, Darjeeling, CREATE (St. Joseph's research wing) and North Bengal University. The office of an NGO (RCDC) also provided some valuable documents for the study, while some old letters and booklets were obtained from the case study areas. For the latest developments, some reliable online articles were also consulted. Moreover, the old and current literature, documents, study records, maps/photographs, and files were explored at other related sources and institutions such as Himalayan Mountaineering Institute and Darjeeling Planters' Association.

3.5 Data analysis

After the field study was complete, records of Nepali interviews, kept in two journals, first were translated into English before being transcribed. Thereafter, the data obtained from interviews, observations, transect walks, and other research techniques and sources were classified by content categories. The specific content categories were developed under three-research areas: geo-ecological aspects in selected plantations, socio-economic conditions of the community and institutional responses. The history of tea plantations in the Darjeeling District addressing the first objective was obtained from various secondary sources and supplemented through story narrations by elderly/ senior residents and key informants in the study areas. Later the quantifiable data were coded and were transferred into Microsoft Excel in the form of spreadsheets. Using different variables, already prepared in Microsoft Word, the data were entered onto spreadsheet. Later, the data entered in the Microsoft Excel were converted into tables and histograms.

Table 1: Summary of Qualitative Research Methods

Methods	Activity
Semi-Structured Interviews	This was the main technique I employed to collect primary data. A total of 40 semi-structured interviews were conducted in each study cases. The guide questions were developed after the initial informal and pilot interviews before formatting more specific questions.
Non-participant Observation	From 10 September 2004 to 12 January 2005, did field study in two plantations, located in the Darjeeling District. I actively observed the daily activities of the people, without physically participating. Plucking of tea leaves, peoples interaction with others, households working in the fields, collection and weighing of tea leaves, activity involving harvesting of cash crops as well as transporting to urban centres for sales we very keenly observed while at the same time listening to the type of conversation. However, it was not easy to be quiet observer as people tended to feel uneasy while being observed without striking some conversation.
Transect walk & Photography	In case study areas, once a week, some key people, such as assistant managers and welfare officers in Singell and presidents/secretary of village organizations in Mineral Spring were requested for transect walks. This was to observe and verify some spots of landslides/erosion as well as vegetation. This followed taking of pictures of those spots with digital camera.
Informal Group Discussion	These discussions were impromptu. Often in evening gathering at house of my hosts some local people or college students dropped by ordinary conversation

	<p>would turn into discussion centred around the questions asked during interview. By recognizing the values of such group discussions, the researcher tactfully engaged the group in discussing the environmental as well as socio-economic issues of the places. The main disadvantage of these informal discussions is that, they tend to be unpredictable, due to the interest, mood, place and number of participants.</p>
Story Narration	<p>In addition to interviews and discussions, story narration technique was occasionally employed mainly to obtain the history of the place due to lack of written records. Most of the people (men and women) were elderly people over 70 years old. This technique was often preceded the interviews or done during informal discussion so that even the other people present could ask some probing questions. It was done for getting the incidence of deforestation or landslides as well for comparing the present economic condition with the past.</p>
Respondents	<p>Given the time limit of the field study, some key informants contacted in advance. In Mineral Spring, past and present NGO personnel, including the director of the first NGO to work in that place were the key informants. In Singell T.E., assistant manager (native of the place), a former welfare officer and some retired workers were key informants. Moreover, in both cases some were senior residents considered key informants due to their vast information/ knowledge gathered through experience or observation.</p>

Chapter 4: Development of Tea Plantations in the Darjeeling Hills

This section, describes the evolution of tea cultivation under British administration and its growth after India's independence. The second part of this chapter describes the historical development of two selected tea estates, while the third part compares and contrasts the growth, decline and revival (if any) of the two cases.

4.1 History of Tea Plantations in the Darjeeling Hills

The history of the Darjeeling Hills before the annexation from the kingdom of Sikkim into British Bengal is buried in the past due to lack of records. It is, however, believed that indigenous hill tribes, like Lepchas and Sherpas, were the first people to set foot in these hills, their livelihoods consisting of fruit gathering and hunting (O'Malley, 1907; Biswas, 1990). They also engaged in subsistence farming after clearing and burning of forests. More than a hundred fifty years ago Darjeeling was a very sparsely populated area, with hardly any significance attached to it, except for the battle between Nepalese and Sikkim kingdoms for control over the area (Eden, 1965; O'Malley, 1907). The population of the region was said to be "merely a hundred soul" and according to some travellers' account, the entire region was covered with almost impregnable dense forest (O'Malley, 1907).

When the small village of Darjeeling was annexed to Bengal in 1841, with its hill tracts of about 217 sq. km, it was initially developed as a sanatorium and as amenity centre for the British officials besides being utilized as a key military station (O'Malley, 1907). However, the credit for bringing an obscure place in the Darjeeling Hills onto India's map goes to the tea industry.

As soon as the British began to administer to the area and established the first plantation, the tea business rapidly expanded in the Darjeeling Hills and surrounding areas: "Tea didn't wait for the formation of the Darjeeling District, though rapid development of plantations in this district owed great extent to the consolidation of the British Empire in this region"(Ghosh, 1987, p. 34). After, the Darjeeling superintendent of the time, Dr. Campbell's successful experiment with tea plants in his backyard and success of the first commercial tea plantation, the tea industry continued to expand until the beginning of the 20th century. The growth of tea in India (in the beginning of 19th century) meant that China almost disappeared from the world tea export market. In general, the growth of tea plantations in the Darjeeling Hills is due to the following factors: a) cheap labour, b) available land, c) revenue-free policies in the pre-independence era, and d) special status of the Darjeeling District.

a) Cheap Labour: Tea is a labour-intensive industry requiring, apart from a huge initial investment, a large number of cheap and unskilled labourers. From the outset, labour was never a problem in this region. Hill tribesman in the beginning, and the influx of Nepalese emigrants after 1850 kept the supply of labour flowing to the tea plantations. It is difficult to envisage the development of tea plantations in Darjeeling without the influx of migration from rural Nepal. From recorded accounts, it can be concluded that for the Darjeeling Hill Plantations there was a steady supply of Nepalese labour for many decades which climbed from about 30,000 in 1871-72 to 75,000 in 1951 (in 78 settlements) (Munsi, 1980)). However, in 1961 the number went down to 55,000 and in the next decade (1961-71) it further decreased due mainly to the stagnation of the tea industry in the region but also due to the closure of trade with Tibet (Munsi, 1980).

b) Available Land: In order to encourage more people to invest in the tea industry, the British administration made land available at low prices; often selling some 'wasteland' through open auctions. This enabled the highest bidders to acquire land for cultivation of tea or to expand their existing tea land. However, the agitation by planters against the sale of land by open auction led the administration to introduce leases for 30 yrs for cultivation of tea. This was one of the main reasons for the expansion of tea cultivation land as well as number of tea estates in the Darjeeling Hill, though in subsequent years number of functional tea estates has declined considerably (Table 2).

Table 2: Expansion of Tea Acreage from Pre-independence to post-independence India

Year	No. of tea plantations	Tea cultivation land
1852	1	4.33 hectares
1866	39	3,000 hectares
1870	56	4,400 hectares
1874	113	11,000 hectares
1896	186	16,230 hectares
1943	142	21,075 hectares
1951	138	16, 569 hectares
1971	97	18,258 hectares
1982	84	18,000 hectares
1985/86	86	18,000 hectares
2000-	86	18,000 hectares

Source: Tea Statistics (2001)

c) Revenue-free policy of Pre-Independence era: With the aim of expanding tea cultivation in the area, the British administration enacted policies whereby the tea planters/producers could grow tea without paying revenue taxes, unlike that imposed on other agricultural land-

“From the 1951 Census Report it is found that 146 tea estates were revenue-free covering an area of 74,286 acres as compared to revenue-paying tea estates of 82,127 acres. These revenue-free tea estates consisted mainly of land, the revenue of which were committed under the wasteland Rules of 7 May, 1859. So grant of wastelands put up to auction at an upset price of Rs. 10/acre. So between 1859-62 more than 9,000 acres of land were sold in the hills by Public auctions at an average rate of about Rs. 12/acre. After the passing of WB Estate Acquisition Act, 1953, all the erstwhile freehold right have been extinguished and all the tea estates have been made revenue-paying” (Ghosh, 1987, p. 117).

d) Special Status of the Darjeeling District: After its annexation from Sikkim to Bengal, the Darjeeling District acquired a special status under which it was designated as a non-regulated district, and the land laws of Bengal did not apply (Munsi, 1980). This made the cultivation of tea in large hectares of land, feasible even in the hills. In the pre-independence period, there were virtually no other alternative livelihood options except tea industry to sustain the livelihoods of the local communities. Hence, tea industry played a big role in the initial development of the entire hills of Darjeeling, including the growth of urban centres such as Darjeeling and Kurseong Towns.

The period between the establishment of first tea estate in 1852 and India's independence (1947) saw an unprecedented expansion of the tea plantations. Due to factors stated above, the number of tea estates and the area of tea cultivation steadily increased from just one estate cultivated on a mere 4.33 ha in 1852 to 113 tea estates, cultivated on 11,000 hectares of land in 1874. The number of tea estates in Darjeeling reached its peak in 1895 with 186 tea estates before decreasing, while the largest area occupied by tea cultivation in the Darjeeling area was recorded to be 21,075 hectares in 1943 (Bhadra, 1992). Therefore, between 1896 and 1943, number of tea estates decreased (due to merger or closure) whereas tea cultivated land increased. Apart from the expansion of tea-cultivated land, other developments also occurred that influenced the tea industry in Darjeeling. In 1873, with rapid increase in number of tea estates, the first General Meeting of the Darjeeling Planters was called to consult the problems faced by tea estates in Darjeeling. This resulted in the formation of the Darjeeling Planters Association (DPA) in 1892, which became associated to India Tea Association in 1910. In another significant development, Mr. O'Brian, an engineer, used the power driven tea roller and tea sorter for the first time in 1872, by installing turbines on some tea estates. This changed tea manufacturing in Darjeeling and further helped the growth of tea industry (darjnet.com/Darj/history/tea/teaindus.htm).

The year 1947 was significant not just due to India's Independence from British rule but also because of the transfer of administrative authority for some tea estates to Indian administration. By 1956 change of ownership in a large number of tea estates had taken place (Eden, 1964). Also in a significant move the government established Tea Research Association in 1966; it soon started making clones of selected plants for selective re-plantation. But the post-independent era also witnessed many crises faced by the tea plantations in Darjeeling. In fact, the years

immediately before and after India's independence witnessed fluctuating fortunes as far as tea plantations were concerned. The worldwide depression in 1930s had its bearing on the tea industry in India as well. The post-independence era was not free from financial setbacks for the tea industry in India either. In 1947 and the years that followed WW II saw a lull period and then the tea industry witnessed a phase of recovery after war. Several tea plantations witnessed the change of ownership in the years, following the independence of India (Sharma, 1999). This changeover in turn caused a slump in the industry due to the inexperience Indian planters assuming the management, before recovering with new vigour. In a significant recovery 16th April 1951 saw the reopening of the London Auction. The London Tea Auction was started by the East India Company under the charter granted by Elizabeth I; it controlled all the trading rights and sales of imported tea from China and India (Griffiths, 1967). It was closed temporarily during the First and Second World Wars and during economic depression in Europe. After a long gap when the auction resumed, it led to the return into the field of producers, buyers, brokers, and retailers and a brief rejuvenation of the tea economy. However, as worldwide trade opened up and was made faster with the advent of air transportation, the London Tea Auction became less important. Moreover, different tea producing countries started their own auctions; this led to the decline and eventual closure of London Tea Auction in 1998 (www.barrys-Tea.com/articles/London_tea_auctions.html). Thus, the tea industry was not free from economic crises. The Darjeeling District indeed saw fluctuating fortunes of its tea industry after India's independence.

But the community that was most affected by fortune or misfortunes of tea plantations was the tea plantation workers who were entirely dependent on plantations for their livelihood. That is

why unemployment has been one of the most serious socio-economic problems of the region despite the claim of the tea industry that it absorbs about three-fourths of the population into its work force. Interestingly, in spite of a 'surplus of labour', the tea plantations did not allow a labour market to develop. This had manifold reasons: to keep wages low, to keep the expense on the plantation workers to the minimum, and to control or manipulate the human resources of the region. This led to unemployment on the plantations as the family size of emigrant workers increased while permanent and even casual plantation works remained static (Bhadra, 1992). On the other hand, this strategy helped the management to keep the wages low by employing more casual or temporary workers who were happy to get even meagre pay. This was a very clever tactics used by the tea planters to keep both production and profit at a maximum (Roy, 1965; Ghosh, 1987).

Perhaps the most conspicuous changes took place in the socio-economic level of the plantation community. With the rapid increase in hill population, the 1960s witnessed a gradual decline of employment in tea plantations. Some of the reasons for the increase in unemployment have been discussed above. Moreover, with the departure of British planters and entry of Indian planters--even after the tea economy started improving--the poor working and living conditions of plantation workers in the Darjeeling Hill remained unchanged. Under these prevailing circumstances the Indian government enacted the Plantation Labour Act of 1951. This Act was passed to provide specific provisions for regulating the working and living conditions of the labourers, and to protect them against inhuman exploitation by employers (Sharma, 1999). Unfortunately, due to the opposition by the powerful tea lobby, this Act could only be enforced in 1954!

The independence of India in 1947 also heralded the arrival of trade unionism in the tea plantation areas. It is significant to note that, although the trade unions existed in the country as far back as 1926, only on the eve of India's independence, the Act (granting it right to organize trade unions) was passed (Sarkar & Lama, 1986). Despite the passing of this Act, due to the power that tea planters exercised during British administration, unionism had no real effect on tea plantations. Only with the election of a communist candidate to the Bengal Legislative Assembly in 1946, the CPI (Communist Party of India) managed to organize its first Tea Garden Labour Union in the Darjeeling District. Thereafter, it was alleged that, CPI led Trade Union deliberately encouraged indiscipline, and fostered a 'go slow movement' leading to a declaration of first lock-out in Mundakotee Tea Estate and Margaret Hope of hill tea estates by the authorities in April 1947 until Jan 26, 1948 (Sarkar & Lama, 1986). Thus, empowered by the Plantation Labour Act (1951) and other labour legislation, the tea plantation workers in the Darjeeling Hills also started doing collective bargaining through trade unions. Two trade unions were particularly active: 'the Darjeeling Tea Garden Worker's Union' and 'Darjeeling District *Chia Kaman Shramik Sangha*'. But their confrontational attitude resulted in reaction from owners of the tea plantations in the Darjeeling District by reducing the number of permanent workers after mid-1960s, so that, 50% of the plantations workers became temporary or casual labourers, with no benefits (Sharma, 1999). After independence, there were union-led strikes for workers causes, leading to more tension between management and workers in the state of West Bengal under which Darjeeling District falls (Sharma, 1999).

The ultimate losers in this power game were the plantation workers, as the conflict led to the closure of many tea plantations and others being declared “sick gardens”. This situation had far reaching consequences. Plantation workers deprived of their wages during the closure period had few other livelihood options. This had its impact on the natural resources surrounding the human settlements. One was the destruction of plantation forest or that in the vicinity of their settlement. Every tea plantation had some area allocated for forest cover for different purposes: fuel wood, housing, and also watershed protection for creating ‘ecological balance’. Under these trying circumstances, plantation communities felled trees and sold the timber or made charcoal for sale. They also used the forest for collection of non-timber forest products, such as fruits and fodder. Thus, during the temporary or complete closure of plantations, forests were used for sustaining livelihoods, thereby, depleting the natural resources of the region.

Perhaps more significantly, the environmental degradation caused by cultivation of tea in the pre-independence era began to have effects in the post-independence period. According to the early writers, what was once a land with extensive vegetation and dense forests were deforested with the clearance of forests as the rapid expansion of tea plantations in the region began (O'Malley, 1907; Patit, 1964). Around the same time, the construction of the Hill Cart Road (stretching from Siliguri up to the Lebong Cantonment) and network of small link roads in and around the plantations by earth cutting and blasting of rocks caused the weakening of slopes, soil erosion and landsliding and in general environmental deterioration of the place in the subsequent years (Lama& Sarkar, 1986; Ghosh, 1987; Chada, 1990).

In the post-independence era, deterioration of environment and tea industry was manifested in various forms: a) over-age of tea plants b) productivity stagnation, and c) land degradation.

a) Over age of tea plants: After independence as the Indian administration took charge, the tea industry in the Darjeeling Hills was approaching one hundred years in age. This meant that, unless the previous tea plantation management had initiated some re-plantation measures, tea bushes had already gone past their prime productive age, of 40 to 60 years. Consequently, the older tea bushes were not yielding the best crops even during 'peak seasons'.

b) Productivity stagnation: The over aging of the tea plants had direct consequences for the productivity of tea leaves. As the plants aged, tea production went steadily down. While the production of tea could be maintained and even increased by expanding the area of tea cultivation land (Table 1), the declining productivity of the land itself could not be arrested by the same measures. There was a great need to uproot and replace the aging tea bushes with new nursery plants. But that amounted to cutting down on the annual profit. Most of the Indian entrepreneurs, who had entered the business with the sole aim of maximizing profits, weren't ready to invest in the re-plantation of old tea bushes. This is in stark contrast to land productivity seen in other sub-Himalayan regions of North Bengal, namely, *Terai* and *Dooars*, where land productivity has not reduced, mainly due to the practice of periodic re-plantation initiatives (Bhattachaya, 1977).

d) Land degradation: Perhaps the most serious ecological impact on the plantation lands was the degradation of land. For any soil to yield maximum or even optimum crops, it needs to be well nourished. Every year some soil in most of the plantations in the hills is eroded during the heavy

monsoon rains. The use of fertilizer added to enhance productivity, helps in increasing the short-term fertility of the soil, but the main crust of the soil never recovers from the loss of nutrients. This results in adverse impact on the cultivable soil and ultimately leads to degradation of the land. In the post independence era, with production and productivity diminishing, the Indian Planters had already resorted to intense use of chemical fertilizer for increasing the production instead of replanting new plants (Sharma, 1999). They had taken the fast and easy way to make money instead of opting for the more expensive, but long-term benefit. This had adverse effect on the soil, eventually leading to the degradation of both the land and the ecology. e) Landsliding problems:

4.1.1 Mineral Spring and Singell Tea Plantations: A History

The history of the two selected cases, Mineral Spring and Singell Tea Plantations constitute part of the history of tea industry in the Darjeeling Hill.

Mineral Spring: A British Planter, Mr. Harrison by name, had established Mineral Spring in 1864 as the Harrison Tea Company. Three divisions—Dabaipani (which is one of the cases used in the study), Harsing, and Yangkhoo—constituted the Harrison Tea Estate. In subsequent years, however, it came to be registered as Lebong and Mineral Spring Co. Ltd., under the Indian Companies Act, 1913 with Registration Number 1973 (Aryan Planters' Agency, 1955; ICIMOD, 2003). The change of name of the plantation from Harrison to Mineral Spring has a special significance. The eastern most portion of the tea estate is known as *Dabaipani* in Nepali, which means 'Medicine Water'. Legend has it that an English tea plantation manager of the place, who suffered from festering sores, washed himself in one of the natural springs and was cured. Thereupon, the named of the place, and subsequently the name of the plantation, was changed to

Mineral Spring. This tea estate covered a total area of 675.33 hectares; about 215.33 ha were licensed tea cultivated area, 139.22 ha were allocated as *Khet* Land (space for human settlement plus some subsistence farming), while the remaining 460 ha of land was covered by forests or streams (Aryan Planters' Agency, 1955). Under Mr. Harrison, the first owner of the plantation, the daily wage rate for workers was: male 25 paise and female 14 paise. (25 paise is 1/4th of an *Indian Rupee*) (ICIMOD, 2003). In later years the wages were increased only marginally. But, in spite of some increase in the wage rates under later owners, such as Samson (1936), McClain (1939), and others, the quality of life of the tea plantation workers remained grim and unchanged (ICIMOD, 2003).

