

CHAPTER I

INTRODUCTION

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1.0 Introduction

In the Indian context tea industry is one of the oldest labour-intensive industries. Sub Himalayan belt is the most dominating tea-producing area of the country. Among these areas, Darjeeling District is the most remarkable one. In Darjeeling District, the first tea factory was established by the Britishers in the year 1859. (Syamroy, 1985) Since then, the Darjeeling tea industry has had a prolonged glorious historical background and is renowned for its excellence worldwide.

The tea industry is primarily women labour intensive. Most workers in Darjeeling tea estates are women, and they play significant roles, from plucking tea leaves to processing tea in the factory. However, in the post-colonial period, the tea industry was passing through various crisis which influenced the life and working potential of the women workers. Women workers are responsible for improving the tea gardens and playing double role in the plantation and household. So, the betterment of the women workers from the management can enhance the overall livelihood of the gardens. With better livelihood and living conditions, women workers positively affect the conditions of tea gardens in the Darjeeling District. Women workers are ignorant and deprived part of the tea plantation. However, women workers play a positive gesture in those gardens where facilities are adequate. It is observed that those tea gardens are performing well with time and provide good livelihood and facilities like education, health, sanitation, and hygiene to their women workers. Women workers are more liable and attentive to their work. They always show a positive gesture to improve the condition of gardens as well as the level of production. So, women workers with good health conditions and educational levels can play a significant role in garden society and industry. Because still now, women workers are confined to plucking work in tea gardens, but with time, they can play an important role in garden factories and offices. So, there is a scope for the upgradation of women workers in the tea industry.

The socio-economic conditions of tea plantation women workers need to improve in the Darjeeling District due to the low income. The plantation labour act secures some of the facilities for women workers in the plantation industry. Most of the time, lack of information education is not provided to the women workers, or women workers are not

asking for their rights. (Bhadra, 1992) Better livelihood can enhance the lives of women workers in Darjeeling tea gardens. So, it is a cyclic order that with the facilities, women workers are getting good livelihoods, enhancing their working environment. With enhanced production, one garden can provide good facilities to its women workers.

1.1 Statement of the problem

The Darjeeling district is renowned for its world-class tea. This famous beverage had its physical as well as socio-economic and cultural significance. Garden society has its typical nomenclature concerning the other society. In this way, two demarked socio-cultural outlooks took place within the same space. In the Darjeeling District, various tea gardens perform their day-to-day livelihood practices depending upon the tea garden. The history of the garden of the Darjeeling district is divided into two major groups. One is the Terai region, and another is the Hill area of the district.

1. Daily wages are meagre, which directly affects the livelihood of the gardeners.
2. The living conditions that garden authority provides need to be better.
3. The health conditions of women workers are deplorable, especially reproductive health, nutritional health is in crisis.
4. The working capacity of the women workers is at most the optimum level by the garden authority, but facilities and bonus are not regularly distributed.
5. Many of the gardens need better doctor facilities. Dispensaries are there with local attended and local equipment; most gardens do not provide ambulance facilities thus health condition of the garden is at ultimate risk.
6. The nature of study work in the tea garden is collective work. So, the relationship between the owner and the worker should be optimum and smooth. However, sometimes, these equilibrium conditions are disrupted, and the running condition of the garden is hampered.
7. A Trade union is the fundamental operating unit among the garden authority and the labour but the various steps by a trade union face question.
8. Specifically for the women workers working conditions are not up to the mark because of lacking bathroom facilities, protective clothing, overburdening, and various other health issues.
9. Education in the study area is another big crisis. However, for high school and college, they have to go outside of the garden; in these regards, women workers

still need to get this facility as their male counterparts. So, education becomes a gender-related issue in the tea garden of the Darjeeling district.

1.2 Area of Study

Darjeeling Districts lie between 26°31' to 27°13'N latitude and 87°59' to 88°53' E longitude. The total area of the Darjeeling District is prominently divided into two major regions, the Hill area and the Terai plain. (Map- 1.1) This district is divided into four subdivisions; Darjeeling, Kurseong, and Mirik are situated in the Hill area and Siliguri is in the plain area. Due to the geomorphological consequences, the Kalimpong subdivision has no renowned tea gardens (O'Malley, 1999) and separated from Darjeeling District in the year 2017. So, our study regards tea gardens only confined within Siliguri, Kurseong, Mirik and Darjeeling subdivisions. (Map1.2) So, on and so forth, likely from Kurseong and Darjeeling tea gardens selected for the survey and selected for the detailed survey apart from the Terai gardens.