India's independence in 1947 brought many changes in organization, with ownership of many industries being passed on to the Indians. The ownership of Mineral Spring Tea Company changed hands— R.N. Chakarvarty & Brothers having taken over the ownership of the tea estate from Messrs James Finlay & Co, Ltd., after buying it for Rs. 6,65,000 in 1946 (Aryan Planters Agency Booklet, 1955). But India's independence as well as ownership and management by Indian administration did not change the socio-economic conditions of the workers (Sharma, 1999). After independence, specific industries, like tea, were left in shambles after being passed on to inexperience and untrained plantation managers (Syamroy, 1985). As a result, along with many plantations in the northeastern parts of India, the fortunes of Mineral Spring Tea Estate also had started fluctuating. Following financial mismanagement and interference from the government, and most importantly due to the irregularities of payments and bonus, the plantation was declared a "sick tea garden" in 1953 (Rai & Sarkar, 1986). Some of the reasons for assigning this category to a tea plantation are bad industrial relations resulting in frequent

disputes, low level of wages, even non-payment of wages (wage irregularities), the arrears of the payments of gratuity and Provident fund (PF), and non-fulfillment of statutory obligation relating to health welfare, housing and so on.

In the years that followed, the Darjeeling Labour Commissioner tried to broker new negotiations between the existing management, led by Mr. Chatterjee, and the *Darjeeling Chia Kamaan Majdoor Union*, even as the workers carried on their work without receiving regular wages. According to a senior witness of the crisis, Mr. Dilaram, “During this period, as the plantation faced problem of closure, workers agreed to work by receiving wages once in three monthsit was a question of our survival”. Unfortunately, all negotiation attempts failed. The management also seemed to have tried negotiating with the government for financial assistance, but even that failed to yield any result. Consequently, the management couldn’t pay wages and other benefits to the workers or other plantation staff. This resulted in a situation of unrest and occasional violence. And, as the agitation by the unpaid and underpaid workers started turning violent, the management decided to abandon the plantation. Thus, in 1957, Mineral Spring tea plantation was declared closed even while its infrastructure remained intact.

Different hypotheses have been put forth as to the reason for the eventual fate of this plantation. Some suggest that the state of bankruptcy due to mismanagement compelled the management to desert the plantation. Others blame it on the failure to reach any consensus between plantation management and the trade unions. Still others think the worker- unrest was the cause that led to the eventual closure of the plantation (Rai & Sarkar, 1986). These questions notwithstanding, the infrastructure of the plantation was still sound in 1957. This encouraged some small-time

business groups to attempt operating it at different points in time even as the plantation remained in the “sick tea garden” category. Most of these small industries operated only during peak seasons when the tea leaves were in large quantity. They were only interested in the profit they could make in a short period by employing a small number of casual workers. As a result, the majority of the erstwhile permanent workers either had to look for work elsewhere or wait for their turn to be called in for work. Rohit (73 yrs), another surviving member from 1960s crisis noted:

“Once the tea estate was abandoned by the managers, we waited for some companies to come and restart the work. But whoever came, were mostly interested in their own profit, not our work. So in frustration we worked in adjacent tea estates but even there, the other workers objected to our presence; so we had to search for work elsewhere”.

Not everybody was ready to venture outside of the region for work; many were selling “hand-made tea” in the nearby markets or neighbouring tea estates to maintain their livelihoods. The growing misery due to irregular pay made the workers community increasingly frustrated. Finally, in 1968, this frustration gave way to anger, resulting in vandalism and destruction of the tea-processing unit; thereby, incapacitating any further attempts for a revival of the plantation. According to government regulations there are certain conditions for the revival of permanently closed plantation: i) the availability of labour in the garden; ii) the plantation still exists and is capable of being made viable at a reasonable investment; iii) the factory is in reasonably good shape (Ghosh, 1987). But with the destruction of the tea factory, Mineral Spring could not be legally reinstated to its former status as a plantation.

This period from late 1960s to mid-1980s is very significant as far as the failure in managing the natural resources of the place was concerned. For almost a decade, people had survived by working as part-time tea workers, selling green leaves to the neighbouring estates, working as road construction labourers, and even by selling firewood and charcoal from forests present within tea gardens area (Rai & Sarkar, 1986; RCDC, 1996). In the early days of the closure of Lebong and Mineral Spring Tea Estate, people were exposed to hardships of every kind that reduced them to sub-human stature—low wages, inadequate housing, scarcity of drinking water, and virtual absence of medical/ sanitary arrangements. Due to these factors, people started engaging in the uprooting of tea bushes and the cultivation of maize and millet even if it brought forth very low yield. Lack of knowledge of cultivation, having engaged in tea plucking work for generations, and the high acidity of the soil were the main causes of low production of grain crops. By the mid 1960s, the reserved forests in and around the territory of this plantation had depleted considerably, which in the later years, led to soil erosion, water shortage, and landslides, as well as the destruction of the wildlife habitats (RCDC, 1996). But, with the last hope of revival of the plantation gone, a form of anarchy prevailed; people started grabbing the land by using their muscle power and influence. This gave birth to new settlements where there was inequality in the distribution of land property (<http://www.curriculumsupport.nsw.edu.au>). So, when the people started uprooting tea bushes in order to begin subsistence cultivation, they faced big challenge, as they needed to make terraced- fields for their new agriculture to be viable in this hill area. Moreover, due to acidity of the soil previously occupied by tea bushes, it took many years before the soil became suitable for agriculture. In the meantime, these erstwhile tea garden workers supplemented their subsistence income by selling milk. In the early years of the

transition period, milk sold to the middlemen was a mere 44 *paise* / litre and the average income of a household in Harsing and Dabaipani *busties* was barely Rs. 600 a year (NSS- Survey Report, 1971). The government response was conspicuous by its apathy towards the whole situation and its failure to take any concrete steps to sustain people's livelihoods. The main reason was that even in late 1950's and 60's, Mineral Spring was legally designated as tea estate under the Plantation Labour Act (1951) and hence, outside the purview of government or other welfare schemes (Rai & Sarkar, 1986). Under these circumstances, 1973 proved to be a landmark year as the Hayden Hall Institute, Darjeeling, made the first NGO intervention in this area. At its arrival, the Institute established *Harsing Busty Dairy Union*, which started operating from 1 April 1973 with sale of 12 litres of milk on the first day. This became about 150 litres/day at the end of the year and about 600 litres/day in 1979 (Rai & Sarkar, 1986). Apart from initiating the dairy union, this NGO was also involved in women-child care, food for work schemes, and medical outreach programmes. But, in 1987, Hayden Hall withdrew its personnel from the field. There are different versions of the explanation for the withdrawal of Hayden Hall Institute. According to some people, some community members from Mineral Spring entrusted with running the sale of milk were involved in mismanagement of money. But the personnel from Hayden Hall Institute involved in the mission claim that, after more than a decade's presence they decided to withdraw and move to other places that needed them. This left the community without any recognized and accepted leader to fend for themselves. In 1986-88, the entire Darjeeling Hills got embroiled in the 'Gorkha land Movement' for a separate state for the people of Nepalese or Gorkha background. In spite of their own struggles, the people of this place took an active part in the movement until a relatively autonomous body within the West Bengal State, called the Darjeeling Gorkha Hill Council (DGHC), was set up in 1993. After its formation, one of the

most significant works of DGHC was the construction of roads in remote areas. Mineral Spring benefited from this developmental programme through the construction of a vehicular road connecting it to the Darjeeling Town.

1996 proved to be another significant year for this place due to the entry of a local NGO -Rural Community Development Centre (RCDC). With the intervention of RCDC (presently called *PRERNA*), the people of former Mineral Spring plantation formed *Sanjukta Vikas Cooperative* (SVC) with milk as its first product (RCDC, 1996). Later, besides milk, SVC started managing green tea leaves, consumer co-operatives and saving credit union under the aegis of RCDC. After more than three decades of transitional period, Mineral Spring was transformed from a “sick tea garden” to ‘small tea farmers’ plantation.

Singell Tea Plantation: In 1870, a British Planter, James White, established Singell Tea Estate, located in the Kurseong sub-division of the Darjeeling District. The first British company to undertake the management of this plantation was Hor & Miller Co., which continued to own the plantation even after India’s independence (until 1960, with Mr. H.S. Young as the last manager). Finally, in 1960, Hor and Miller Co., sold the Singell Tea Estate to its first Indian owner, Rampuria Co. Then, as was early Indian business community’s style of functioning, the trend of buying and selling the plantation according to the profitability or loss of tea business began. Within a decade, Singell Tea Estate was sold to the Karnani Group in 1967, which slightly modified the name to *Singell Tea & Agricultural Industrial Ltd.* But, as if to confirm the myth that the first Indian planters were not capable of managing a tea plantation, the new company ran into difficulties. Within a decade of taking over the ownership and management,

the plantation was declared a “sick tea garden” by the government. This was done on the pretext of unrest among the workers, due to payment irregularities and bonus problems owing to the company’s financial difficulties. The Karnani Group countered by filing litigation on the charge of unnecessary interference by the government. As the management got entangled in the legal battle with the government to get its proper status installed, the financial problem was further aggravated. As a result, in early 1969, the plantation was declared ‘closed’ and managers were pulled out by the Karnani Group.

Nothing is written or recorded as to what happened during the closure period. However, when I used the Story Narration technique to get the history of the place, I heard many senior residents of the plantation had to undergo socio-economic crisis. As Rufina, now a retired tea worker woman put: “When our tea estate closed down indefinitely, we faced terrible suffering. We had nothing to eat or had any other livelihood alternatives, as we completely depended on our wages and ration”. According to other surviving members of the tea estate who were interviewed, plantation labourers had neither wage nor other income sources to sustain their livelihood; that forced them to seek employment in near and far places. According to another retired tea worker Dindayal (69 Yrs), “after the plantation was closed indefinitely without pay, many people went outside in search of some work. Some people went to *Khare Busti*, a few miles from here to work as road construction workers”.

Fig. 3: Singell Tea Estate



In the meantime, the Darjeeling Planters Association (DPA) entered the scene for negotiation between management and trade unions. The DPA works for the welfare of the plantation, in particular, for enhancing and protecting the business of tea planters. The vigorous negotiations finally led to the reopening of the plantation after 6 months of lockout in December 1969. The next five years were quite uneventful years; there was a better coordination and relationship between the management and the trade union. However, the tea plants of the Singell Tea Estate had already crossed the hundred-year mark without being replanted, and the present proprietors were in no mood or position to spend on the re-plantation measures. Today, the Tea Board of India subsidizes re-plantation, but this was not the case fifty years ago (Lama & Sarkar, 1986). Not surprisingly, the Karnani Group went for personal profit at the expense of irregularities of payments and a cut in the yearly bonus paid to workers, forcing the agitated workers to ransack the tea plantation offices in 1974. While this did not result in any action by the government, the incumbent proprietor passed on the ownership and management of Singell to another business group called Tea Sales and Allied Industries Co., only to retrieve the plantation ownership and management in 1979. This was, as if to vindicate that, frequent changes in ownership and management are generally indicative of the unstable economic condition of any tea plantation (Ghosh, 1987).

The management period of Karnani Group is considered the lowest ebb in the history of Singell Tea Estate. While the plantation was never stable in economic terms, it did precious little to contain the depletion of natural resources of the place. Most of the interviewees in this plantation tend to blame Karnani Group for the depletion of forests in and around the plantation. It is said

that the British Planters and managers used to buy timbers from outside for building or repairing houses and fire wood for the workers in order to preserve forests in the tea estate and in its vicinity (Roy, 1965). In addition, during British management, there was a strict prohibition on felling of large trees in the plantation land and areas within the jurisdiction of the management. Consequently, on the northern slope and along the streams there were dense forest covers. The prime motive of Indian Companies was making maximum profit in the shortest time possible. To achieve its objective, Karnani Group decided to change the trend set by the British. Instead of spending large sum for purchasing timber and firewood from outside, they went for the felling of large trees in and around the plantation. With profit as their sole motive, no measures were taken to even re-plant tea bushes, let alone forest trees.

After coming to power in 1977, the Marxist government of West Bengal had increased its control over the tea industry. According to the a key informant, on 21 March 1986, charging that the present proprietor had failed to pay the land rent since 1958 (even though the garden was bought only in 1967), the government handed over the management of Singell T.E. to West Bengal Tea Development Corporation Ltd., (WBTDC). The WBTDC Ltd., a govt. undertaking, operated the plantation until 1993. Under the management of the WBTDC, one significant initiative was undertaken—a shift from the use of chemical fertilizer to organic manure (cow dung and green compost). Thus, 1989 was the first venture towards producing Bio Organic Tea. However, this period also was marred by frequent *bandhs* (strikes) on tea plantations and other businesses as the Gorkha land Movement (1986-88) gained momentum and occasional notoriety. During this period, some people freely felled trees from the nearby forests and sold the timber, even as the management or local forest authorities closed their eyes to the destruction of this natural

resource. Thus, at that period, the forest became 'common property' to be used by anyone in need, without any thought for its conservation for future generations. Meanwhile, the Karnani Group that had filed litigation in the Supreme Court of India against the unlawful way of government taking over of Singell Tea Estate continued its legal battle, until 1993, when the verdict went in favour of them. Following the Supreme Court verdict, WBTDC left Singell and allowed the Karnani Group to once again assume the management of the plantation until December 9, 1999 when the incumbent company decided to sell off the plantation. In the interim period between 1994-98, once again this plantation suffered due to poor financial condition of the company. Besides poor management and loss in production, the financial burden of a legal battle had a bearing on the Karnani Group before it called quits to the Singell Tea Estate. Thus, December 1999 signalled the end of an era of payment irregularities and financial problems: an era when the plantation never operated smoothly but rather limped, an era when natural resources such as forests, streams, and other arable land (including existing tea plants) had become 'common properties' to be used without any thought for the future. On the positive side, the end of the millennium also heralded the arrival of an environmentally friendly and socio-economically more conscious management group—TPI Pvt. Ltd., (Tea Promoters of India). On 10 December 1999, TPI Pvt. Ltd., owned by Mohan Groups, took charge of the management of Singell Tea Estate along with 6 other gardens, including Salimbong Tea Estate where the green leaves of SVC from Mineral Spring are processed and marketed. Having undertaken operation of the tea estate, the new management introduced an effort to transform the plantation from orthodox black tea to the manufacturing of bioorganic tea. The intensive campaign of this new venture, in collaboration with German agents, is paying dividends. In 2000 Singell was certified and declared a Bio-Organic Tea manufacturing tea estate.

4.1.2 Mineral Spring and Singell Tea Plantations: Similarities & Differences

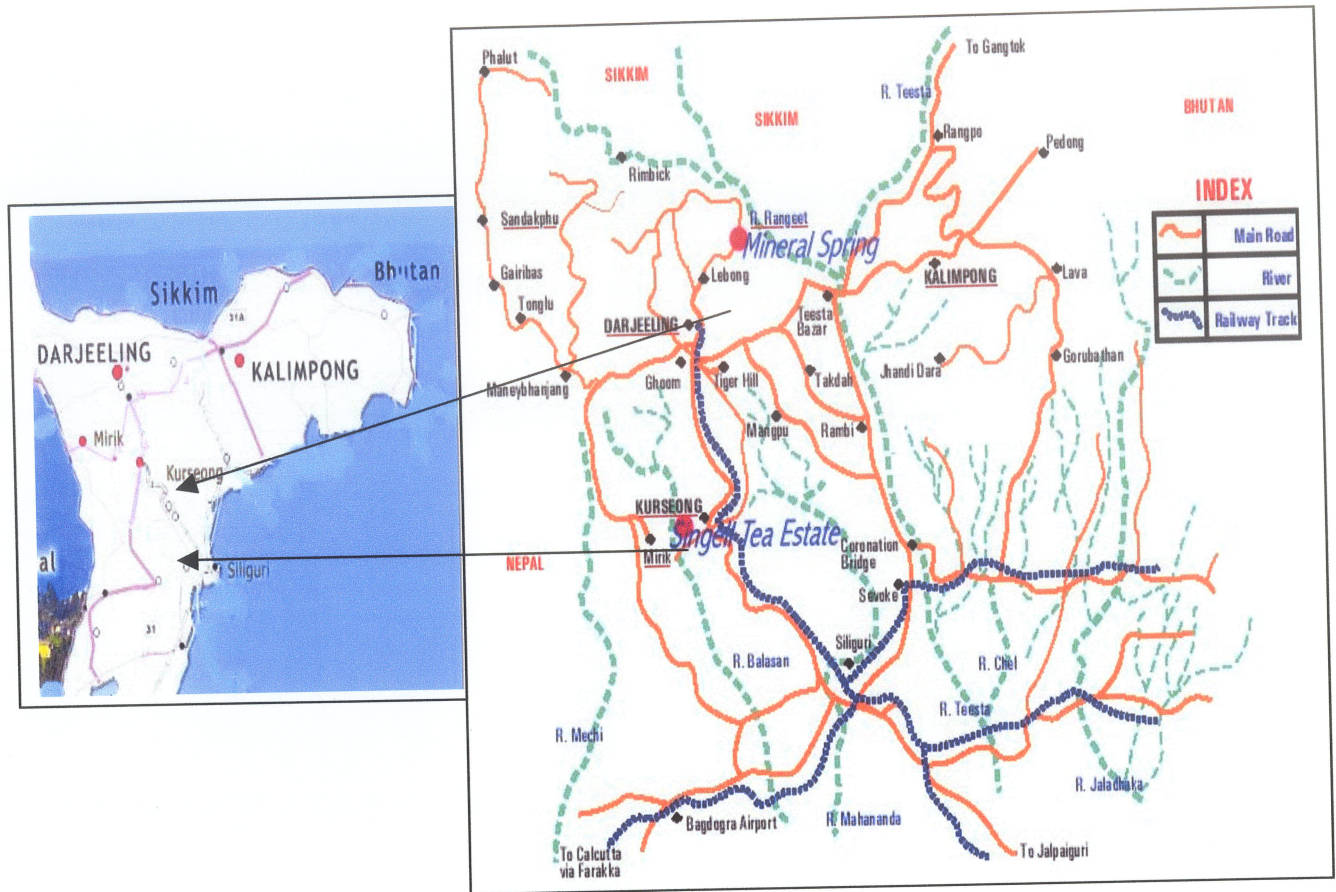


Fig. 4: Two Case Study areas—Mineral Spring and Singell Tea Estate shown in the district map

Situated about 55 km apart in the Darjeeling Hills (Fig. 4), these two plantations have both similarities and differences. In this section, I will describe commonalities and contrast their growth, and occasional crises that led to the eventual decline of Mineral Spring, and a slow decline followed by revival of the Singell Tea Estate. At the end, I will discuss the transition that the former plantation has taken while explaining some new initiatives that are being under taken in the latter plantation.

4.1.2a Evolution, Growth and Decline

The British planters established both the plantations during 1865-1870, when the tea industry in the Darjeeling Hills was going through steady expansion after its initial success. For more than half-a century, these plantations were nurtured and developed by British planters with the help of various well-trained managers and hard working emigrant workers from Nepal. Both tea estates were also blessed with optimal terrain for tea cultivation. Both were located at a relatively lower altitude most suited for tea cultivation. These valleys acted as drainage for rivers like Balason in Singell and different *Kholas* (mountain streams) in Mineral Spring; their tributaries carrying perennial water so essential for the irrigation of tea plants. While both these plantations occupied a large area and expanded their tea cultivable land, a considerable area of forest covering was preserved in their surrounding areas—460 ha in Mineral Spring and 268 ha in Singell. Keeping maximum production and profit in mind, the wasteland and other adjacent areas were also converted into cultivable land for tea. But it is also interesting to note that, in both cases a serious crisis began after the change of ownership in the post-independence era.

If the early establishment and growth in the two plantations show a somewhat similar trend, their decline and revival traits are dissimilar. Mineral Spring was one of the first tea plantations in the region to be closed down. In 1953, the state government of West Bengal declared the plantation a “sick tea garden” on the charges of irregularities of payments by the management and unrest among the plantation workers. There were some negotiations between the owners (Chakarvarty & Brothers) and trade unions but on its failure to resolve the crises, the owners pulled their managers out and declared the plantation “closed” in 1957. Singell Tea Estate was also placed on

the list of the “sick tea garden” and later closed in 1969 but this proved a temporary phase. Thus, the economy of a smooth and steadily running tea estate under British administration continued to suffer even after recovering, and was never to be the same again until 1999.

4.1.2b Revival

Some studies conducted in the past stated that, with the abandonment of the incumbent management in 1957, the plantation history of Mineral Spring was over. To the contrary, I would argue that Mineral Spring continued to be a tea plantation, albeit, without a stable management, while at the same time bearing the tag of “sick tea garden”. There were still some negotiation attempts by concerned parties, brokered by the Labour Commissioner of Darjeeling that was aimed at revival of the plantation. Even after the existing management left, some small groups attempted revival, due to the continuous existence of its infrastructure. However, in December 1968, an irate mob of jobless plantation workers vandalized, and eventually, destroyed, the existing tea factory thereby, erasing the last sign of full-fledged plantation and rendering futile any further revival attempts. It is interesting, however, to note that, as late as 1980 —with the no sign to the end of misery of people—some representatives from Mineral Spring had sent a letter to the managing director of WBTDC, (with copies of the letter to the state chief minister and district magistrate), with a request to restore the plantation and save the suffering plantation workers (Lebong & Mineral Spring Letter, 1980). In contrast, the closure of Singell Tea Estate proved to be only temporary, due to a timely intervention by the Darjeeling Planters Association (DPA). In this case, less confrontational negotiations between the involved parties paid off, leading to the reopening of the plantation barely 7 months after it was declared closed. Ironically, the quick revival proved to be temporary. In the next few decades it was to witness frequent short

lock-outs-- signs of decline in the plantation that had already set in and that were vindicated by rather frequent troubles in the garden culminating in its handing over to the WBTD—government undertaking. Thus, though Singell Tea Estate was revived quickly, its fortune was on the wane, until the arrival of Tea Promoters (India), Pvt. Ltd.

Summary Table3: Comparing Beginning and Growth of Mineral Spring and Singell Plantations

Name of the plantation	Year of establishment	First owner company	Total acreage Area	Area under Tea Cultivation	Area under forest cover/housing/ streams
Mineral Spring	1864	Harrison Tea Company	675.33 ha	215.33 ha.	460 ha.
Singell T.E	1870	Hor and Miller Company	550.54 ha.	282.58 ha.	267.96 ha.

Summary Table 4: Contrasting Mineral Spring and Singell Tea Estates

Name of plantation	<i>Ownership after India's Independence</i>	<i>Change of ownership Year</i>	<i>"Sick Tea Garden" status</i>	<i>Year of plantation closure</i>	<i>Full plantation closure</i>	<i>Revival of plantation</i>	<i>Present Mgmt Regime</i>
Mineral Spring	R.N. Chakarvarty & Brothers	1946	1953	1957	1968	All revival attempts failed	Sunjukta Vikas Co-operative (SVC)
Singell T. E.	Rampur Co.	1960	1968	1969	No full closure	Dec. 1969	TPI (Tea Promoters of India)

4.2 Geo-ecological Conditions of the Sites under study

4.2.1 Vegetation and forestry

In the Darjeeling Himalaya region, dominated by tea plantations, only some part of the district such as, Kalimpong, Sukhna and Teesta Valley have somewhat dense forest cover. In rest of the district, relatively dense tree covers have been designated as 'reserved' or 'protected forest' areas by the forest administration. In the Darjeeling District, six primary types of forest can be found at different altitudes: i) The Terai and lower hill forest (up to 300m); ii) tropical forest (300-900m); iii) sub-tropical forest (900-1800m); iv) lower temperate forest (1800-2400m); v) upper temperate forest (2400-3000m); vi) sub-alpine forest (3000-4000m) (Fareedi et al, 2000). After India's independence, under the Estate Acquisition Act (1953), *Khasmahal* forest and surplus forests on tea-leased lands were transferred to the government-designated 'protected forests' (Roy, 1965). At present, various administrative authorities, either collaboratively or directly administers the forest areas in the region.

In Singell Tea Estate, the lack of any record was a big hurdle in comparing the existing forest cover in and around the plantation with the forest cover about 30 years ago. But almost all the elderly plantation residents interviewed agreed, that, due to regular tree felling by plantation people and even by some management, relatively dense forest of the past had become quite sparse. In the words of Naren (77 yrs), a retired night guard of the plantation, "when the tea estate was owned by the British Planters, there was a strict prohibition on tree felling, so that, fairly dense forest was present all around this plantation. But in the last 30 years or so, different managements cut trees for different purposes and people from tea estate and from outside felled

large trees and sold the timbers. That led to this situation, where there is hardly any forest tree left or only traces of forest is seen”.

At the present time, only a small forest area of the past years in the tea-leased lands has remained after they were designated ‘reserved or protected forests’ under the strict supervision of the Forest Directorate and the Land Reform Department. Plantation management has also been empowered to impose penalties on the violators of forest regulations. There is almost a complete lack of other vegetation if we remove tea plants from the Singell Plantation land. However, the current management of Singell Tea Estate has provided the plantation workers with LPG cooking gas as an alternative for firewood. Thus, sanctions against tree felling and LPG as the alternative for firewood for cooking, are controlling the problem of deforestation.

The people of Singell, due to lack of land, are unable to initiate reforestation measures at households level. But there has been some measures taken by the current management as institutional response. On the way to the tea factory, one can observe some measures at reforestation along the tea estate roads; it is initiated through the introduction of monoculture forestry. Walking along the road one cannot fail to notice tall exotic trees belonging to the Dhupi (*Cryptomeria Japonica*) species (Fig.5).

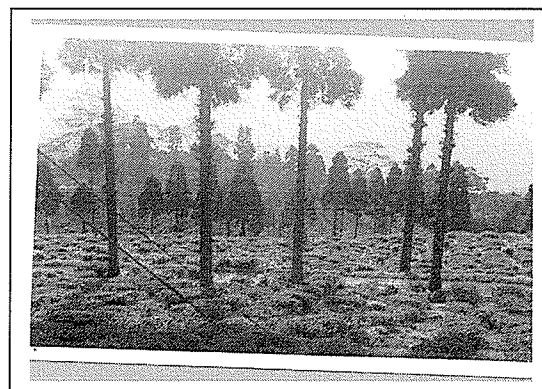


Fig.5: Presence of *Cryptomeria Japonica* in Singell T.E.

But according to some experts, planting of this tree is a serious mistake because this species of tree is known to disturb the ecology of naturally forested areas, promotes soil erosion, and does not conserve water (Mukherjee, 2000; Fareedi et al, 2000). Also, Dhupi (*C. Japonica*) is known to take about fifteen years before it becomes effective in holding the soil layers; before this time, soil layers are partly carried away (Basu, 1979). Also it has been observed that no other vegetation survives under the shade of these *Dhupi* trees.

The forests, adjacent to Mineral Spring come under the protected forest area of Sinchell Wildlife Sanctuary, where temperate forest comprises the main vegetation type. These protected forest covers are under the joint supervision/administration of the Wildlife Division and the Darjeeling Gorkha Hill Council. So the people of Mineral Spring have no access to forest products— trees or fodder. More than a decade ago, this situation led the community to plant trees in their own fields. And, today, one cannot fail to notice dense vegetation in different hamlets of Mineral Spring. From the study I found that from 1990s, Mineral Spring has been witnessing a kind of reversal as far as forest resource is concerned. So, it was not surprising when the majority of people interviewed responded that tree-cover had increased in and around their place in recent years. Consequently, Mineral Spring has become rich in vegetation—not due to the presence of dense forests but due to planting of trees by the households in their fields. At first sight it appears as if the whole community has taken some environmental measures to reforest their place. But when the question was asked, “Is there any environmental promotion initiated by the community”? The answer was “No”. The real answer came from a key informant: “There were some factors that led to a kind of reforestation measures being taken by the people though not at community level but at household level. First of all, the forest was very far from here and

secondly, those areas had been declared 'protected forests' where the public was prohibited to enter. So some households decided to plant many fast growing trees so as not to depend on forests; later other households followed suit, and finally all the households were fulfilling the demand for firewood and fodder from their own land." The majority of people interviewed reported that, due to the restriction or ban imposed by the Forest Division on cutting of trees from the reserved or protected forests the community was compelled to plant trees at the household level more than a decade ago. As a result of this, the hamlets in Mineral Spring appear like dense forest area with diverse vegetation types. People have planted *Oatis*, *Malata*, *Narket reed*, *Cyris*, *bamboos*, and other fast growing trees in their fields.

4.2.2 Land resources

The land is an invaluable resource in this region. In both study areas, one could see some rugged and rocky land, unsuitable for habitation or vegetation. Similarly, in both places some lands are fragile due to steep slope or unstable nature of the ground; still other places are filled with marshy vegetation called 'wasteland'. Some of these lands cannot be utilized for any cultivation, human settlement or for any development activities due to their steepness or fragility. Due to aforementioned reasons, arable land is relatively scarce compared to the land in the plains, and thus, highly populated. That is the reason human population tends to cluster in urban areas instead of being scattered throughout the hills. But the usable land tends to be very fertile, (as is witnessed in Mineral Spring) and hence, rich in bio-diversity. A variety of vegetation--trees, plants, shrubs and grass species sprout from the land and make the place biologically diverse. The land in both the study areas, Mineral Spring and Singell were very fertile and full of vegetation, even though land is used differently and at different proportion.

2.2.2a. Land use pattern in the area:

The Darjeeling District is known for its diverse vegetation types. It is a well-known fact, that land in the Darjeeling Hills is mainly occupied by forest (reserved and protected forests), tea plantations, and human settlements. In the entire Darjeeling District, about 38% of the area has been occupied by forest cover, 18% of the area by tea plantations, 2% of the area by cinchona plantation, and the rest of the land (42%) has been used as *Khasmahal* for human settlement, waste land and stream/rivers etc. (Lama & Sarkar, 1986; Fareedi et al, 2003). But in recent years, the land use is witnessing some kind of reversal due to many factors, the most important being the increase in human population and many developmental activities in and around the areas. These factors, in turn, are impacting the stability of the land, resulting in landslides and erosion. In the two areas where the study was conducted, most prominent use of the land was for the cultivation of tea plants, different cash crops and subsistence farming.

In Singell Tea Estate, about three-fourths of the land has been used for the tea cultivation, far more than the estimated 282 hectares (53%) of land that was allotted for it, so as to leave the rest of the land for forest cover and *Khasmahal* use. At the present time, the land occupied by remaining forest cover in the tea-leased land is almost negligible and mostly confined to the fringes. The land touching the streams, once occupied by tall trees, grows only wild shrubs or vegetation. The third type of land use, *Khasmahal*, has always covered the smallest area. They are congested areas allocated for human settlements around the tea-processing unit. The lands given for 'labour colonies' (for plantation workers housing) are so small that they resemble slums in the big Indian cities. And due to these cramped spaces, there are hardly any land left for subsistence farming or rearing of livestock, though each household is given a very small kitchen

garden. However, after the arrival of the present management, the land use pattern is undergoing drastic changes in Singell Tea Estate. The land, which was left unoccupied as 'wasteland' in the past, is being converted into fields for more cultivation of tea. The current management has also started a campaign on re-plantation of tea bushes and so vacant wasteland is slowly being converted into expansive tea plantation land. This aside, gradual encroachment of peripheral tea estate property adjacent to Lebong –Hill Cart road or along forestland by human settlements has also influenced the change of land use pattern in and around Singell.

In the Mineral Spring area, the land use pattern has undergone dramatic changes. Four decades ago, this area had tea as the most extensive land use, followed by forest cover. After the closure of the plantation, people in need of money and food, deforested the area and uprooted numerous tea plants and replaced them with subsistence crops. The alarming rate of deforestation in the late 1960's to 1980's, caused the Forest Department to declare the remaining forest cover as 'protected area', thereby, prohibiting any further cutting of forest trees. Yet, since no concrete measures were taken for reforestation except to protect the remaining trees, the amount of land used for forest remained almost stagnant. In Mineral Spring, much of the land once occupied by tea plants is being used for human settlements. Also, a large portion of the land is being used for the cultivation of lucrative cash crops such as, ginger, cardamom, orange or broomsticks, besides regular vegetables for home consumption. While the land is used seasonally for ginger and some other crops, broomsticks and cardamom tend to occupy the land for a much longer period once they are planted (Fig. 6). But the factor that has caused perhaps the biggest change in land use patterns in Mineral Spring area is the planting of fast growing trees such as *Oatis*, *Malati*, *Nerket*, *lampate*, (all Nepali names) and bamboo. This has not only brought an increase in tree

cover but has also helped in stabilizing the land besides absorbing the moisture in the ground. After the ban on tree felling from the Forest Department, people were compelled to plant different fast growing trees to give them fuel wood. But as a result of this move, the land, once devoid of any kind of trees, has become filled with fast growing trees and bamboos. In addition, these days, land is extensively used for tea farming by most households after the success of organic tea cultivation.

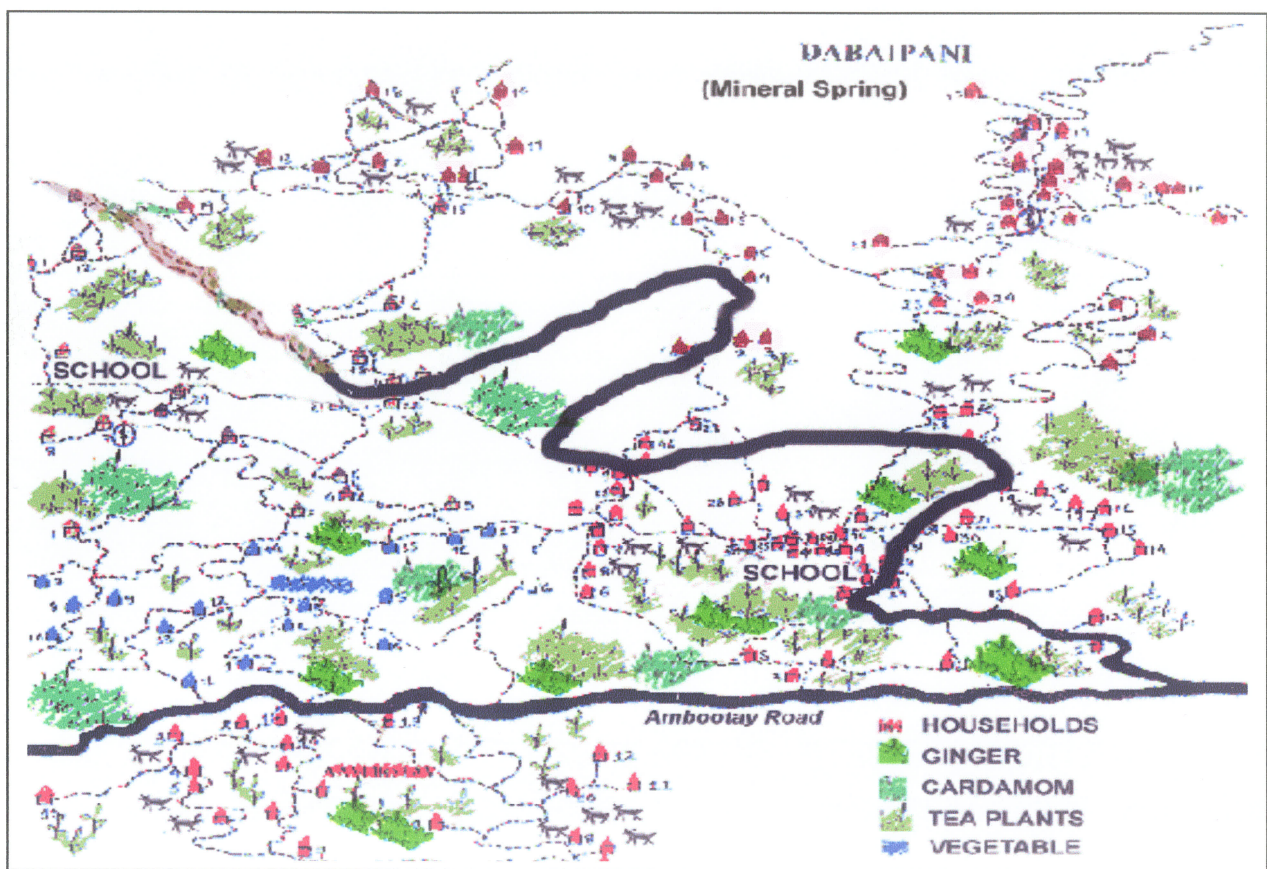


Fig. 6: Map showing the cultivation of cash crops and animal husbandry in Mineral Spring

4.2.2b. Landslides/soil-erosion Issues:

The Darjeeling District, like many other parts of the Himalaya is well known for incidents of landslides and other erosional processes. According to the records, most landslides in the

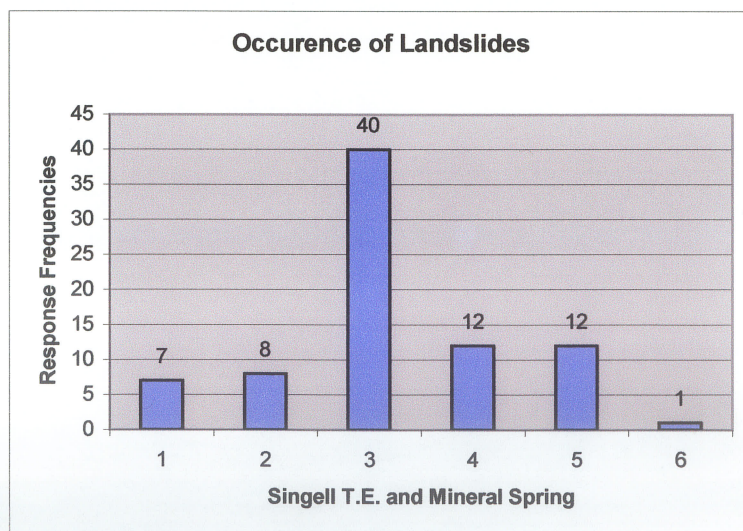
Darjeeling area occur along the roads or around the areas with ongoing developmental activities, and mainly during heavy rainy season (Basu, 1978). In spite of the long history of landslide occurrence in the region, there have been few documents recording the instances of landslides that have had major impact on the tea plantations. However, from interviewing senior plantation workers, both in Mineral Spring and Singell, I came to know that the 1968 monsoon had caused widespread landslides, both large and small. In addition, in both places landslides of 1950 and 1954 are etched in the memory of elders/senior people. A large-scale landslide in 1954 has special significance in Dabaipani division of Mineral Spring where two families of *Godamdhura* hamlets were killed. According to Rupender (67 yrs) who had witnessed the incident, "That fateful night it was raining very heavily. There was a huge rock just above the village road, which had never given any sign of shifting all those years. But perhaps, due to incessant rain for several hours, the ground below the rock became too weak to support it. And the rock rolled down the road and crushed two closely built houses below it, killing all the 14 occupants. I along with my family sleeping in the third house a few meters away survived by a whisker".

In Singell, too, landslides of 1950, 1954, 1968 and 1980 caused major damages. But, compared to the landslide in one of the adjacent plantations in Ambootiah, in 1984 (Ghosh, 1987; Sarkel & Basu, 2000), this tea estate did not experience any large-scale landslides on its property.

According to those who were interviewed, at the present time also, there are some instances of landslides occurring in these two places but landslides of great magnitude are fewer in number. In fact, taken cumulatively, 50% of the total 80 people interviewed said that the incidences of landslides have been reduced considerably occurring only "sometimes" (Fig.7). Also according to majority (59%) of people interviewed, landslides are "small" in magnitude, meaning, they do

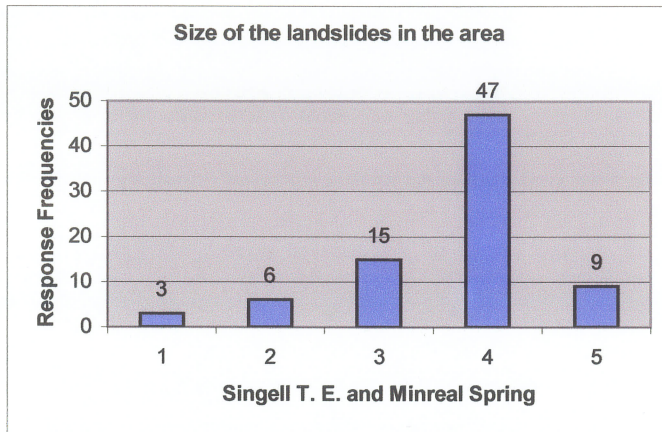
not cause any significant impact upon the place or people (Fig.8). As Nipen, an office clerk, noted: “In the two adjacent tea estates, Balason and Ambootiah, large and small landslides take places every year. But in our tea estate, one can find small landslides, mostly near steep slopes or streams and away from the human settlements.” Even my observation was that though, there were quite a few small landslides or soil-erosion, most of them was confined to slopes or streams. These could be easily corroborated through transect walks and observations; I might have counted about twenty landslides but of insignificant nature. As I took casual walk around the area, I could see dozens of small landslides near streams or along narrow paths where people and livestock tend to loosen the soil leading to its erosion. Observations and the transect walks confirmed the views of those in the majority who said that ‘landslides have become rather infrequent and smaller in magnitude’.