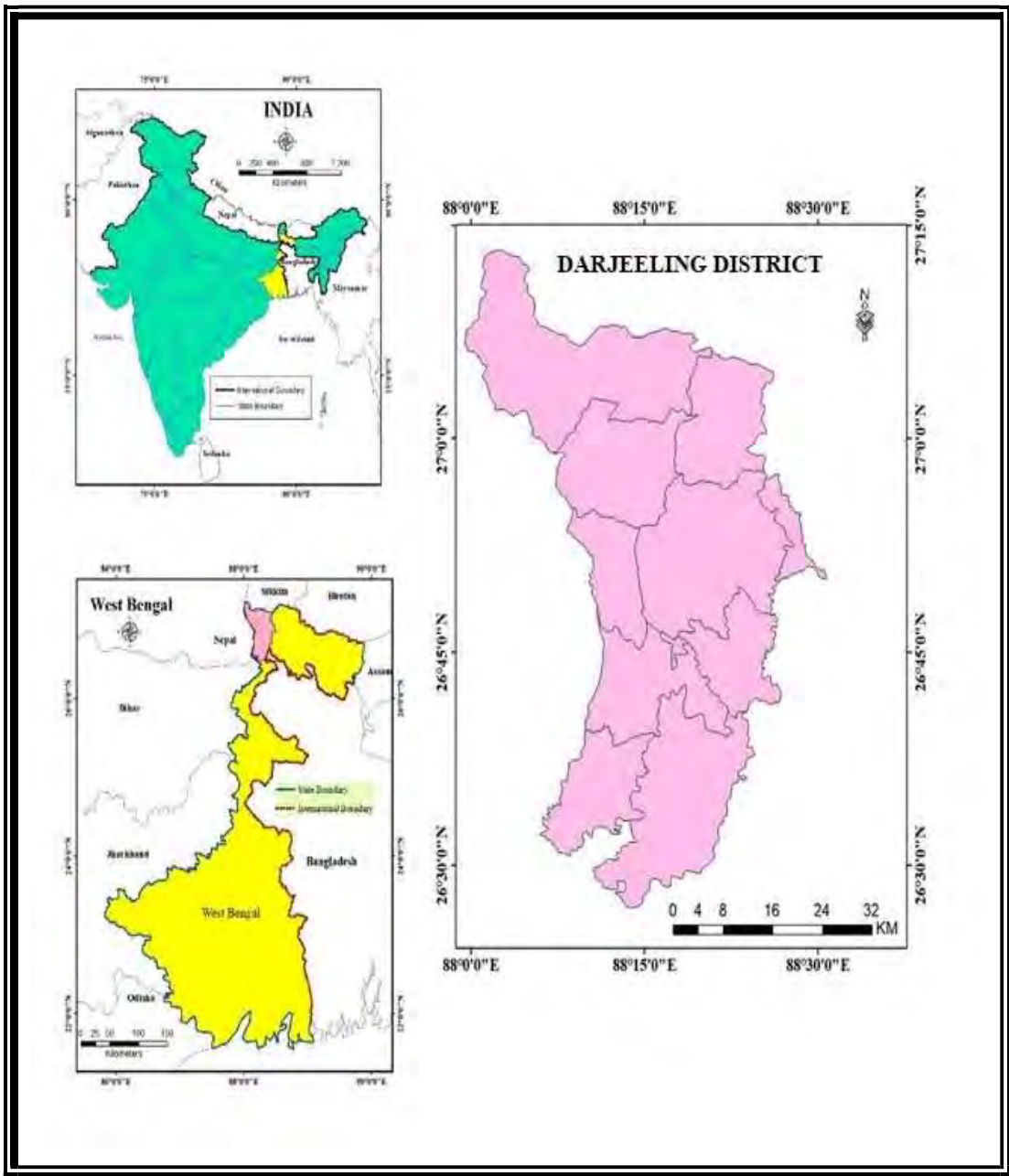
These tea gardens from Darjeeling Hills area are-

1. Badamtam,
2. Bannockburn,
3. Gayabari & Milikthong,
4. Happy Valley,
5. Kanchan View,
6. Makaibari,
7. Marybong,
8. Orange Valley,
9. Phoobsering,
10. Phuguri,
11. Risheehat,
12. Selim Hill,
13. Singbuli,
14. Sourenee, and
15. Tukvar tea gardens. (Map 1.3)