Fig.7: Frequency of Landslide Occurrence (Responses from 80 interviewees two cases



Sl. No.	Bin	Variables	Frq (f)
1	0	Never	7
2	1	Occasionally	8
3	2	Sometimes	41
4	3	Often	12
5	4	Every year	12

Fig. 8: Size of the occurring Landslide (Responses of 80 interviewees in two cases)



No	Bin	Variables	Frq(f)
	0	Not sure	3
	1	Negligible	6
	2	Very small	15
	3	Small	47
	4	Fairly large	9

One important finding was that during my transect walks and other casual walks I observed that whichever place any new road construction was underway, many small and some big landslides had already occurred or occurring (Fig.9 & Fig.10). Under the Darjeeling Hill Council Developmental Programmes, new roads have been constructed or are being constructed all over the Darjeeling Hills, including in Mineral Spring and in Singell Tea Estate. I clearly observed that the excavation of ground and rocks, and uprooting of vegetation in the process of road construction have caused, and continue to cause, serious landslides, mudslides, rock falls, and enormous soil erosion on both sides of the roads.

Therefore, roads construction has become the most significant cause for landslides in these two places as it involves different activities.



Fig.9: Landslides due to road construction (M. Spring). Fig10: Removal of stones for new road in Singell

A very interesting aspect of the interview was peoples' lack of reporting of landslides due to roads. Most of the people did not mention any erosions or landslides caused by road construction and, on being reminded, they considered it temporary phenomenon, which was a necessary consequence of the development of the place. Suresh, an occasional road worker himself, put it well, " We do not consider landslides or soil erosion caused by construction of roads as something serious. These are temporary events, which will stabilize once the work is finished and things are left undisturbed. Moreover, we are not worried about temporary destabilization of the ground or sliding of soil, because road is needed here for the development of this place and also improvement of our socio-economic conditions".

4.2.3 Water resources

The Darjeeling Hill region is moist year round due to the presence of many perennially flowing streams and springs besides receiving one of the heaviest rainfalls in the world. But these streams and other water bodies depend on seasonal monsoon rain for the supply of sufficient water.

Ironically, the entire Darjeeling hill region, despite so much of water resources, faces scarcity of safe drinking water almost half of the year due to lack of technology to store water. Generally,

the source of water is similar in Mineral Spring and in Singell Tea Estate. In both places, monsoon rain, mountain streams and natural springs are the main sources of water.

4.2.3a Monsoon Rain

Clouds originating from the Bay of Bengal above the Indian Ocean, cause heavy precipitation known as 'monsoon' rains. Lasting from mid-May until late September, the monsoon rainfall supplies the water in the region for about 7 months. One of the factors contributing to the success of tea plantations in this region is the heavy rain that irrigates the plants spread over many hectares of land. This heavy monsoon notwithstanding, the entire region suffers, to some degree, from a shortage of water for about five months. One of the reasons for the shortage of water is the lack of any large water storage tanks for better utilization of water during dry seasons. And also, due to the high altitude, there are no other concrete means of channeling the rainwater for irrigation or other purposes. Fortunately, Mineral Spring area suffers less from lack of water due to numerous small water channels and also the dense tree cover helps in keeping the ground/soil moist even during dry season. In Singell Tea Estate, irrigation of such a vast area creates a big challenge with the shortage of water during dry season in two large streams flowing through the plantation land.

4.2.3b Mountain Streams

Second to the monsoon rain, the mountain streams serve as the most important sources of water for the people of this region. During the rainy season, they mainly function as a drainage system as rainwater runs off through these streams (not to mention their use as household sewer with faeces and other dirt getting transported through them to the lowlands). But after the end of

monsoon season, people tend to use these same streams for drawing water for irrigating their crops. Yet, not all places are blessed with these streams. Dabaipani Division of Mineral Spring, which served as the base for my study, has two perennially running streams located at each end of the village; people connect their polythene pipes to these streams so as to transport irrigation water to their fields. But, from the end of October until the beginning of monsoon in April-May, the supply of water becomes very thin.

Singell Tea Estate also has two mountain streams—*Hushel Khola* and *Kharen Johra*. They serve as excellent sources of irrigation for the tea plantation. But again after monsoon rain recedes, they do not carry as much water to be drawn for irrigation. They are never used for domestic purposes. During dry seasons, water for the irrigation of the tea bushes is drawn from the River Balason flowing of the plantation. But it is not at all economical to draw water from the river flowing 4 km down at the west end and transport the water to tea bushes located on much higher ground.

4.2.3c Natural Springs

The Darjeeling Hills is blessed with many natural springs; from these springs most of the people draw their safe drinking water. Normally, a spring that supplies safe drinking water is located far away from the villages. Any natural spring originating close to human settlements soon tends to become contaminated due to unhygienic activities by humans and livestock. Such springs are mostly utilized for purposes other than drinking, such as washing clothes, or for cattle and irrigation. These days, with an expansion of human settlement in the far-corners of mountain areas, natural springs with unpolluted water sources have become quite rare. According to some

records, there were about 30 natural springs originated in the hills of Darjeeling in the past, but they have been reduced to 24 springs in the catchments area. Due to constant leakage and loss of water, not to mention the drying up of many feeding *jhoras* (springs) and the growing local population and tourists water shortage has become a perennial problem in this region.

In any tea plantation like Singell, it is the responsibility of the plantation management to provide clean and safe drinking water. This process involves drawing and storing of water from natural springs and purifying it. In the absence of cultivation fields or livestock, the households of Singell do not have to worry about watering their crops or storing water for animals. But, in the absence of any natural springs in the tea plantation land, the management has to bring water from a water fountain located on the St. Mary's Hill in the east of the estate. In the past, when the water distribution was very poor, some small springs were reported to be used by workers. But perhaps, with the extensive use of DDT, and other pesticides, the springs were contaminated. Today, under the strict regulation of State Health Department, the management has to purify the water before distributing it to different 'labour colonies'. Singell Tea Estate Plantation has rather efficient water distribution system in which each household is connected by small pipelines. These pipelines are in turns connected to the main water pipeline of the plantation joined to the water tank that receives water from the natural springs after being purified. However, due to rather scarcity of good water, the management supplies water only twice a day---morning and evening.

Mineral Spring has more smaller stream and springs, but they have been rendered polluted with more human settlements and intensive agricultural activities in recent years. Until the arrival of

RCDC, the community had to make their own arrangement for water. It used to take long time to fetch water from the springs located on the higher elevation. Mr. Anup, the president of a village organization sums this up when he says, “until about 10 years ago, our women folks and children had to get up early, carry earthen pitcher and walk miles before reaching a clean water source. . They had to walk twice or thrice in order to store enough water for cooking, washing and sundry works. Water was generally clean but during rainy season some children suffered and on some occasions even died of *diarrhoea and gastro-enteritis* due to lack of sanitation and medical facilities”. All that changed to a great extent in 2000, when an agency from Luxemburg sponsored to install safe water system. This was achieved by installing large water storage tanks at different places, connected by large aluminum water pipes. These large pipes carry water to different hamlets and distribute water to different households through a network of polythene water pipes. Nevertheless, the people in Mineral Spring are exposed to different water related diseases, because, unlike in Singell, each household have to ensure the purification of water by boiling or other means.

4.3 Socio-Economic Conditions

4.3.1 Community profile

People: The people of Mineral Spring and Singell Tea Estate are of the Nepalese origin.

Generally, they are in short stature, have mongoloid features with a yellowish complexion, flat nose, small eyes, and black hair. These features are quite distinct from those of the people in the plains 50 km down at the foot of the hills. Though, originally from Nepalese origin, these early settlers of Darjeeling prefer to be known as “Gorkhas”.

Ethnicity/Caste: Despite being people of Nepalese origin and having somewhat similar features, the residents in both places belong to diverse caste and ethnic groups. In fact, these different caste and ethnic groups living in the Darjeeling Hills fall under two major groups: Indo-Nepalese Group and Tibito-Nepalese Group. The Nepalese from Chettri, Newar and others having Brahmanic connection are of Indo-Nepalese group, whereas, those from Bhutia, Gurung, Tamang, Rai, Limbu etc., ethnic groups, are of Tibito-Nepalese group (Karan, Encyclopedia, 2005). The majority of the people in Dabaipani division of Mineral Spring belong to 'Rai' ethnic group, followed by small number from 'Tamang', and 'Thapa' ethnic groups. In 40 respondents selected for interview, 65% were 'Rai'. In the Hindu hierarchical society these ethnic groups are considered "general" caste, while small number of 'Chettris' who live here belonging to upper caste (Subba, 1989). Apart from these ethnic groups, there are a few households of the lower caste called 'Biswakarmas' and also a small number of hill tribe people, called Lepcha. Thus the community in Mineral Spring is ethnically diverse, with one dominant group.

In Singell Tea Estate, too, there is a diverse ethnicity, even though all of them are from the Nepalese or "Gorkha" origin. But the difference lies in the fact that these ethnic or caste groups are more evenly distributed in different 'labour colonies' (settlements of workers) in Singell than in Mineral Spring. On the whole, the Nepalese are from diverse ethnic groups: Tamang, Thapa, Rai, Lamas, Khawas and others can be found without the presence of any one dominant group. The absence of any major ethnicity or caste indicate the policy of the management of yore, to distribute, or rather scatter, the emigrant workers of same ethnicity in different tea plantations or 'labour colonies', to prevent any future dissent or unionism by people of the same ethnicity

(Subba, 2000). Another significant difference is that, unlike Mineral Spring, there are no tea workers from the Lepcha tribes or households belonging to lower caste groups in Singell Tea Estate.

Language: In terms of language, invariably all the inhabitants in this region speak the Nepali language. Historically, Nepali (the official language of Nepal) was not the mother tongue of most of the ethnic groups—each having their own distinct dialects. In later years, with the influx of emigrant Nepalese workers, the official language of Nepal acted as a *lingua Franca* between the ethnically and linguistically diverse communities. Gradually, the Nepali language was widely spoken as the mother tongue or binding language of the entire Nepalese community in Nepal or in Diaspora, even as dialects of different groups continued to exist in some crude form or they were completely lost in history (not having any script). However, after the ‘Gorkha Land Movement’ (1986-88), the Nepalese of the Darjeeling Hills, in a display of a distinct identity of their own prefer to call their language as “Gorkhali”. Despite the fact that Bengali is the provincial language, it is normally not spoken or even understood by the people in the Hills of Darjeeling District.

Religion: Keeping with the pluralistic religious traditions of India, all households exhibit some religious affiliation. It is difficult to find a household without some adherence to religion or religious practices. Though the majority of the people in both places are Hindus, there are people of other faiths and religious affiliations as well. Interestingly, in Mineral Spring (Dabaipani), from the 40 interviews conducted, all the ‘Rais’ were Hindus, while ‘Tamangs’ were associated with Buddhism. A couple of families have embraced Christianity while the Lepcha households practice their traditional religion. In Singell, once again Hinduism is the dominant religion. But in this place, aside from the Nepalese from ‘Tamang’ ethnic groups, most of households of

'Lama' ethnic groups practice Buddhism. There are a small number of households with Christianity as their religion, while there are some households, which follow the Baha'i faith, especially the youth. While talking to some people, I realized that the meditative exercise offered by this religion, as well as the absence of any ritualism, are among the reasons for its attraction to youth.

Social Organization: In both cases every hamlet had at least one village organization to carry out certain functions for the community. These village organizations, bound more by geography or convenience of place rather than political or religious affiliations, are commonly known as '*Samaj*' (informal social organization) in Nepali. Except for one or two isolated individuals, all interviewees reported being members of one or the other '*Samaj*' in their hamlets. All of them admitted that these informal social organizations play a significant role during some social events; they take charge of marriages, deaths, births, and settle minor disputes amongst the community members. Except in the lower hamlets of Singell Tea Estate where the social organization is also engaged in an environmental promotional programme, all those interviewed said that the roles of different '*Samaj*' are confined to merely social functions or ceremonies. The strong membership to these '*Samaj*' in the Nepali society can be gauged from the fact that out of 80 interviewees, only seven said that they did not belong to any social organization. But these were either too old, sick, or worked outside the place. Ironically, managers/asst. managers, despite being Nepalese, keep out of these social organizations. This has to do with the protocol—managers should not mingle freely with the working class except for certain special social events or ceremonies.

4.3.2 Ownership Rights

In any conventional plantation, it is the government that has the ultimate ownership of the plantation land. According to the West Bengal Estate Acquisition Act (1953), the government leases land for 30 years (able to be renewed on reaching the stipulated year) while collecting yearly revenue- tax and land rent. Under the terms and conditions, companies, proprietors or individuals leasing the land, become the official owners of the land, as long as the revenue-taxes and land rents are paid. Moreover, the incumbent owner(s) are endowed with the power to sell the plantation to a new buyer during their ownership period.

In Singell Tea Estate, the plantation workers have no ownership right; they are merely daily wage earners with no control over plantation assets, or participation in decision-making processes (ICIMOD, 2003). They are, as it were, part of the plantation assets that is sold or bought from one owner to the next. Legally, then, they have no property rights as such. However, in reality, the workers in Singell Tea Estate claim to have some property rights—ownership of their ancestral houses that have been built and repaired by successive managements. While the management has the power to evict families without any plantation work, there has not been any recorded incidence of family eviction. When mentioned this to a resident who had no plantation work, he said, “Though none of my family member has any plantation work, no management—present or future—can evict us, since we have inherited this labour quarter (referring to the house) from our parents”. Perhaps, due to fear of the trade unions and local political parties (whose vote bank is formed of plantation workers), successive managements have never dared to evict any family; so, the working and non-working households of Singell Tea Estate treat the management given houses as their property.

The ownership rights in Mineral Spring changed dramatically after the closure of the plantation as it led to a land-grabbing spree by the workers' community. Around 1993, the land revenue office issued 'patta' (government land-paper) to the landholders of different hamlets in Mineral Spring. The issuance of *patta* grants full ownership right of their properties to the households. Interestingly, though, there is a disparity as far as land ownership is concerned in Mineral Spring. According to a member of the local NGO, who had acquired the papers from the Land Office, the average land holdings of the people of the place are 1.24 hectares but the largest landholder owns 4.42 ha of land as against barely 0.04 ha of land by the smallest landholder. But as far as property rights are concerned, the tea farmers of Mineral Spring are legal owners of the land they occupy and cultivate. So, in technical terms, hamlets in Mineral Spring have 'revenue' village status while those of Singell have 'non-revenue' village status.

4.3.3 Present Operational Set-up in Two Cases

After many changes that took place in the tea industry of the Darjeeling District towards the fag end of the millennium, both Singell and Mineral Spring plantations quite a few changes. Singell, despite maintaining the status quo, switched from orthodox tea to organic tea cultivation, with significant stress on sustainable land use practices. Mineral Springs has been transformed into plantation of 'small tea cultivators' where tea is just one of the cash crops cultivated in the erstwhile tea plantation land, now owned by more than three hundred households. Perhaps, the only commonality between Mineral Spring and Singell is the cultivation of organic tea. This section will compare the prevailing operational set-up of these two 'plantations' in respect to their tea production, processing and marketing strategies, under different management systems.

4.3.3a The Management Systems

At the outset it can be said that Singell and Mineral Spring Plantations are very different as far as current management systems are concerned even though, Mineral Spring once had top-down management system as well. Generally, the organizational order in a typical command-and-control or top-down management system, as existing in Singell Tea Estate, has a vertical and horizontal mobility of personnel. The hierarchical order of organization is comprised of a board of directors (headed by the managing director) at the top who are responsible for the running of a number of tea estates. They have the power to appoint the managers and assistant managers and some other officials in different tea estates. These local executives (Managers) carry out the directives of the owners and are responsible for the day-today running of the plantation. The organizational order in Singell Tea Estate has a manager and three assistant managers who supervise the day-today works at tea processing unit and three divisions of the tea estate. Below the managerial or local executive staff, there are some routine non-manual/partly manual/non-skilled manual workers who form the horizontal level of management with some authority over their peers in the field of pruning/ plucking, collecting of leaves, and manufacturing (Sarkar, 1984). The authority from the vertical or top order trickles down to the personnel at the horizontal order to enforce the assignment to the labour force at the bottom level. Thus, in a top-down management system, there exists a hierarchical style of functioning, which reflects differential command over resources (Sarkar, 1984).

This somewhat rigid organizational set-up, notwithstanding, Singell Tea Estate has ventured into incorporating some pioneering features in its management system under the umbrella of TPI Ltd., (Tea Promoters, India). It has been inducting into its management, and is still encouraging

recruitment of, qualified *local* personnel for the posts of managers, assistant managers, welfare officers, and even directors. In this sense it has become a unique tea estate, where qualified, local skilled personnel have been made part of the management, keeping in view that the locals are better placed to understand the mind-set of local workers.

Mineral Spring, on the other hand, no longer has a hierarchical top-down management system, having lost its status as a conventional plantation in late 1960s. While it was without any management system (for about three decades), it was given a new impetus in late 1990s. In 1998, about 486 families belonging to about 20 hamlets from three divisions—Harsing, Dabaipani, and Yangkhoo—came together to form *Sujukta Vikas* Co-operative (SVC), which means ‘development through united cooperation’. It is a type of community-based organization, which focuses on the management of different community resources by the community. Comprising two to three representatives from each hamlet, it democratically elects a working president, secretary, treasurer, and working members. The SVC Hamlet Committee, as the organization is widely known, is a democratic and decentralized organization. It was started with the initiative of a local NGO to manage, a milk cooperative but has since expanded to manage the tea production and marketing for small tea cultivators. SVC mainly manages the marketing of organic green tea leaves under the aegis of the local NGO. In addition, it oversees and monitors the manuring of tea bushes and pruning procedure, specific to bioorganic tea farming. Being a community-based organization, it is not each household but the *Sunjukta Vikas Cooperative* personnel, as the representatives of their hamlets, through their executives who decide the nature and quality of the tea produced. But, this system is still in nascent stage. It has a long way to go before it can be considered an alternative management system to the top-down type.

4.3.3b Tea Production and Processing

The biggest difference between these two cases is found in the realm of tea production and processing. Tea is the single cash crop in Singell Tea Estate, while Mineral Spring is now a poly crop system of production where tea is grown along with other cash crops (orange, cardamom, ginger, broomstick, and some subsistence vegetables). This means that all cultivatable land in the former case is taken up by tea plants while in the latter case, tea plants have to compete for space with other cash crops. In Mineral Spring, the expansion and reduction of the land for tea depends upon the profitability or loss incurred by the household while, in Singell Tea Estate, tea remains the only crop to be planted and replanted irrespective of profit or loss.

In one area, however, the two plantations share something in common—the production of bioorganic tea. The initiative for bioorganic tea cultivation in Singell was taken in 1989, by West Bengal Tea Development Corporation (WBTDC) Ltd. However, due to inconsistencies and other factors, the plantation could not produce organic tea in good quantity until recent years. After being laid off for many years, in late 1990s Mineral Spring workers got a new impetus for tea production amidst other crops. These days, the people of Mineral Spring as small tea farmers produce bioorganic tea in their own fields. Marketecology of Switzerland has certified both the plantations “Bio-organic tea gardens”. Cultivation of bioorganic tea entails use of dung and compost as manure to get rid off acidity and soil inertness caused by a lengthy usage of chemical fertilizers, pesticides or herbicides. The community of Mineral Spring has been successful in this endeavour due to regular use of dung and green compost. The rearing of livestock by households provides a ready supply of dung while weeds and other green vegetation from the fields are used for preparing green compost. However, this present willingness by people is in

stark contrast to the initial reluctance that the NGOs had to face. As an NGO member puts, “initially it was quite frustrating to get peoples’ cooperation in switching from use of chemical fertilizer to bio-organic manuring”.