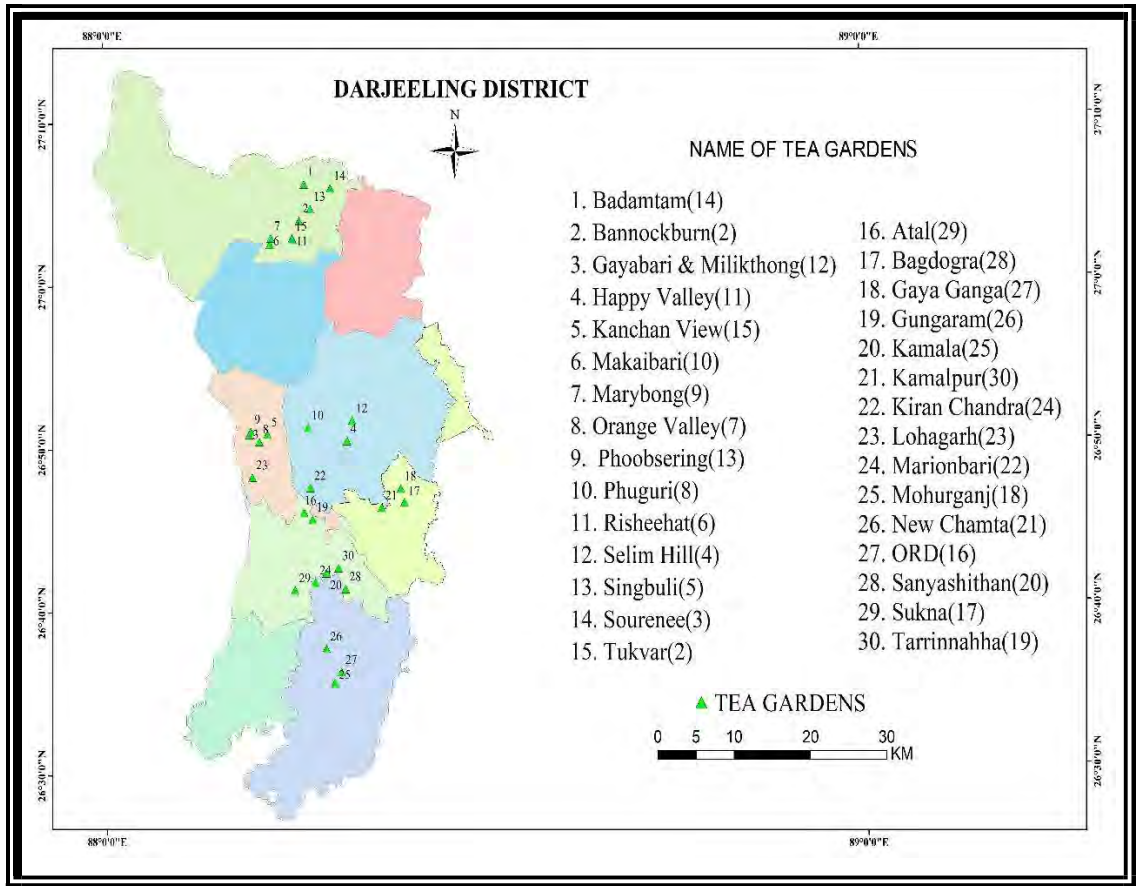
From the Terai region, selected tea gardens are-

1. Atal,
2. Bagdogra,
3. Gaya Ganga,
4. Gungaram,
5. Kamala,
6. Kamalpur,
7. Kiran Chandra,
8. Lohagarh,
9. Marionbari,
10. Mohurganj,
11. New Chamta,
12. ORD,
13. Sanyashithan,
14. Sukna, and
15. Tarrinnahha tea gardens. (Map 1.4)

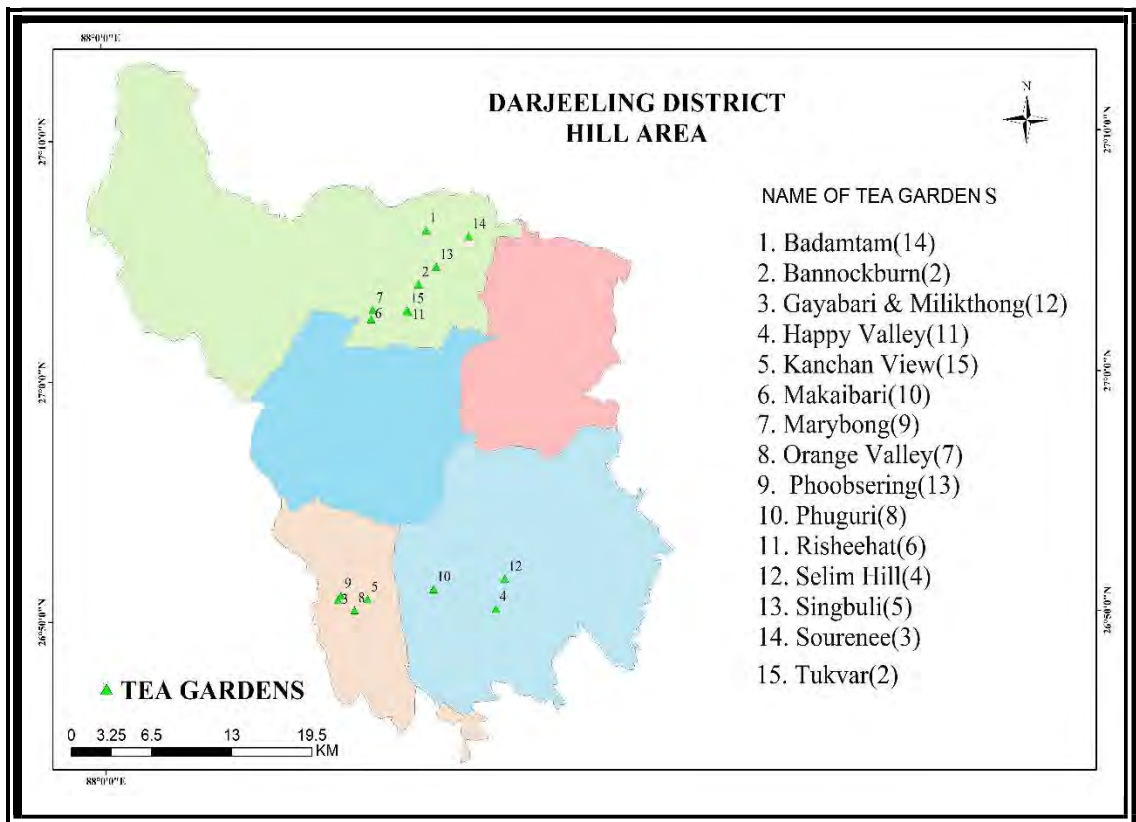
Fifteen tea gardens from Terai and fifteen from Darjeeling Hills are randomly selected for the study. (Map1.2) Geographically, the district has two brought physiographic divisions, the Hills and the Terai plain. The entire hilly area of the district comes under the high slope area. Administratively this district covers the three hill subdivisions of Darjeeling, Kurseong and Mirik. The foothills of the Darjeeling Himalayas come under the Siliguri subdivision especially known for its Terai plain area.