Due to demand for a huge quantity of dung in such a large area, the present management of Singell has resorted to other means of feeding its land, made acidic by long use of chemicals. In Sri Lanka, the methods that have been suggested for maintaining an effective soil cover during the replanting period after uprooting the old bushes of tea are mulching with lopping of Guatemala grass (*Tripsacum laxum*) or Mana grass (*Cymbopogon conforatiflorus*) (Krishnarajah, 1999). In Singell, Guatemala grass is planted for the purpose of mulching, thereby giving not just effective soil cover but providing organic manure as well. Moreover, with the help of a German soil scientist, Vermicompost is prepared in the field. The vermicompost works as an excellent fertilizer while the liquid extracted from it, effectively substitutes the pesticide. While the two plantations differ in many respects, the biggest difference lies in the quantity of tea produced. Singell Tea Estate, with tea as a mono crop produces about 60,000 kg annually on about 262 hectares of land, whereas, Mineral Spring with much smaller number of tea bushes per household and an emphasis on poly crop, manages only about 6,000-7000 kg of tea annually.

Tea processing—an integral element of manufacturing—is another area where Singell and Mineral Spring differ. Singell Tea Estate, like most well established tea plantations, has a processing unit, commonly known as a ‘tea factory’, where all the green leaves, after being plucked, are processed into organic tea and a small amount of orthodox black tea. Presence of the tea factory would make Singell Tea Estate quite independent as far as operation of a plantation is

concerned. The tea farmers of Mineral Spring have no processing unit of their own (destroyed in 1968). So the green tea leaves plucked by households and collected by the paid members of SVC are dispatched to Salimbong Tea Estate for processing. Absence of tea processing unit makes the tea farmers of Mineral Spring dependent on other tea estates. Having their own tea-processing unit will make Mineral Spring community more independent in marketing and choosing their own buyers.

4.3.3c Marketing Regime

Marketing of the tea product is an integral part of a tea plantation. Singell Tea Estate, while still going through auction markets—the most traditional way of marketing – has also made new endeavour. The assistant manager of the tea estate reported, “Under our present company TPI Pvt. Ltd., we have found bioorganic tea buyers in Western Europe, particularly in Germany. Having direct contact with the buyers fetches good money and also helps avoid much of the hassle of going through the auction”. Today, the bioorganic tea produced in the plantation is mainly marketed (exported) to Germany and to a lesser degree to France under the brand name of TPI (Tea Promoters, India). The orthodox black tea is sent to the auction market in Kolkata under the same brand name. Whether the plantation has started getting surplus of the profit due to better price on organic tea is still not known. But, if the company’s income through sale of tea to European buyers has increased, then workers have no share in them, as they do not receive increase in their wages.

In the absence of a processing unit, the small tea farmers of Mineral Spring have to depend on one of the tea estates under the management of TPI for the processing and marketing of

bioorganic tea produced in their fields. Here the whole marketing process becomes a long and somewhat complicated procedure. However, with the visit of Altericoh, a German importing agency, the marketing scenario for small tea farmers has changed significantly (RCDC, 1996). The agency (Altericoh), that acts as the promoters of bioorganic tea produced by small tea farmers around the world, markets the Mineral Spring tea product under the name—*TopqualiTea*, with the tag of ‘small farmers of Mineral Spring’ attached to its brand name. Nevertheless, the fact of the matter is that the small tea farmers of Mineral Spring have control over their production but not in the processing of their product or choice of buyers in marketing.

4.3.4 Livelihood Sources

It has been alleged that, in the pre-independence era of India, the tea industry lobby had blocked the entry of other industries such as horticulture, sericulture and tourism that could serve as alternative livelihood sources for the people of this region. After independence the pathetic situation continued; yet many people were absorbed in some public and private sectors, apart from getting different unskilled jobs that gave them some livelihood options. In the last three decades, the increasing population and unavailability of work in the tea plantations have compelled many plantation residents to search for new livelihood options. This is made relatively easier these days due to availability of skilled and unskilled jobs in tourism, hotel and different public/private sectors. The following are the livelihood sources available in and around the two study areas; some constitute primary income sources, and some others secondary or tertiary livelihood sources. Fig.10 shows different sources that constitute primary sources in two places.

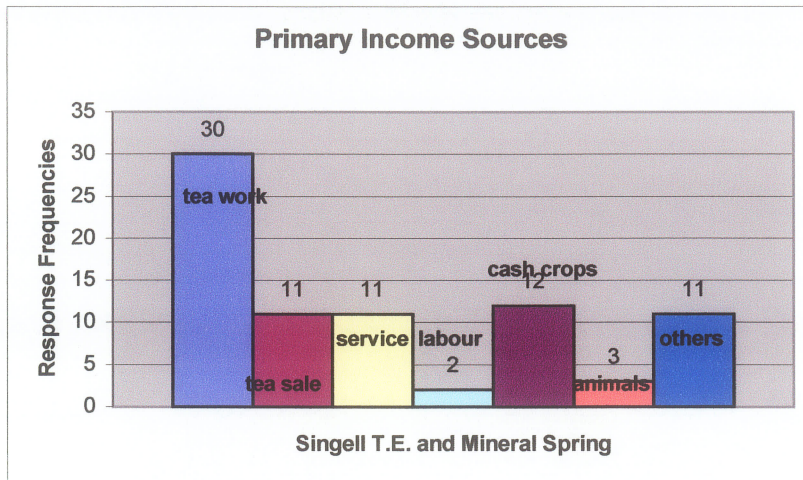


Fig. 11: Chart showing the primary sources of 80 respondents from two case studies

4.3.4a Tea plantation work

In Singell, tea plantation work still constitutes the chief income source and sometimes the only source of livelihood. A general survey on income sources from 304 households in the Upper Division of the tea estate (where the study was conducted) revealed that, 215 (70%) households were engaged in plantation work. Out of the 40 respondents taken for interview, the primary income source of 75% of the households came from plantation work. Plantation work varies from the work in the tea factory to picking or pruning of leaves, and cleaning or spraying the tea bushes in the plantation. But, with a drastic cut in the plantation workforce, it is rare to find a household with more than two members employed in tea work. Out of 40 respondents, only three households (10%) said two members had work in the plantation. The general survey revealed that there were no households in any hamlet where more than two members were employed in plantation work. This has not only increased the unemployment problem in Singell Tea Estate but has also caused frustration among the resident, even though they are aware that this reduction

in plantation work began about forty years ago. Mr. Ranjan (76 yrs) a retired factory worker, sums up the general feeling of the unemployed plantation residents:

“When British Administration managed this tea estate, everybody, even youngsters got job in the plantation. But somewhere around 1965 things changed when the managements across the hills of Darjeeling reduced the plantation work to just two per household. On retirement two jobs were passed on to their offspring; if there were more than two children, the rest became unemployed and thus, unemployment problem is increasing with every generation”.

Generally, the pay scale varies according to a hierarchical order—the higher one is in the plantation organization, the better are the pay and benefits. Thus, the executive staff (managers, assistant managers and welfare officers) gets the highest pay, with other benefits not enjoyed by the workers at a lower level. The clerical staff and field/factory supervisors, known as class III workers, also enjoy relatively better pay and benefits than an ordinary labourer. The tea plantation workers or labourers (tea pickers, cleaners, sprayers, pruners and sundry workers) are paid the lowest wages and have only the minimum benefits enumerated in the Plantation Labour Act (1951). Irrespective of the years of work experience, the wages of the old and new workers are same—the pay scale varies only in the amount of gratuity and provident fund depending upon the years of work at retirement. At present, all plantation labourers in the Darjeeling Hill under the DPA jurisdiction receive an average wage of Rs. 44.70/day, plus 4 kg of rice and 2 kg of flour every 12 days. A further 2 kg of rice and flour is added for every child (below 18 yrs.) in the family. Wages are paid according to the number of workdays; i.e., wages are paid and ration distributed for only 24 days with Saturdays being half-working days and Sundays non-working

days. From this one can understand the poor socio-economic condition of a household with many members and just one earning member.

4.3.4b Tea Farming

After the closure of Mineral Spring Plantation in late 1960s, people lost their tea plantation work. In late 1990s, these former plantation workers ventured into tea farming as one of their sources of livelihood. Most of the tea bushes were left on the land people grabbed from the former Lebong and Mineral Spring Tea Estate. Beside tending and nurturing these remaining tea plants, most households also re-planted new tea bushes, and with the guidance of 'SAIGON TEA' consultancy, began organic tea cultivation.



Fig. 12 Tea Farmers of M. Spring

Fig. 12 shows households growing and picking tea leaves from their private-owned land. During peak season (April-July), tea yield in Mineral Spring varies from a low of 5kg/day to a high of 55kg/day. But in the off-season (Aug-Oct.), the average yield falls to a low of 3kg/day to a high of 35/day collected by each household. The difference in the tea collection from different households depends on the following factors: 1)) acreage of tea cultivation, 2) age of the tea

bushes, and 3) investment in tea. In Mineral Spring, the household with highest landholding (4.42 ha.) has the highest number of tea bushes--old and new. Generally, these households invest more money on tea and so get the maximum profit in return. Since, 1998, the green tea leaves from the tea farming community (sold to Salimbong Tea Estate) have been fetching each tea farmer/cultivator Rs. 24/kg of which Rs. 20/kg is earned in cash. The remaining 2 rupees for every kilogram of tea goes into savings as Provident Fund, while the remaining 2 rupees of every kilogram profit is paid as salaries to the 'tea collectors'. Generally, from April –October, the tea green leaves are plucked twice a week. On an average, a tea farming households, with the lowest yield earn Rs. 1000/month while households with the highest yield earn up to Rupees 16,500/month.

From the interview it became clear that almost all households in *Dabaipani* division of Mineral Spring cultivate organic tea. However, only 27% of the 40 persons interviewed admitted that tea was their primary source of income. One of the reasons for this was that many households still allotted more land space for other lucrative cash crops than for tea bushes. Moreover, average households with little more than one hectare of landholding, invest their money in crops that generated more money in a short time; yet most household cultivate tea that generates low income but for much longer period. As Rohit (51 yrs) puts candidly, “most of the households get their primary income from the sale of cardamom or ginger. However, tea is a very important source of our income because it gives rather good and steady income for six to eight months in a year, which is a good money”.

4.3.4c Cash Crops

In the late 1990s, Mineral Spring acquired a unique status in the region. From being a land, having monoculture tea, it was transformed into a revenue village of poly crops, which could generate high income.

Table 5: cultivation of different cash crops from 40 samples in two study areas

Name of study area	<i>Ginger</i>	<i>Cardamom</i>	<i>Broomstick</i>	<i>Orange</i>	<i>Potato</i>	<i>Other crops</i>
Mineral Spring	28	6	5	3	8	10
Singell Tea Estate	0	2	0	3	0	1

Today a variety of cash crops such as, ginger, cardamom, broomsticks, oranges, and so on are being cultivated in the Mineral Spring area as they fetch large revenue for the majority of households. Of the 40 interviewees, about 30% of households said cash crops constituted their primary income source while about 50% of the households said it constituted a secondary or tertiary source of income. That's why, a large portion of each household's property is dedicated to the cultivation of such cash crops. Even though, most of these cash crops are seasonal in nature, they fetch huge income; so much so that, for many households the sale of tea become a mere supplementary income. On an average, every household produced about 10 kg. of ginger, though cardamom and oranges were not produced in the hamlets located on higher altitude.

In contrast, in Singell Tea Estate, only 15% of those interviewed reported having any cash crop in their back yard; this small number of household cultivated small quantity of cardamom, orange or some vegetables as cash generating crops. The *table5* above illustrates the type of cash crops the community in Mineral Spring is cultivating as compared to the community of Singell Tea Estate.

4.3.4d Animal Husbandry

In both the study areas, animal husbandry consists of dairy, poultry, a piggery and/or the rearing of goats. In Nepalese culture, except for poultry or dairy the ethnicity of the household determines the kind of animals to be reared. Therefore, according to the customs, households belonging to 'Rai' ethnicity can rear pigs but not goats while the 'Tamang' and 'Chettri' households will rear goats but not pigs.

In Singell Tea Estate very few interviewees reported having their supplementary incomes coming from animal husbandry. A small number (2%) said they had dairy cows from which they sold locally 2-3 litres of milk a day. Another small number (7.5%) reported rearing some goats, pigs or chickens for sale as well as home use. A near absence livestock in Singell were mainly due to lack of space. In Mineral Spring, about 35% of the households reported to be rearing some kind of livestock as opposed to 'almost all households reported having cattle' according to RCDC (1996) report. But once again with a rise in milk prices and the usefulness of cows for organic farming, the number of households rearing dairy cows has increased. Much smaller numbers, however, reported rearing pigs or goats even though the income from the sale of a live pig or goat can be as high as Rs. 2500 to Rs. 3000. But with increased facilities of selling milk to

urban centres more and more households are planning to rear cows. Also it has another advantage—dung can be easily used in the field for organic cultivation.

4.3.4e Subsistence Farming

Apart from tea and other cash crops, people in the hills of Darjeeling also depend on subsistence farming to varying degrees. For the people living in the plantation however, there is little land available to engage in subsistence farming. Hamlets within the tea estates fall under the purview of the Plantation Labour Act (1951) and hence are considered non-revenue villages where the livelihood of the community depends on the wages earned from work in plantations rather than from the field. Except for one household with a few acres of land outside the tea plantation, no other person in Singell Tea Estate reported being engaged in subsistence farming. I observed that a few households meticulously utilize the small plot available in their backyard as kitchen garden for growing vegetables or some pepper for home consumption. However, the general feeling among the people is that of anger for not given even half an acre of land for cultivating some vegetables and thereby saving some money. A university student and resident of the plantation opined: “I think the first management of this tea estate allotted almost negligible plot of land to make sure that people did not get any extra income from the land or kitchen garden. And subsequent managements never increased that plot of land so that workers can not earn anything from their fields”.

After the closure of the plantation, the people of Dabaipani (along with the adjacent divisions of Harsing and Yangkhoo) were compelled to clear the land for cultivation of millet, potato, maize and some green vegetables. In recent years, however, with major income coming from cash

crops and tea, subsistence farming is less prominent. Notwithstanding this situation, almost every household is engaged in some subsistence farming. Millet, potato, corn (maize), tomato, onion and some seasonal vegetables are being cultivated in terraced fields. And, instead of ploughing the field, people till their terraced fields using spades or hands, so as to prevent the soil from eroding. In most households subsistence farming is done for home consumption (with occasional sale). Therefore, relatively small areas are allocated for this purpose or it is practiced in the land laid vacant after the season for cash crops is over.

4.3.4f Off-land employment

Due to limited job availability in the tea plantation, many residents from different tea estates are seeking employment outside plantations. In Singell Tea Estate also, due to increasing population and decreasing permanent employment in the plantation, growing numbers of people are seeking jobs outside the plantation. The limited work opportunities in the plantation have compelled the erstwhile tea plantation community to work in the government and private sectors, such as tourism, educational institutions, and hotels, as well as the unskilled labour jobs available in road repair and construction. Of the 40 interviews conducted in Singell, about 30% of the households depended only on off- land employment for their livelihood. On the other hand, about 42.5% of the households had some members who supplemented family primary income from plantation work through off-land employment. A few individuals worked as labourers in road construction undertaken by the Darjeeling Gorkha Hill Council; some individuals worked as casual labourers while educated individuals worked in government offices or private sectors in Kurseong Town about 1.5 km away. Besides these, a good number of the residents worked in. The road construction workers of Singell tea estate earn Rs 70-80 a day while casual workers in the town

earn up to Rs. 120 a day. The government jobholders are paid salaries ranging from Rs. 3000 to 8,500 a month. Thus, with the tea plantation unable to sustain the livelihoods of the increasing plantation population, there is a greater trend towards off-land employment as seen in the Singell Tea Estate. However, the researcher also observed many people idling, gambling or passing their time playing Bingo.

A revenue-village like *Dabaipani* Division of Mineral Spring presents a contrasting case. Since the land provides the most important revenue for the community, the majority of the households commit their entire time and energy in their fields. As a result, only 7.5% of the 40 interviewees in Dabaipani division said that outside jobs constituted their primary sources of income, while 10% admitted that some members of their household work outside—either as road construction worker, elementary school teacher or in the army. When asked, “Does any member of your family work outside?” most of the interviewees said “No”. The chief reason for less dependence on off-land employment is the increased profits that the work in the land has brought forth. In addition, there is no population pressure yet in this area; so a smaller population can comfortably support themselves from the produce of the land without depending on any outside employment. So most households work in their fields to increase the productivity of tea, cash crops or animal husbandry.

4.3.5 Summary of the key findings

1. The transition from British administration to Indian Independence, and the corresponding transition from British to Indian management of the Darjeeling tea industry, precipitated a series of crises in the tea industry. Changes in ownership and the lack of trained and efficient Indian

managers meant that over-age tea bushes were not replanted, resulting in low production and degradation of over-used land.

2. Following Independence, efforts to form trade unions, suppressed under British rule, led to worker unrest and lockouts at some tea estates. The coming to power of the CPM Government in 1977 with strong labour support, and the creation of the Darjeeling Hill Council in 1993, led to interference in management of tea plantations that further complicated the problems. These issues caused socio-economic instability of workers, instability of local economy, and a gradual decline in tea industry of Darjeeling.
3. The two study areas, Mineral Spring and Singell Tea Estate, provide examples of the problems in the post-independence period. Both were declared “sick gardens” before being closed temporarily (Singell) and permanently (Mineral Spring) leaving the plantation workers to face socio-economic hardships. Findings also show that with no other viable livelihood alternatives available, the circumstances compelled people to fell trees, selling them for timber and charcoal.
4. Mineral Spring experienced a permanent closure. This resulted in the deprivation of the community’s only livelihood source—plantation work, until the Hayden Hall Institute (a local NGO) intervened to improve the socio-economic conditions of the people through different development programmes. Since 1997, under the aegis of RCDC, another local NGO, the community formed *Sunjukta Vikas Co-operatives*, which functions as community-based management organization in the production of organic tea. The community’s livelihood security was further enhanced with the alternative income coming from their cash crops and livestock; thereby improving its overall socio-economic condition.

5. Singell Tea Estate, having experienced recurrent labour relations problems that threatened its economic viability throughout much of the post-Independence period, has persisted as a plantation and, since 1999 under TPI Ltd., has improved its economic situation and the livelihood security of its workers as a result of a more participatory form of management.

6. Landslides and soil erosion in the Darjeeling region, due to long-standing deforestation and post-independence development, are widespread. However, in both study areas, efforts to reduce deforestation, combined with reforestation/aforestation measures and improved drainage, have contributed to a considerable reduction in these processes as compared to adjacent plantations.

7. However, local landslides and soil erosion in the two study areas due to road construction has increased. People of both places see roads having positive impacts due to increased access to urban markets and services leading to improvements in their social-economic situation. Past experience suggests that the geo-ecological impact of new road construction is temporary and outweighed by the on-going positive economic impact of these infrastructure improvements.

Chapter 5: The Impact of Tea Plantations on the Geo-Ecological and Community Socio-economic Conditions

In this chapter I present the findings of the impact that tea plantations have had on the geo-ecological aspect of the place as well as socio-economic conditions of the community. The first part of the chapter deals with impact of the tea industry on the geo-ecological aspects, especially in the form of deforestation and its effects such as landside and soil erosion. The impact on the livelihoods of the communities and its linkage with depletion of natural resources will be presented. This section will also emphasize findings on how the sustainable use or misuse of natural resources in the two study areas may have resulted in increase or decrease of different erosion processes.

5.1. Geo-Ecological Impact

5.1.1 Impact on Natural Resources

In the past, the Darjeeling area had witnessed depletion of its resources, particularly the destruction of forest resources, due to the initial establishment and subsequent expansion of tea cultivation land (O'Malley, 1907). The depletion of forest resources did not stop, even though, further expansion of tea plantations slowed after India's Independence. In fact, to this day, forest trees are a main target by humans in this area, as they are considered a most valuable resource; used for timber, housing, firewood, charcoal, and other purposes (Lama & Sarkar, 1986).