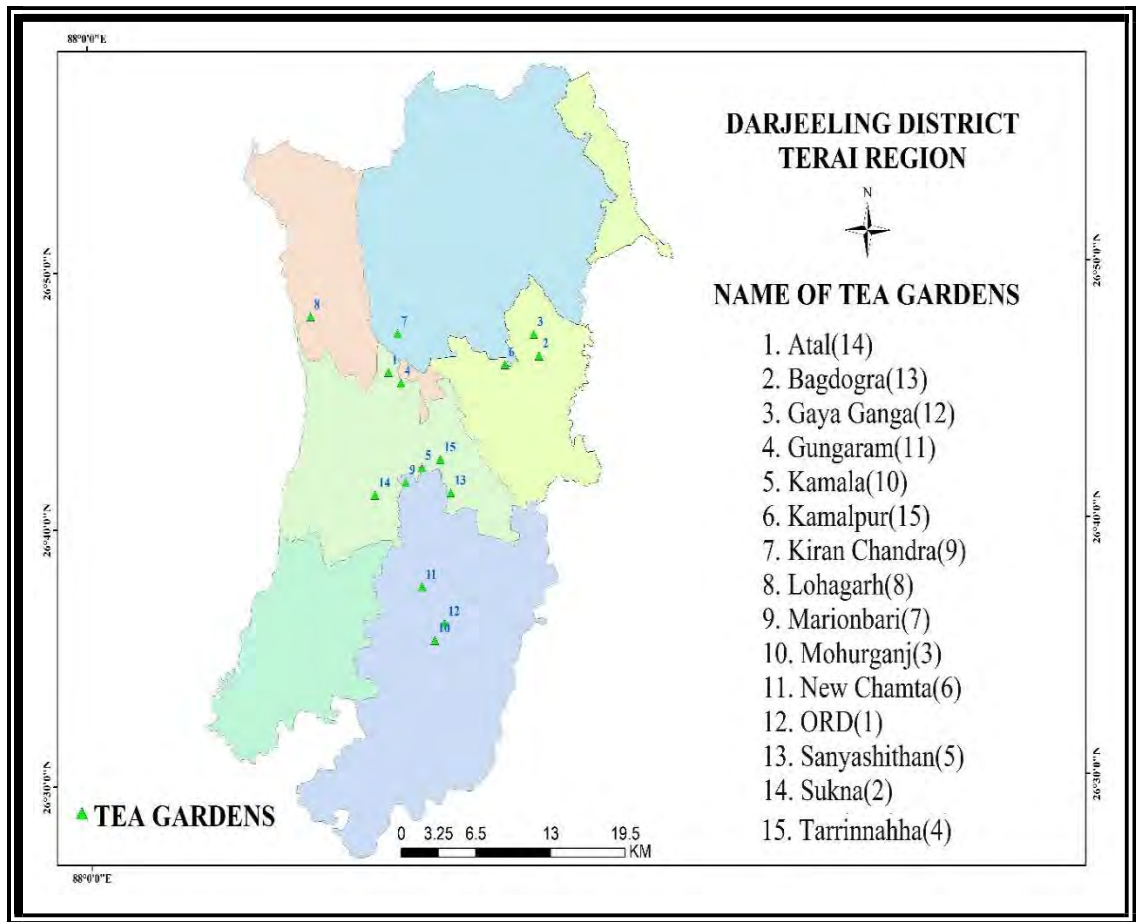
Map 1.1 Location Map.



Map 1.2 Location Map of tea gardens of Darjeeling District.



Map 1.3 Location Map of tea gardens in the Hill area of Darjeeling District.



Map 1.4 Location Map of tea gardens in the Terai region of Darjeeling District.

1.3 Significance of the study

The present study attempts to understand the socio-economic processes affecting the women workers on the tea plantation.

I) More than sixty per cent of the workers are women in the tea industry. So, the life of women workers and their working potential directly affects tea production and the society of tea gardens. So, the study of the role of women workers in tea plantations is the main scope of this study.

II) Various socio-economic phenomenon shapes the livelihood of women workers. So, an in-depth study of social parameters like – income, education, health facilities, etc., are essential to identify the problems of women workers in the gardens.

III) The working capacity of women workers exceeds the optimum level. In contrast, the facilities and civic amenities provided by the authorities could be better, negatively affecting tea production.

IV) Since colonial India, Tea gardens have acted as an isolated social unit concerning mainstream society. Tea garden belts hold a unique social atmosphere. Tea garden society has structure, form, tradition, and developmental background. Women are the most significant part of society. So, the study of women workers in tea plantations and conceptualizing the position of women in such a social unit can highlight the condition of women workers. It is evident that in the absence of significant economic, social, and political security, the life of women workers in the tea plantation is adversely affected, resulting in the degradation of human resources.

V) Darjeeling tea industry has various suitable conditions regarding tea production. However, production reduced in the last few years in many tea gardens of Darjeeling because of undergoing situation of the garden facilities offered to the labourer. Labour dissatisfaction is one of the leading causes of production fall. Brand loyalty of buyers is high in the Darjeeling tea industry. So, the market is entirely secure. Rational and scientific recommendations of developmental schemes for the use of skilled or trained women working force. Specific planning for women labour management can definitely uplift the condition of tea plantation of Darjeeling District.

1.4 Objectives of Study

1. To explore the role of women workers in tea plantation, their influence and their contribution in the tea plantation.
2. To correlate various phenomena associated with the Socio-economic and Socio-cultural background of the plantation women workers.
3. To assess the interrelationship between the role of women workers and the condition of tea gardens and thereby suggest the scientific management strategies for achieving a good running environment in the tea gardens.