From the study in the two cases, it was found that both in Mineral Spring and Singell, forest resources were depleted to a great extent after India's independence – by the managements for

construction of houses and by the plantation residents for fuel wood or charcoal. While it is not possible to single out one particular phase during which the highest deforestation occurred in these two places, in the interview the following factors were mainly considered responsible for making dense forests into sparse one: a) Developmental activities (construction or repair of houses), b) Supply of firewood for workers and c) Illegal felling of trees by ordinary people for economic reasons.

In Singell, the impact of long-term felling of forest trees by different managements and people led to serious deforestation in and around the plantation, so much so that, today only some trees stand scattered in once dense forest area. This depletion had an indirect impact on land as well as water resources. Surender (77 yrs), a senior plantation worker, points out, "When I was growing up, there were fairly dense forest around this place. But everybody, people as well as managements, started felling large trees. Because of that indiscriminate cutting of large trees, some areas in the plantation have become devoid of trees and many small landslides and soil-erosion take place every year while water springs are drying up".

In the last one-decade or more, however, both these places are witnessing a reversal. There is a healthy trend towards reforestation, and there are already signs of new tree cover in this place. In Mineral Spring, the majority of people interviewed responded that tree-cover has increased in recent years. On the question, "Do you think the trees in and around your place have increased or decreased compared to 10 years ago?" even the people of older generation said that there were more trees today than there were was in the past. As an observer I found Mineral Spring covered with dense vegetation, which resembled a forest from afar. This dense tree cover has led to a

positive impact on the place—landslides have reduced, the moisture has been retained and decline of water table has been arrested. But the vegetation or tree cover has not become dense all of a sudden; it is not the result of people not using trees for fuel wood or fodder anymore. The people of Mineral Spring still use trees for fuel, for timber, for building houses, and as fodder for their cattle. But today they use them responsibly—making sure they replace the trees they use by planting more trees. During interviews, almost everyone said emphatically that if they cut one tree, they make sure to plant ten more trees in their fields. When asked the question, “Will they not cut trees from the forests if the trees from their field will get exhausted one day before their planted trees grow big enough to be used?” Sudhir replied, “We do not need the forest for firewood or other purposes. We plant fast growing trees, such as, *Ootis*, *Malati*, *Nerket* and so on, that grows quick enough to be used in short time”. These are beneficial in more than one way: they grow fast enough to provide firewood, timber for houses, and fodder for cattle; they become strong quick enough to provide preventive measures against landslides. Hence, one can say that the tree planting steps taken by all the households has had significant impact on the geo-ecology of this area. This has stopped deforestation and reforested the area; thereby, it has minimized the landslides and other erosion processes.

In and around Singell Tea Estate, the presence of large trees are almost negligible, measures are being taken by the management and the community to reforest the area with large trees. Although the large landslides or soil-erosions are few and far between, the places laid bare due to deforestation of yesteryears have been susceptible to landslips during rainy seasons. Walking around the tea estate I could observe many nursery plants other than tea bushes have been planted all over the place, particularly on gentle slopes. It will take some years before the impact

of tree planting measures can be witnessed. However, one thing is certain—in the future, this reforestation measures undertaken by the tea estate, along with other steps like good drainages, will minimize geo-ecological problems caused by deforestation in the past.

Impacts from the tea bushes were not studied in depth. However, in Mineral Spring Plantation, when the people started uprooting bushes after the closure of tea estates, it caused soil erosion, which might have aggravated landslides in later years. But after it was either left to grow as wild bush until the late 1990s, it had positive impacts on stabilizing the soil. In Singell Tea Estate where the temporary closure did not lead to uprooting of bushes by workers has had less negative impacts on the soil of the place. On the contrary, tea bushes buffered the soil instability caused by housing construction and early creation of tea plantation. With no re-plantation measures taken, even though they had decreased in vitality, they could still control local and small landslides. In spite of current re-plantation of tea bushes in progress, the erosion has been observed to be minimal because of shallow nature of slopes of the place and careful planting procedure being followed by the management.

These environmental measures taken in these two study areas make them somewhat unique in this area. However, a careful analysis of the situation and circumstances of the place will help understand the factors that led the community or the households to initiate these environmental measures. In Mineral Spring, there were some factors that unintentionally caused the reforestation measures initiated by the households. In order to prevent further deforestation, the state government of West Bengal declared the remaining forests as ‘protected forest’, thereby, making the forest trees inaccessible for the public. Furthermore, the personnel from the

Directorate of Forest Division, the Land Reforms, and the Darjeeling Gorkha Hill Council were empowered to prohibit felling of trees and imposing sanction on the violators. These prevailing circumstances led households to plant trees in their own fields in Mineral Spring. And, since, households depended upon firewood for cooking and fodder for their livestock, they needed fast growing trees. Perhaps unintentionally, these strict forest regulations and also the need of firewood under those circumstance resulted in the planting of increasing numbers of trees, which now resembles a forest. Thus, a number of factors have indirectly helped in promoting a healthier environment and enhancing the natural resources.

The situation in Singell Tea Estate was different from that of Mineral Spring. Unlike the households in Mineral Spring who receive their firewood from their own fields, households in Singell do not have their own field or land to plant trees. Yet, there is an emphasis on reforestation and prohibition on tree felling. This has been achieved by providing the workers with LPG for cooking. Thus, in both study areas, the fear of sanction or imposition of penalty played a significant role in the protection or conservation of forest resources. There is one difference though in the approach for environmental measures: in Singell T.E. the management as well as some workers committees are jointly working on reforestation; in Mineral Spring, the measures are taken on household level.

5.1.2 Linking Natural Resources to Community Livelihoods

The history of these two selected cases show that during the time of temporary or full closure of their tea plantations, people faced acute economic hardships. These economic difficulties often drove them to cut down trees to sell them. During normal periods, tree cutting was much less. In

the words of one of surviving members of the crises, 81 year old Santosh of Mineral Spring, “When the tea estate was running smoothly, we rarely cut forest trees. But after the tea estate was shut down and our socio-economic hardship increased, people started felling trees, in order to sell them as timber, charcoal, and other products to sustain their livelihoods”. Sudhir of Singell Tea Estate also echoed similar view: “First time plantation residents started indiscriminate cutting of forest trees when the tea estate was temporarily closed in 1969. In order to feed the hungry family, men folks felled trees and sold them as raw timber or charcoal before buying food for the family.”

Generally, other available resources, such as land and water are not under as much pressure as forest resources. One of the reasons for this is that land and water were not the most important needs to sustain the livelihoods of people. They were available in abundance in the past. Moreover, during the establishment of plantations under British administration, settlement of workers took place in a very organized manner; plantation workers were not free to move about according to their own wishes, even within their tea estate unless assigned by the administration (Roy, 1965). But as the population started increasing in an alarming rate, it posed an imminent threat to the conservation and sustainable development of natural resources. This increase in population led to an increased pressure on land and forest resources as humans competed for land and fuel (Lama & Sarkar, 1986). In Singell Tea Estate, which is closer to an urban centre and an important road, the adjacent land is already witnessing some pressure. It is not just the people from the tea estate but also recent migrants from the plains have gradually encroached upon the land close to the road. With the increase in population (in and around this place), Singell Tea Estate land adjacent to roads and non-plantation land are witnessing gradual

encroachment. Growing pressure on the land resource is not yet seen in Mineral Spring area because of the abundance of land for a relatively smaller population and also because of demarcation of land by the landholders.

Previous monoculture use of the land for tea plantation in Mineral Spring had left the soil unsuitable for other crops. It was further aggravated by an extensive use of chemicals. Today, the community is trying to sustain the land by adopting organic cultivation. However, it appears that Mineral Spring may slowly head towards the degradation of land due to its constant and overuse. In recent years, after their success in high production of agricultural products, the people have ventured into fast economic development. The result is an intensive use of the land for the profit obtained from market-driven products (Brown & Shrestha, 1998). And, the demand from the market for produce and greed for quick profit on the part of the growers is already resulting in ever-increased production of these cash crops by all households. In Mineral Spring, due to the profitability of the cash crops, the same land is being used year after year. On a walk through the hamlets one cannot fail to observe every corner of the land being cultivated; no land is laid vacant. When I asked Rajesh, one of the village agriculturists, whether he was going to rest, now that ginger season was over, he quickly replied, "No, sir. I must prepare the field for cultivating onion, cauliflower and other vegetables. No household leaves the land vacant; neither will I do." Though organic cultivation of land entails quality rather than quantity of the product, it will not be surprising if some households, or even the community, may reintroduce chemical fertilizer for higher production and higher profits. Already some agricultural experts have pointed out to the people that ginger absorbs maximum nutrients thus rendering the soil infertile after continuous cultivation for many years. But people in Mineral Spring who need the good money coming from

the sale of ginger are not ready to reduce or stop ginger production in order to give rest to the land. In the long run, this can have a deleterious effect on the land, unless the people fallow or periodically rotate the current crops with more soil friendly crops like legumes.

5.1.3 Landslides/Soil-Erosion Issues

According to some early observers, the history of landslides in the Darjeeling area can be traced back to the large-scale clearance of forest cover and wasteland in order to establish and later expand the tea plantations (O'Malley, 1905; Sinha *et al*, 1975). Landslides of any significance that impact upon plantation lands are rarely reported in recent years. For the older generation in both study area, 1968 stands out as a year where incessant rain resulted in widespread landslides causing damage and destruction in many tea plantations. Starkel (1972) reported the destruction of about 800 hectares of tea plantation property as a result of incessant monsoon rain, lasting 3- 4 days. But landslides in 1968 were widespread in entire Darjeeling region (including Mineral Spring and Singell), along the roads, human settlements, tea plantations, and some forested areas. The triggering event for that year's landslides was heavy rain that led to the increase in pore water pressure and eventual erosion and landslides.

One of reasons for landslides being a somewhat insignificant phenomenon is a relatively shallow slope in both these places. From the interviews, I could come to one conclusion that landslides have not impacted these two places as they have some adjacent tea estate—Ambootiah that witnessed one of the largest landslides in Asia in 1984 (Ghosh, 1987). Perhaps the most important reason for the decrease in landslides in Mineral Spring is the increase in vegetation, (Fig. 13) either as tree cover or cropping that prevents ordinary erosion. Furthermore, in Mineral

Spring, the new agriculturists have made their lands into terraced fields, which generally prevents sliding of mud (though it does lead to erosion of soil). In Singell, on the other hand, the construction of drainages (Fig. 14), and avoidance of slope area for any developmental activities, have considerably reduced the occurrence of landslides.



Fig.13: Dense tree-cover in Mineral Spring



Fig.14: Drainages in Singell Tea Estate

That leaves road construction as the most significant cause for landslides in these two places. In both study areas, one can observe new roads have been recently constructed and some are still underway. Normally, the construction of a hill road involves felling existing vegetation, cutting and blasting otherwise stable hill slopes, and the rolling down of resultant debris, which in turn destroys vegetation and causes severe erosion resulting in landslides (Pant & Khanduri, 1998). In the course of these different activities, ground is excavated, huge rocks are removed and trees are uprooted, thereby disturbing the land and finally resulting in small and big landslips on both sides of the road. Interestingly, for the people of both places roads are very important, as they are

avenues for improving the socio-economic conditions of the place. For the people of both places, these landslides due to roads were inevitable and acceptable consequences of the development of the place. People were not very worried that in Mineral Spring, these road constructions have come at the expense of trees and some cultivation land, while in Singell they have come at the expense of about 10, 000 tea bushes being uprooted. But this also makes one point—for ordinary people, developmental activities outweigh environmental considerations.

5.2 Socio-Economic Impacts on the Community

5.2.1 Over-dependence on tea plantations

About three-fourths of the selected respondents were dependent on tea plantation work for their livelihoods. In fact, for generations, these households have had no other livelihood sources besides plantation work. But the situation has changed since the last decade or so; work is available in private and public sectors, besides the booming tourism industry. In spite of this, many members of Singell Tea Estate remain unemployed. On the question, ‘Is unemployment a problem in this plantation?’ the usual reply was, ‘Yes, unemployment is a big problem in this plantation because of increased population and also due to management’s policy on job cuts.’ But to an outside observer like me, it appears that main reasons for people’s unemployment are their over-dependence on plantation and a false sense of security that tea estate provides them. For those seeking livelihoods, there are no dearths of jobs in the Darjeeling Hills, at least in recent years. Traditionally, tea plantations provided the workers with housing, rations, electricity, water supply, bonus and other benefits, apart from daily wages. Workers are also provided with smaller items such as, umbrellas, slipper, and a thermal flask and hot case for food and plastic covering during the rainy season. These facilities and benefits are stopped once the worker loses

his/her plantation work. In the Act (1951), only permanent workers are entitled to these facilities and benefits. So, according to the terms and conditions of the Act, any household with no permanent tea work is deprived of all the facilities. This seriously impacts those who retire from their works and those who are afraid to seek work outside the plantation while continue to remain in their ancestral homes. The general survey of the place revealed that the illiterate and semi-literate people remain overly dependent on the plantations for their livelihoods. However, it was also found that even some well-educated people feel more secure doing some 'labour job' in the plantation, instead of finding job outside. It is true, that, due to increasing population and also due to growing number of educated youth, the competition for jobs is becoming stiffer in the employment market. Though there the accurate government census immediately after the Independence is unavailable, and so the table for trend of growth rate is not being displayed. However, the sudden increase in the population in the area cannot be gauged by the fact that the population of the district which was approximately 300,000 in 1951, has increased to 1.2 million 1991 and went further up to 1.6 million according to 2001 census. Nonetheless, the plantation community continues to over-depend on the fluctuating fortunes of their plantation.

In the past, the tea plantation had made the workers dependent so as to make them like slaves or bonded labourers. But even in 21st century, under free and democratic India, the plantation community has remained slaves to the plantation system; not entirely due to management strategy but due to their own insecurity. This becomes more evident during weeklong *bandhs* (strikes) called/sponsored by trade unions or some political parties. Interviews and discussions with people revealed that, since, the plantation labourers depend solely on their wages and rations from plantation for their livelihoods, they tend to suffer badly during strikes. When the

question was asked, "Are you affected by strikes called by parties or unions?" the usual answer of the respondents of Singell was, "No, because even during strikes plantation work go on". But when I asked them a realistic question, "What happens when GNLF (Gorkha National Liberation Front) supporters forcefully close all the plantations for a week or so?" Amrit one of the Class III workers, answered, "One or two-day strikes have no real impact on our lives. But, if the strikes continue for more than a week (which has happened in the past), then we, the plantation workers, suffer a lot, as we neither get our wages nor ration." It is in stark contrast to the households who live in the plantation quarters while working outside the tea plantation. They can always stock up their provisions before the strikes begin.

Under these trying situations, the small tea farmers of Mineral Spring have discovered a more sustainable livelihood. They do not have to depend on the sale of green tea leaves alone. In the event of a decline in tea business, they can fall back on cash crops and animal husbandry for their livelihoods. However, strikes impact them, too. In fact, in the last five years they have realized that they are more affected by strikes than the plantation people. On the question, "Are you affected by strikes called by parties or different unions?" there were mixed responses. But, Anima, one of the leaders of Women's organization said, "In the past when we had nothing to sell in the market, we were least affected by any kind of strikes. But, these days, almost every household is selling milk and other agricultural products in the urban markets. So, even one-day strike means loss of income; if the strikes continue for a week, then the product is not only, not sold, but it gets spoiled and has to be thrown away, which is huge loss."

5.2.2 Uncertainty of Tea Plantations

One of the biggest negative impacts the tea industry has on the plantation community is the uncertainty that surrounds it in 21st century. It is not just the tea plantations in the Darjeeling Hill but the entire tea industry in India is going through a phase of uncertainty. Due to fluctuating prices of tea products and increasing cost of production and maintenance, some tea plantations have been closed down; some are on the verge of being locked out while still others are limping along. While this phase of uncertainty affects the tea economy, it affects plantation community the most, as its livelihood and survival depends on the sustenance of tea industry.

During the interviews, some senior residents recalled the uncertainty that temporary closure of Singell Tea Estate in 1968 had brought. Once again in the 1980s-90s, the residents felt just how fickle their plantation work can be when payment irregularities and other troubles started in their plantation. Today's management, under TPI, Ltd., is apparently more stable with no trade union-led strikes or payment irregularities. However, when asked if plantation life is secured, many respondents raised apprehension. The present management has tried to bring stability and thus more certainty in the plantation works by giving wages, ration and bonus on regular times. But the Singell plantation workers are not unaware of the crisis being faced by their neighbouring tea plantation workers in the Balason and Margarate's Hope Tea Estates, as well as the closure of V-Tukbar and some other estates in the Darjeeling sub-division. This creates a great uncertainty for any tea plantation in the Darjeeling Hills, including the Singell Tea Estate.

In a group discussion, many expressed uncertainty surrounding their lives in the plantation. As Luxmi, a tea-picker woman said, “every time we hear some tea estates being closed down, we think, perhaps, our tea estate will be the next one to be closed down. And then what would we do to feed our children and to sustain our livelihood”? Most interviewees also expressed anxieties over the future of their children in the plantation. Many fear that, with the continuing crisis in the North Bengal tea plantations, most of the workers will be employed as casual or seasonal workers without any benefits. Many people have also lost faith in trade union leaders who seem not to work for the welfare of the plantation community but rather for their own selfish interests. People recall an article on a local newspaper that tried to expose the nexus between the management and trade unions. The management of Glenburn Tea Estate, located not very far from Mineral Spring, had fled due to financial problems and their inability to pay wages and benefits to the employed workers. In February 2004 the two parties negotiated a “settlement” with the Himalayan Plantation Workers Union under which 300 workers would be laid off as a precondition for reopening that tea estate. While this incident has dented the reputation of local trade unions, one cannot forget their contribution in safeguarding workers’ rights and constant fight against injustice with powerful lobby of tea producers. These incidents further increase the anxiety of the plantation workers and put their socio-economic situation in great uncertainty.

The tea farmers of Mineral Spring do not have to face a similar uncertainty or anxiety over their future. The community of this place underwent a miserable phase after their conventional tea estate limped for several years before closing down. Presently, with the new system of tea cultivation as poly culture, (along with other cash crops and livestock), there is no anxiety over an uncertain future. In the event that Salimbong, their processing/marketing tea estate closed

down, they can find other tea estates for processing and marketing their organic tea. When asked, “how they see their and their children’s future”, Ramila (47 yrs), a mother of four children said, “Today we have different sources of income; if one fails, we can fall back on the other. If, say, Salimbong Tea Estate refuses to take our tea leaves, we can still sell them to other tea estates or even in the local markets. And if no one buys tea, we still have other agricultural products as source of our livelihood.” Nevertheless, these tea farmers, too, need tea-processing units in the place and a direct means of exporting to the buyers overseas. This move will bring in more steady income and quell any marketing uncertainty; thereby, creating more sustainable socio-economic conditions in the community.

5.2.3 Changing Roles of Plantations

One of the factors that exacerbate the uncertain future in many plantations is the lack of alternative livelihood sources. In Mineral Spring, which has been transformed into a revenue village, people have ownership of the land. They use the land for subsistence farming or growing varieties of cash crops, besides increasing the production of tea that has existed for years. They also get some work in road constructions in the region. Hence, they have a number of options for their livelihood.

On the other hand, the people of Singell Tea Estate do not own any land, except for their houses and a meagre plot of land for a kitchen garden. As a result, they are unable to generate any income other than the wages their plantation work brings. It is said that under British administration, “there was no communication between the outside country and the barbed wires of the tea gardens, and a competitive, efficiency based economy didn’t emerge, the tea gardens

remaining as ‘enclaves’ of lopsided prosperity” (Roy, 1965, p. 238). But today, with the flourishing tourism industry in the Darjeeling Hills, many people are getting employment in different capacities. The problem though is that, this is happening in only some selected urban centres, such as Darjeeling, Ghoom and Mirik. Kurseong Town is the nearest urban centre, but it has yet to grow into a tourist spot or business centre. Moreover, the people from different places/plantations, including from the plains of West Bengal, and some new illegal immigrant of Nepal or Bangladesh, are already creating scarcity of unskilled work in the region.

It is a well-known fact that the tea plantations of the Darjeeling Hills have rendered invaluable contribution to the development of the regions. Even three decades ago in 1970s and 1980s, about 70% of the population depended on the tea industry. But, ever since, the pivotal role of tea plantations already started witnessing changes. Analyzing the situation in Singell Tea Estate, about 30% of the households residing in Upper Division, were dependent on other sources for their livelihoods. This trend can be seen even in Ambootiah, the adjacent plantation where this researcher briefly visited. Thus, one can see that job restriction in the plantation and increasing number of people is not only increasing the unemployment problem but also uncertain future in plantations. What is clear is that the tea plantations can no longer sustain the socio-economic conditions of the community. People need alternative jobs or other livelihood options to sustain their socio-economic conditions as it is found in Mineral Spring.

5.3 Institutional responses

5.3.1 Work of Local NGOs

In today’s world, non-government organizations are playing significant role in the transformation of society. In the Darjeeling Hill, too, in the last two decades a network of NGOs has been

established that are engaged in different fields, such as, social development, conservation of ecology, upliftment of the weak/marginalized. But, ironically, none of the NGOs is directly involved in working with the plantation workers to try to alleviate their problems. Of course, one of the main reasons is that, the tea planters of the yore had built a protective wall around the plantations, making them “islands” inaccessible for external agencies. Traditionally, the tea industry jealously guarded its system, keeping outside agencies out of any problems or trouble facing the plantation community. Even to this day, non-governmental organizations, mostly affiliated with human rights, have no easy access to the suffering plantation workers. Hence, it is not surprising that NGOs are conspicuous by their absence in Singell Tea Estate as they were in Mineral Spring Tea Estate when it was closed. In the latter case, there was no presence of any NGO for nearly two decades (1953-72) when the problem of plantation workers was beginning and later when they faced an acute socio-economic crisis. It was only in 1973 that an NGO--Hayden Hall Institute, affiliated to the Jesuit Religious Order--entered the area to alleviate people's suffering. Its main work was social development programmes—restoring people's dignity through economic improvements. This NGO had set up a dairy union for the collective sale of milk from different households with an aim of generating a reasonable income for the cash-starved community. Besides this, a mother-child care scheme, paramedics, and housing units were established. After more than a decade's work, this first NGO withdrew in 1987 under some ‘controversial’ circumstances. Later agencies have evaluated and analyzed the work of Hayden Hall. According to the evaluation, a centralized set up, high subsidies without accountability from the people, and lack of people's participation in planning, monitoring, and decision-making, were some of the factors leading to the ‘failure’ of the mission (RCDC, 1996).

But even to this day, many elders/seniors of the place feel grateful to Hayden Hall for caring for them, particularly, the mothers and children, the most vulnerable group of the suffering community in the worst crises of their lives. According to the Jesuit director, Fr. Edgar Burns, Hayden Hall Institute: "It happened many years ago so I have forgotten many things. But one thing I can say we did not withdraw abruptly or under some controversy. After more than a decade's presence we decided that we should let the community leaders to carry on the works initiated by the Hayden Hall." He, however, admitted that perhaps they had failed to prepare/train a core group of efficient community leaders who could carry forward the daunting task. But, to be fair, it must be acknowledged, that unlike today, this NGO was handicapped by lack of vehicular roads to reach different part of the plantation, spread out in three divisions. That had certainly hampered their coordination of works, training of local personnel and above all the effectiveness of the mission.

After a gap of about twelve year, in 1997, another NGO, PRERNA (formerly RCDC), took over the work with the community of Mineral Spring after some years of studying the situation. It has involved itself in different actions, such as co-operatives and credit unions. However, it is its work with the tea cultivators' co-operative that is most commendable. Before its entry, people of the place were still persisting with the dairy union but it was functioning without much success due to many households pulling out of membership. They were also engaged in subsistence farming and selling of 'hand-made tea' without any change in their socio-economic conditions. After their arrival in the place, members of PRERNA were instrumental in the creation of SVC-People's Committee. This NGO has been the catalyst in actualizing this new 'community-based management' endeavour by creating the 'first tea farmer's initiative' in the region. It has been an

effective link between the small tea farmers and the TPI, Pvt., Ltd., that markets the tea products of the former. But, most importantly, this NGO has constituted a core group of executives to manage their resources. When the question was posed to the interviewees in Mineral Spring, “What do you think is the most significant event that brought about changes in the socio-economic condition of the community?” many, if not majority replied, “the coming of RCDC or PRERNA”. After nearly a decade of existence in the place, PRERNA has been able to transform (to some extent) the erstwhile plantation community into small tea farmers/cultivators’ plantation, who can boast of sustaining their own livelihoods with the sale of organic tea leaves along with generating income from other sources. But today one moot question is being asked—will PRERNA remain in Mineral Spring indefinitely, or withdraw at some point of time? In nearly one-decade presence in the region, has this NGO prepared the people to take up the task of sustaining the ‘*Sunjukta Vikas Cooperative*’ (SVC) without its presence? Of the forty people of different age groups interviewed, about half of them said that the community can sustain itself ‘fully’ or ‘to some extent’ without the presence of any NGO. Interestingly, though, the response changed when more pointed question was asked: Can the community manage the marketing of tea leaves if PRERNA personnel withdraw? In response to this query, most respondents said that they want the NGO to continue, as the people are not yet ready to take over. On the other hand, a small group of educated individuals either associated with the SVC in some capacity or holding some position in the village ‘social organization’, were quite confident of managing the task after the departure of the NGO.

5.3.2 Role of Community-Based Management

A conventional plantations like Singell Tea Estate which is the epitome of centralized institution management is yet to devolve the management power to the plantation workers; the management is yet to bring in any democratic systems for participation of lower-rung workers in the planning or decision-making process. Hence, under the current top-down management system, community based management system cannot be created in Singell Tea Estate. To add to the complexity, the plantation community has no legal ownership right over tea plants or any other resources within their plantation. So, even if their community-based management organization were to exist, whose resources would the community manage, as plantation workers themselves have no ownership right?

On the other hand, *Sunjukta Vikas Cooperative* (SVC) has been functioning as a kind of community-based management organization in Mineral Spring. It can be termed 'a kind of community-based management organization, because SVC is still in infancy stage. Although, nearly all the households are members of this organization, the management authority of SVC is limited elected executives. At present this organization is committed to collecting organic tea leaves (produced by households) and marketing them through another tea estate. It has done enough to make tea farming one of the chief income sources for many households that can supplement their earnings from tea products with other sources. In order to expand its influence, SVC personnel have also created '*Naari Sangathan*' (women's organization), a women's wing of the organization whose active membership is growing every year. Women members receive a loan from the Central Bank of India, facilitated by PRERNA personnel; this loan is utilized in increasing their income/profit from the field.

But, SVC organization is still not independent; it takes constant help of PRERNA personnel and guidance from some experts in organic tea farming. Furthermore, marketing of cash crops or milk products are done independently by households or village middlemen. Not only that, felling or planting of trees/shrubs is still the prerogative of individual or households– SVC has no influence or control over their actions.

Hence, in order to exercise a larger impact over community as the premier organization, SVC needs to expand her influence and more viable to the community. The organization also needs to actively involve all the households in its work, who, despite being members of this organization, have been reluctant participants in any programme. Finally, this organization needs to instill in the people a sense of collective responsibility for the management of all other community resources, such as, trees, vegetation, wastelands, land, and water. Above all, it needs to present the roles and endeavour of the SVC as encompassing all the community resources for the socio-economic sustainability of community and ecology of the place.

5.3.3 Steps by Plantation Management

The biggest achievement of the present management in Singell Tea Estate, under Tea Promoters, India Ltd., (TPI) has been the absence of any crisis since taking over in 1999. In the somewhat fickle tea industry of Northeast India, this is a remarkable achievement. This has definitely enabled the relatively sustainable socio-economic status of the community in Singell Tea Estate, though, of the 40 workers interviewed, only 15% claimed their economic condition had improved under the current management. On the contrary, a general survey indicated that much larger number believe that their economic status has become more stable as a result of regular

payments and other benefits by the present management. As Ruben (65 yrs), a worker who has worked under three different managements, noted, “the best thing that has happened under this management is that our wages, rations and bonuses are given on time. Under all previous managements, we suffered due to irregularity of payments and other benefits.” This response was in contrast to two adjacent plantations, Ambootiah and Balason, where this researcher met some workers but received negative feedback about their present economic conditions under their current managements.

One significant aspect of this management in Singell is their new initiatives and some long-term steps taken for the sustainable use of the land and healthy geo-ecological sustenance of its surroundings. The following are some of the steps taken in this place, making it a unique plantation in the entire Darjeeling Hills:

- a) *Providing each household with LPG (Liquid Petroleum Gas) cylinder for cooking:* This is done with an aim to discourage use of firewood from the remaining forest.
- b) *Imposing a penalty on cutting of trees:* The violators are suspended from their work for a month and during that suspension period, they are required to plant about 300 trees or tea plants.
- c) *Planting of new and replanting of old tea bushes:* It has been the new mission of the management to replace old tea bushes with nursery tea plants and use the land in a more sustainable manner.
- d) *Creation of a ‘welfare committee’:* This operates on a voluntary basis where the workers are encouraged to plant trees, clean places, making drainages while the management provides meals and snacks.

e) *Use of organic manure instead of chemical fertilizers*: By replacing chemical fertilizer with organic manure like dung, it is ready to forfeit short-term profit in order to obtain long-term profits through more sustainable use of the land. In order to achieve this, green grasses, such as, *Gote mala* have been planted amidst tea bushes all over the plantation. The management has also started giving loans to people for buying dairy cows. This will have multiple benefits: households will get income from the sale of milk and cow dung, while the management will get dung from these households for use as manure in the tea plantation fields.

F) *Use of 'Vermi compost'*: An organic manure-making process, introduced by a German soil scientist in this plantation 4-5 years ago will enhance organic tea cultivation. It is prepared by digging a large pit about 3 ft. deep, about 7 ft. wide and 15 ft. long. It is then filled with cow dung and green grass, and watered. After a few days of fermentation, it provides a perfect atmosphere for the birth of earthworms, which in turn help in the decomposition of these mixed matters. While the vermi compost makes excellent manure for the plants, the liquid collected from the process becomes pest control medicine (an effective substitute for pesticide), without having any negative side effect on the tea plants or soil. Thus, this current management has taken some environmentally friendly steps that will help the sustainable use of the land and also will protect the degradation of the local ecology.

5.3.4 Community Action Groups

It has been mentioned that in each hamlet or 'labour colony', there are some 'Samaj' (village social organizations) for carrying out social responsibilities in the community. But their work is limited to performing social activities with occasional economic help to very poor households. But, in recent years, under the initiatives of the younger generation, some other groups have been

formed. In some hamlets of Mineral Spring, 'self-help group' has been formed and as the name denotes, it is for doing something concretely by individuals with the help of the group. This particular group mobilizes the group members to obtain loans from the government in order to begin some business enterprises. This is aimed at improving the economic conditions of individuals, households and even the community.

In Singell, some other type of group has emerged—for creating environmental awareness. Action Groups, such as the 'welfare committee' and the 'self-help group' are to some extent for the economic betterment of the community but mainly they are for conscientizing the plantation workers of the need to conserve forests, mountain streams, and other natural resources for future generations and for the healthy environment of the place. Interestingly, though, Action Groups in Mineral Spring emphasize the socio-economic aspects while leaving the environmental issue to the household level. On the other hand, the Action Groups in Singell emphasize environmental aspects while leaving the socio-economic concerns to the household. So there needs to be emphasis on both aspects—sustainable socio-economic improvement as well as sustainable ecological balance.

5.3.5 Role of Local Administration

As it was mentioned earlier, as long as the tea estates fell under the purview of the Plantation Labour Act (1951), neither government nor any non-government agencies could start any kind of welfare scheme (as was evident from the case in Mineral Spring). The situation still persists; the people of the plantation as non-revenue villages' do not enjoy many privileges enjoyed by traditional 'revenue villages'. Hence, tea plantations remain as "isolated island" where local

administration has no roles to play. Even though, after the introduction of '*Panchayat Raj*' from 1985, the plantation workers have been enrolled in the voters list, the *panchayat* welfare programmes seldom reach plantation workers. The coming of DGHC (The Darjeeling Gorkha Hill Council) has for the first time forced its presence in the tea estates of the Darjeeling Hills. Consequently, for the first time after the establishment of tea plantations, concrete roads are being built through the plantation land by even uprooting hundreds of tea bushes. And so, people are very happy with DGHC. As one key informant remarked, "The DGHC personnel are involved in lot of corruption. But, most people living in remote tea estates are extremely happy with them, because only after the creation of DGHC in 1993, road constructions and other developments are taking places in their tea estates. And they feel so happy that finally they would get vehicles to go to some urban centres instead of walking for hours".

Mineral Spring, being a rather remote place despite linked by roads, has not really witnessed any activities initiated by local administrators. Even here majority of people said they were very happy with the DGHC in spite of their slipshod ways of working in the area. The Forest Department also has alienated itself from the people by prohibiting their entry into forest area, instead of enlisting the community as participants in the stewardship of the forest resources. Thus, the roles and actions of the local administration leave a lot to be desired.

5.4 Summary of Key Findings

1. The clearing of forests before tea cultivation was the predominant process in causing early landsliding and erosion. In the immediate post-Independence era, considerable tree felling by people and managements caused further deforestation. The result was increased landslides/soil erosion, loss of biodiversity and wildlife, and drying up of natural springs.

2. In recent years, both study areas have witnessed negligible deforestation: Mineral Spring, due to the Forest Department's sanctions against tree felling and their own afforestation; Singell T.E., due to introduction of LPG for cooking as an alternative fuel and similar sanctions on tree-felling and encouragement of good drainage.
3. In both areas the impacts of landslides and soil erosion have been reduced due to changed land use patterns: afforestation, terraced agriculture and re-plantation of tea. However, in both places, recent road construction has led to a corresponding increase, at least temporarily, in landsliding and soil erosion.
4. Tea plantations are failing to provide sustainable livelihoods to the communities due to increasing population, rising production costs and various crises. This has forced people to seek livelihood opportunities outside the plantations and villages.
5. However, a current plantation crisis that is forcing indefinite lockouts of different plantations in the district is creating uncertain future for many households with no other employment than plantation work.
6. Traditional tea plantations alone are unable to provide social and economic sustainability to growing plantation community. Diversified livelihood sources as at Mineral Spring offer the alternatives through management of one's own resources. However, this requires land ownership and other resources, which is the most essential component of this transition.
7. Different institutional strategies have been used in the study areas to deal with geo-ecological and socio-economic problems. In Singell Tea Estate, the strategies are directed at improving local ecology through sustainable land use and reforestation/ re-plantation measures; in Mineral Spring, the strategies are directed at diversifying community livelihoods and also using tree products from private-owned fields.

Chapter 6: Conclusions and Implications for the Future

The primary purpose of this study was to describe and explain the impact of tea plantations on the geo-ecological aspects and community-level socio-economic conditions in the Darjeeling District, India. Four objectives were set to attain the research purpose. This chapter refers back to each of the initial four objectives of the research, and discusses the major findings with regard to objectives set, in the light of the literature review of chapter 2. Then, the implication of the key findings of the study for the future, are discussed. Finally some realistic recommendations for future actions are presented.

6.1 Conclusion

6.1a Evolution of the Tea Plantations

The first objective was to obtain data descriptive of the evolution of tea plantations in the Darjeeling District since India's independence (1947). Research showed that the main factors for the onset and rapid expansion of tea plantations in the Darjeeling District in mid-19th Century were the availability of land, cheap labour (mainly from Nepal), revenue-tax exemption, and the status of the Darjeeling District as outside the land regulations of Bengal. Rapid expansion of tea plantations in the second half of the 19th Century created major employment opportunities and served as the impetus for initial economic development of the region. In the post-Independent era, tea plantations in Darjeeling suffered a decline in quality and quantity due to aging of tea bushes, land degradation due to cultivation without fallow and use of chemical fertilizer. Also, after 1947 the tea industry started showing signs of gradual decline as a result of changing social, economic and political realities.

In 1951, the promulgation of the Plantation Labour Act, for the first time, improved the socio-economic conditions of plantation workers. The entry of trade unions soon after India's Independence safeguarded workers' interests but often led to conflict with management, resulting in labour problems, strikes and retaliation by management and tea estate owners in the form of lockouts. These conflicts worsened the financial viability of tea estates---many plantations were declared "sick" and others closed. The end result was a series of crises in the tea growing business, leading to instability in the local tea economy, and increased socio-economic difficulties for plantation workers. The findings generally show labour problems, decline in tea production, and increased financial crises in the tea plantations, following the change from British to Indian ownership. The new and generally untrained Indian owners/administration faced all these crises without taking measures to replant aging tea bushes, which had been neglected in the last years of British ownership. It is unfortunate that their management strategies were for the most part based on turning a quick profit from tea.

Both case study areas, Mineral Spring and Singell Tea Estate, experienced these difficulties. Mineral Spring Plantation faced its first acute financial crisis soon after India's Independence. In the late 1950's the tea estate was closed completely, leaving the plantation community to face extreme socio-economic problems for more than a decade before the first NGO (the Hayden Hall Institute) intervened on its behalf in 1973. Singell Plantation also experienced labour problems and financial crises within a decade of ownership transfer from the British. After first being declared a "sick tea garden", it was closed temporarily in 1969. Here too, the plantation workers suffered economic problems without the benefit of intervention by any NGO. In both cases,

plantation closures compelled the community to seek their livelihood through other tactics; including the felling and selling of trees.

6.1b Geo-ecological impact

The second objective, to describe and explain the geo-ecological impacts (landslide and soil-erosion) arising from development and evolution of tea plantations, involved a study of the problems of deforestation, caused by the initial clearing of trees for tea cultivation by the British as well as the effects of second phase of deforestation in the post-independence period due to tree felling by tea garden managements as well as the plantation worker communities. In addressing the second objective, the research examined the effects of deforestation in Mineral Spring and Singell.

Deforestation

Both study areas witnessed serious deforestation after the temporary or complete closure of the tea estates. Of course, they had experienced deforestation in the nineteenth century when many trees were cleared to begin tea cultivation. This earlier deforestation resulted in the loss of biodiversity, wildlife, a gradual drying up of springs/channels and problems of landsliding in some areas. Articles by Ives & Messerli (1989), Sarkar & Lama (1986), Colby (1991), Schickhoff (1995), Tiwari (2000) and others present evidence of problems caused by deforestation in the form of loss of biodiversity, wildlife, declining of water table and problems of landslides/soil-erosion in the Himalaya. This early deforestation represents one form of degradation. Schickhoff (1995), Pant & Khaduri (1998), Tiwari (2000), Nusser (2000), Gardner (2003) and Kaniyal (2003), among others, provide evidence of another form of environmental damage. Competition

for food, fuel and other resources intensifies due to rapid population growth, often causing humans to turn to destructive practices. In the case of tea plantations, the forests were replaced by tea bushes, which, at least, have some degree of soil stabilizing influence.

In both of the cases under study, the closure of plantations prompted the out-of-work labourers to engaged in the large-scale felling of trees on the tea-estate leased forestlands. In fact, in the absence of any viable livelihoods, the destruction of trees continued for almost a decade causing a substantial depletion of forest resources in the area. In Mineral Spring the uprooting of tea bushes followed tree felling and the cleared fields were converted for various land uses (Rai & Sarkar, 1986); which did not happen in Singell Tea Estate but it did lead to large-scale tree cutting for a short time span. In all of this, however, one fact needs to be kept in mind; the acute social and economic crises of the time compelled the people to destroy trees and tea bushes in the absence of any other viable livelihood source. According to a few writers (Adam, 1990; Duraiappah, 1996) socio-economic crises are important among the factors that lead humans to indulge in deleterious activities, including destruction of tree cover. From a comparison of the study findings and the reviewed literature, one can rather safely conclude that, although there was extensive deforestation during the creation of tea plantations, the negative environmental effects were buffered by tea bushes. Subsequent episodes of deforestation followed the closure of tea estates.

Landslides

It is a known fact that the Himalayan region is quite susceptible to landslip processes. Many researchers have demonstrated that, due to steep slope and large-scale deforestation in the past, many small and large landslides, mudslides, rock fall, and soil erosion occur throughout the

Himalaya (Sarkar & Lama, 1986; Ives & Messerli, 1989; Pant & Khanduri, 1998). Today, landslides and soil erosion in both study areas are reduced because of the presence of dense tree cover, proper terrace agricultural practices, (as seen in Mineral Spring) and a proper drainage system (as seen in Singell).

Notwithstanding these improvements, recent road constructions linked to the development in both cases have caused landslides and soil erosion. Actually, from the onset of the tea industry in Darjeeling, road construction on tea estates caused landslides and soil erosion problems due to the removal of soil, rock, and uprooting of vegetation (Roy, 1965; Choudhari, 1978). Similar research conducted in the mountain areas of North Bengal reported increased landslides due to road construction in hill areas, in addition to their occurrence along existing roads during heavy rains (Lama & Sarkar, 1986; Starkel & Basu, 2000). Yet, people overlook the fact that the development of a hill area comes at the expense of landslides and soil erosion and subsequent land degradation (Heimsath, 2000). In the two communities under study, as in any remote area throughout the world, the people argue in favour of roads since they usher in economic developments. Therefore, people need to remember that road construction, although providing a measure of development, involves activities that often leads to the destabilization of hill slopes which, in turn, causes denudation of the area through soil-erosion and landslides (Lama & Sarkar, 1986). With regard to landslides, it can be said that the Darjeeling area has been subject to widespread destructive landslides at certain periods during the past 150 years (Choudary, 1978; Lama & Sarkar, 1986). But with respect to the two cases studied, the impacts have been, and continue to be, limited. Tea bushes have played a significant part in minimizing their impact. On the other hand, road constructions and other developments have either initiated landslides and soil-erosion or have aggravated geo-ecological problems.

6.1c Livelihood situations

The third objective involved a description, evaluation and explanation of the impact of tea plantations on the social and economic situation of their communities. A key conclusion of this study is that tea plantations are unable to provide sustainable livelihoods to plantation communities in the same ways as they once did.

Generally, the main livelihood source of the people in the Himalaya is obtained from land and forest (Sinclair & Ham, 2000; Tiwari, 1984; Rawat, 1995) while livestock also constitute important livelihood sources for some communities (Ives & Messerli, 1989; Kaniyal, 2003). By contrast, the majority of households in the Darjeeling Hills depend on tea plantations, which in recent decades has often challenged their livelihood security. However, the case studies show that a growing number of former tea plantation people are seeking employment elsewhere or finding alternative livelihoods due to temporary or permanent closure of some tea estates and the growing population. Without land ownership rights, plantation workers are left with few options to improve their socio-economic conditions, in spite of an increase in wages in the case of Singell Tea Estate. By contrast, Mineral Spring has been able to sustain its socio-economic conditions much better than Singell due to a diversification of livelihood sources---including organic tea, as a result, in part, of land ownership. The article by Gardner *et al.*, (2002) dealing with the enhanced livelihood options in the hills, notes that in Western India, the growth of the tourism industry has brought increased employment and enhanced the local economy through a blossoming of the hotel and transport industries. Just in the last decade, the growth of tourism in the Darjeeling District has provided both skilled and unskilled jobs to a growing number of

unemployed people in the area, besides creating ancillary jobs in hotels, tourist travel, trekking, transport and other areas.

The increasing socio-economic problems in the tea plantations of the Darjeeling Hills in recent years, suggest that perhaps there is a need to adopt alternative systems for the management of the various natural and human resources in the region. Changes could begin by facilitating management of local resources by the local community, as has been demonstrated in Mineral Spring. This, in turn, should lead to stewardship of 'commons' like, local forest and land by the local community, as traditionally practiced by the 'Pahari' community of western India (Berkes *et al.*, 1998). Another significant finding of this study is that, in both Mineral Spring and Singell, the sanction against tree felling led the communities to plant more trees so as not to use forest for their needs. This is in sharp contrast to the behaviour of the local residents of Kullu Valley, who, after having been alienated from the forest by government sanctions, expressed their resentment by engaged in illegal cutting of forests (Berkes *et al.*, 1998).

Finally, as a researcher, I would say that conducting a study of the geo-ecological impacts in a region in the midst of socio-economic crises was quite challenging. Although the fact that I was somewhat familiar with the place had some advantages, the time limit set for the study made me feel ill equipped to take on a topic that addressed the environmental and social economic aspects of two large and complex communities. Yet, through carrying out this research I learned a great deal about techniques for collecting data and tools for later analyzing them.

6.2 Implications for the future

Objective four aimed to identify and propose some strategies that would assist the sustainability of the local communities and the sustainable use of land cover in the future. The case studies showed that both communities have developed some effective strategies to address geo-ecological and socio-economic problems (each community giving higher priority to their respective greatest needs).

The findings and conclusions of the study offer suggestions that would enhance the environmental and livelihood sustainability in the Darjeeling District. These findings imply a need for livelihood alternatives in order to sustain and improve the socio-economic conditions of the growing population of tea plantation communities in the Darjeeling Hills. This is a great need at the moment, as failure to create more and diverse livelihood opportunities in plantations can lead the people to once again destroy forest and other natural resources available in their vicinity. Therefore, the major challenge is to create a sustainable ecology and at the same time sustainably develop the economic conditions for the communities that depend on the tea plantations. In other words, the challenge for the future is how to meet the basic needs of the community without simultaneously depleting the natural resources such as, land, water, forest and so on (Berkes *et al*, 1998). The next section, offers concrete recommendations about how to meet this dual challenge.

6.3 Recommendations

At the end of this study of two types of land use areas, Mineral Spring and Singell Tea Estate, I would like to recommend certain steps/measures for further consideration.

Community- based sustainable development

Development in a sustainable manner may be enhanced when the local community is fully involved in the endeavour. In order to achieve this objective, the community needs the ability to participate actively in its own development and that of the region, by proposing initiatives that will enable it to improve and sustain livelihoods without degrading the resources on which it depend. Land ownership, as at Mineral Spring or participatory management at Singell are positive factors in this regard and should be encouraged.

Change in top-down management system

The management of a conventional tea plantation like Singell needs to involve the workers' community in some levels management. Through participatory management processes, the Singell management is working with Peoples' Action Group, on the reforestation of the place. By allowing the nurturing of tea bushes (under certain plots of land) to a group or hamlet and sharing some percentage of profit from the same will bring in the change in the system, besides some degree of ownership property rights.

Introduction of poly crops (i.e. cash and subsistence crops) in tea plantations:

The dependence of people for livelihoods on just mono crops such as tea makes the plantation community socio-economically vulnerable. Hence, poly crops should be gradually introduced in

tea plantations as in Mineral Spring. Introduction of orchard crops like oranges, peaches, pears and some cash crops amidst tea bushes will have multiple benefits. They can offer employment for the growing population besides diversifying livelihood options. Moreover, the introduction of poly culture crops in the existing tea plantations will increase biodiversity, which is good but can lead erosion, landslides and fertility degradation without proper care. Therefore, before introducing this agenda guidance of some experts should be taken in land use planning; it will provide proper cultivation strategy and also prevent soil erosion and degradation.

Combined involvement of NGOs/Govt Agencies:

One of the reasons for the absence of NGOs and government agencies in the tea plantations is the lack of combined efforts by these two agencies to address the problem of the plantation community. More combined and active involvement in the issues of tea plantation and their workers will help them to understand the plantation problems better and ensure the initiation of some effective measures for improving the livelihoods of plantation workers and their families. The combined force of these two agencies could also be geared toward sustaining the ecology of the land besides enhancing the socio-economic conditions of the people. In order to achieve this, different governmental agencies responsible for various departments such as, forestry, land, water and human resources should actively collaborate with NGOs engaged in similar kind of work. The government agencies, such as, the Forest Department and the Land Reform Department, need to take account of the crucial linkage between land-use in the region and its any negative environmental impacts in the forms of soil erosion and landslides. In this endeavour they can be more effective if they collaborate with some environmentally conscious agencies. Thus, the formation of an effective combination of non-government and government agencies

can provide environmentally sound and socio-economically sustainable development guidelines and regulations for the region.

Integrated Institutional approaches

At Mineral Spring and Singell Tea Estate different groups are separately engaged (with limited success) in working at the societal, economic, or environmental levels. There is a need for an integrated approach to adequately address the local/regional socio-economic and geo-ecological issues. Some NGOs need to coordinate the works of different households, communities, action groups, with those of other NGOs and government agencies to obtain desirable and effective results. In Mineral Spring, the NGO needs to coordinate works of SVC on tea farming, organic crop cultivation and tree planting at the household and community level with the protection of forests by the Forest Department. In Singell Tea Estate, the management needs to enhance workers' living standards while at the same time involving the people's 'welfare committee' and 'self-help group' in maintaining a healthy environment through re-plantation and other measures. Thus, by integrating the works of different institutions, a sustained growth of economy of the place, the well being of the society, and maintenance of ecology can be achieved.

Further Research

There were virtually no empirical studies in the Darjeeling area linking the studies on geo-ecological aspects of the place with that of the socio-economic conditions of the people in the tea plantations. This study has partially filled that gap. However, further research could help reaffirming the findings of this study or contradict it and help establishing new direction for environmental and livelihood sustainability. In other words, more research will help in better

analyzing the changing roles and sustainability of tea plantations in the Darjeeling area and perhaps, other parts of the world with similar conditions. Furthermore, complementing qualitative study with quantitative research will help in the accumulation of more baseline data on the geo-ecological and socio-economic conditions of the area. These accumulated data, might in turn, provide an important reference source for future studies and may be used by different agencies. More research will also further advance the understanding of the complex relationships between ecology, economics and society. In addition, use of GSI mapping and satellite photography will help in procuring more accurate images of forest covers and landslides and help different agencies in taking effective measures.

Hence, there is a case for research from a multidisciplinary perspective. Research from various disciplines (such as sociology, economics, geography, anthropology) will provide different perspectives on the problems of the area and supplement the already collected data.

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Appendix: A

Semi-structured Interview Schedule (Mineral Spring and Singell T.E.)

Name:-----Age:-----Gender:-----

Educational level: Place-----;

1. Introductory Questions:

- i) Are you a resident of this tea plantation?
- ii) What kind of work do you do?

2. Personal Information:

- i) How long have you lived in this plantation?
- ii) Have your parents/grandparents also lived here? Y N For how long? -----

3. Demographics:

- i) How many people live in this household?
- ii) Do you identify with any ethnic group(s)/caste? Y N If so, which one(s)

4. Group membership/organization:

- i) Do you belong to any group(s)/organization(s)? Y N If yes, which one(s)-----
- ii) What are the roles/functions of these group(s)/organization if some problems arise in the community?
- iii) What are some benefits of being a member?
- iv) Who would you say are the “leaders” in your community and what are their roles (include yourself if appropriate)?

5. Economic status/livelihoods:

- i) What is the main source of your income?
- ii) What are the other sources of income/means of livelihoods?
- iii) Are the earnings enough to sustain your family? Y N, If not, why it is not enough?
- iv) Has there been any increase in your income in recent years? Y N, Why/why not?

- v) Does any member of your family work outside the place/plantation? Y N If yes why? What kind ?
- vi) Have you observed/experienced any economic changes in the community? Y N, If yes, what? Since when?
- vii) Which events in your memory “stands out” as having the most significant influence in bringing about these changes?

6. Community’s Environmental awareness:

- i) Are you aware of any present or past incidence of *pairos* (landslides/erosion) in your area? Y N -----
- ii) What type of landslides/erosion occurs in your area?
- iii) If yes, what are the causes for their occurrence? -----
- iv) Any measures initiated in your place prevent or control landslides/erosion?---
- v) Have you seen any forests/tree covers in your plantation or in its vicinity? Y N,
- vi) How was this forest cover about 15 to 20 years ago ?
- vii) What could be the reasons for changes in forest area/cover?
- viii) Do you think losing forest cover or having landslides is a problem? Y N, what way?

7. Dealing with crises situations:

(Rating scale: 4= very; 3= somewhat high; 2= little; 1= negligible)

- i) Using the rating scale, rate how much are you affected when plantations get closed down for more than a week during *bandh* (strikes). (Add your answer)
- | | | | |
|---|---|---|---|
| 4 | 3 | 2 | 1 |
|---|---|---|---|
- ii) Do you ever depend on the forests/land outside the plantation during strikes?
Y N If yes, what for?

8. Community Response:

- i) Did you ever want to leave the plantation? Y N Why?
- ii) Do you see your/your children's future in the plantation? Y N why, Why not?
- iii) Are you happy the way your tea plantation/place managed or governed? Y N , Why?
- iv) If not, is there any thing you want to see changed in the plantation?
- v) Is there anything being done at community/institutional level to improve socio-economic condition of the community?
- vi) What according to you should be done to change the socio-economic situation of your place?
- vii) Is there anything being done on the household/individual level to promote healthy ecology?
- viii) Is there anything being done at community/institutional level to promote the local environment?
- ix) Is there anything being done at household/community/institutional level to promote sustainable use of the land/forest cover?
- x) Is there anything being done at household/community/institutional level to strengthen sustainability of the community?

Appendix B.

/A/. Singell T.E.= 101; /B/. Mineral Spring (Dabaipani) = 201

1. **CatRes:**

Different categories of interviewees/ respondents.

- i) Seniors/retired worker =1
- ii) adult male = 2
- iii) adult female=3
- iv) youth (men/women) = 4
- v) key informant = 5

2. **Housloc:** (house location)

Q. where is your house located with respect to the respective study area?

- i) Near the stream= 1
- ii) near the slope= 2
- iii) near the forest= 3
- iv) in the flatter place = 4

3. **GpMem:** (Group Membership)

Q. Do you belong to any 'Samaj' (informal social organization)?

- i) Yes = 1
- ii) No= 0

4. **GpFun:** (Group function)

Q. what are the roles/functions of the village organization you belong to?

- i) Social responsibility= 1
- ii) Economic support= 2
- iii) Political=3
- iv) Environmental work = 4
- iv) others =5
- vi) Not sure=0

5. **WrkPos:** (work or profession)

Q. what is your primary work/profession for your livelihood?

- i) Tea worker = 1;
- ii) plantation clerical staff =2
- iii) government service =3
- iv) daily wage labourer = 4
- v) tea farmer=5
- vi) manager/administrator= 6

- vi) agriculturist =7
- vi) others= 8

6. **IncPr:** (Primary income source)

Q. What is the primary source of your income?

- i) tea work=1
- ii) tea sale=2
- iii) govt. service=3
- iv) daily labour=4
- v) cash crop=5
- vi) animal husbandry= 6
- vii) other source =7

7. **IncS1:** (secondary income source)

Q. what is the secondary source of livelihood that supplements your primary income? -

- Codes and variables, same as above.

8. **IncS2:** (tertiary income source)

Q. what are other secondary (tertiary) source(s) of livelihood to supplement your primary and first secondary sources of income?

-Codes and variables, same as above

9. **IncInr:** (increase in income)

Q. Has there been any increase in your individual/household income/earnings in recent years?

- i) Greatly= 1
- ii) slightly=2
- iii) no increase= 3
- iv) slightly decreased= 4
- v) decreased= 5

10. **MonInc:** (approximate monthly income)

Q. what is the approximate monthly income of your family?

- i) less than < Rs. 500 = 1
- ii) from Rs.500 -- 1000 =2
- iii) from Rs. 1050 -- 2500 =3
- iv) from Rs. 3000 --5000 =4
- v) above > Rs. 5000= 5

11. **ChanQh**: (change in household quality)

Q. Has the economic or living condition of your household gone any change over last 10 years?

- i) Better = 1
- ii) marginally better=2
- iii) no change at all=3
- iv) marginally worse= 4
- v) Worse= 5

12. **ChanQc**: (change in community condition)

Q. Have you observed any change in the living condition of your local community?

-Codes and Variables, same as the above

13. **ChanRsn**: (reasons for socio-economic changes)

Q. What according to you is/are the most significant event(s) that brought about these changes in socio-economic condition of the community?

- i) Road construction = 1
- ii) many income sources= 2
- iii) entry of NGOs= 3
- iv) increasing commodity prices= 4
- v) unemployment problems= 5
- vi) new mgmt/administration= 6
- vii) work outside plantation/village= 7

14. **EcoPro**: *Q. During which period people faced most acute socio-economic problems?*

- i) During garden closure=1
- ii) during Gorkha land movement=2
- iii) During *bandh* calls= 3
- iv) during 40 days strike= 4
- v) During any disaster (landslides) = 5

15. **EcoPr**: (present period of economic problems)

Q. When do people face most socio-economic problems in the present times?

- i) During closure of garden =1
- ii) during *bandh* (strikes) =2
- iii) During off seasons =3
- iv) Other reason =4
- v) Never =5
- vi) can't say = 6

16. **FrsCvP**: (past forest cover)

Q. Was there any forest/tree cover in your place or in its vicinity about 15-25 yrs ago?

- i) Very dense= 1
- ii) fairly dense= 2
- iii) sparse= 3
- iv) no forest= 4
- v) don't know=0

17. **FrsCvPR**: (current forest cover)

Q. Have you seen forest/ trees cover in recent years?

--Code and variables same as above.

18. **DfrRsn**: (causes for deforestation)

Q. What do you think were the reasons for changes in forest / trees cover in or around the plantation/villages?

- i) House making/repairing = 1
- ii) fuel wood= 2
- iii) wood selling for livelihood= 3
- iv) Road construction = 4
- v) all the above= 5
- vi) frustration= 6
- vii) financial crisis= 7

19. **DfrTm**: (time of deforestation)

Q. During which period the maximum trees or forest cover got depleted?

- i) In recent years= 1
- ii) Gorkha land movement = 2
- iii) Garden closure days= 3
- iv) In the distant past= 4
- v) During some particular management period =5

20. **Ls**: (Landslides)

Q. Have you observed any landslide/soil-erosion in your area/place?

Yes = 1
No =0

21. **LsRsn**: (causes of landslides)

Q. What according are the causes for the occurrence of landslides in your region place?

- i) Lack of trees= 1
- ii) less number of large trees=2

- iii) heavy rain= 3
- iv) no drainages = 4
- v) Road constructions/developmental activities=5
- vi) All the above= 6
- vii) don't know= 0

22. **LsFrq:** (frequency of landslides occurrence)

Q. How frequently the landslide/soil erosion occur in your areas?

- i) Never = 0
- ii) occasionally = 1
- iii) often sometimes = 2
- iv) often =3
- v) very often (every year) = 4;

23. **LsSiz:** (size of landslides)

Q. Normally how large is the landslide/soil erosion occurring in your region?

- i) Negligible = 1
- ii) very small = 2
- iii) small= 3
- iv) fairly large= 4
- v) very large = 5

24. **LsCntr:**(landslides control measures)

Q. What measures should be taken to prevent and control landslide/soil erosion from occurring?

- i) Retaining wall= 1
- ii) tree planting= 2
- iii) leaving the place undisturbed = 3
- iv) drainages=4
- v) all the above= 5
- vi) don't know= 0

25. **LsRsC:** (response to landslides at community level)

Q. Has there been any measure taken by the community or institution(s) to deal with landslide problem?

- i) Very good= 1
- ii) good= 2
- iii) indifferent= 3
- iv) bad= 4
- v) very bad=5
- vi) not sure= 0

26. **EnvProt** (environmental protection measures)

Q. Is there any measure in the place to control use of firewood from forests for cooking?

- i) Supply of cooking gas =1
- ii) Supply of fuel from outside =2
- iii) penalty for tree cutting =3
- iv) Environment awareness programmes =4
- v) No action = 5
- vi) Don't know = 0

27. **EnvPh:** (environmental promotion at household level)

Q. What are the household measures to promote healthy ecology in their place?

- i) Tree Planting =1
- ii) Organic cultivation =2
- iii) No measures =3
- vi) Not sure =4

28. **EnvPc:** (Environmental promotion at community level)

Q. What are the community/institutional measures to promote healthy ecology in their place?

- i) Tree Planting =1
- ii) Organic cultivation =2
- iii) Making drainages =3
- iv) Use of LPG gas = 4
- v) all the above =5
- iv) Some of the above =6
- v) None of the above =7

29. **Sustain:** (community sustainability under changing system)

Q. Will the community be able to sustain its main sources of income if the present system of management fails?

- i) Yes =1
- ii) to some extent =2
- ii) No (can't sustain) = 3
- ii) don't know = 4
- iv) not sure =5