To fulfil the above aims and objectives following hypotheses have been considered:

1.5 Hypothesis of the study

Hypothesis I: Tea plantation is a labour-intensive industry dominated by women workers. Socio-economic conditions of women workers have a direct impact on the tea industry.

Hypothesis II: Working capacity of women workers is related to the facilities provided by garden authorities. Working capacity of women workers influences the productive level and condition of tea plantation.

Hypothesis III: Improvement of the condition of the women workers in the tea plantation can enhance the tea garden standard vis-à-vis quality of life of the women workers associated with it.

1.6 Literature review

Watson (1936), former Chairman of the Indian Tea Association in London, had been represented in a historical document on how Tea Plantation was established in India. He emphasized the role of human resources for the betterment of the Tea Industry and mentioned the evolutionary quote "good with labour," which is still equally relevant. The reference of The Report of the Royal Commission on Labour in India, issued in 1931, is also an essential document for a better understanding of the history of the Indian Tea Industry.

Mitra et al. (1980), in their remarkable book, very comprehensively analyse the nature of work and work participation ordering of economic questions with a detailed study of 1961-1971 census data and its different aspects relating to the women workers discussed in various dimensions. It is a correlative study of the spatial and temporal variations in the occupational work participation of females. This book has a multi-spectrum study of female work participation vis-à-vis male work participation in the 1961-1971 censuses. The book discusses the shift in women's occupational participation from the census year 1961-1971.

Bhowmik (1981), in his remarkable book *Class formation in the plantation system*, starts with the scope and background of the tea industry of the Jalpaiguri District. Chapter two deals with the origins of the plantation labour force from 1874-1947. In this way plantation system and their socio-cultural life is discussed authentically, and the trade union movement is emphasised. In chapter six, very interestingly, ideology discusses the trade union movement, which is the book's best and most remarkable part. Sonali tea garden, with its history of the cooperative movement, took place in this study. This book justifies its name class formulation in the plantation system.

Bhadra (1983), in her study, reviews various perspectives on women's status. As the study is based on sociological aspects, different women working forces were considered, including the plantation women workers. The author mentions that the problem in women's studies is female awareness, which influences society's political and cultural structure. This study discussed that 'women plantation workers appear as a most neglected category in industrial sociology.' The author observes that promotions and opportunities are very few in her field area. However, women workers possess a more positive attitude regarding their work than their male counterparts.

Choudhury (1984) et al., in their book *sociological perspective of Plantation Labourer in Northeast India*, collected various articles focusing on tea plantations and the role of labourer. The chapter is divided into the population and the region, the plantation and colonial economy, workers, organizations and management in the plantation, and social and cultural aspects of plantation workers. Every 21 articles have a voice that can positively change the thought process. This book is very much essential for further research on tea plantations.

Syamroy (1985) mainly focused on the problem of the tea industry starting from the British period. Among the various problem, the author identified the most practical problem, which is associated with the nature of ownership and management. Poor management, quick profit tendency, and breaking of human rights negatively affected the industry, as discussed by the researcher. According to the researcher, another major problem associated with the sick marketing policy is responsible for the decline in tea production in the Darjeeling tea industry.

Shran (1985) focuses on the working conditions of the industrial and the non-industrial working-class women workers of Kanpur city and identifies differences in the socio-economic background. Women workers' awareness and the degree of their participation in trade union activities and to prove whether the extent of their trade union

participation varied with such social indicators as age, education, length of service, and job security situation of low participation among the women workers of Kanpur thoroughly explained. The study highlights some significant findings and questions are beneficial for micro-level generalizations.

Prasad (1988), in his book, attempted to look at the effects of tribal women workers concerning economic exploitation by examining the micro rather than the macro picture. Several sectors where tribal women workers are concentrated have tried to analyse the trends in those sectors. The aim of the study is not only to analyze but also to look for ways by which the position of tribal women workers can be strengthened, their opportunities and lives bettered, and their vulnerabilities decreased. So, the book is concluded with several recommendations, which is the best part of this book. Tribal woman worker, in particular the poor woman worker, is the central theme of the analysis. It is her labour and enterprise which creates the wealth of the nation and whose hard work leads to national growth. She needs security, a decent life, a share in the nation's prosperity, and the dream of a good life for her children. In a way, the change in the economy has brought about visibility for the tribal women worker, which did not exist before. The elements of liberalization and globalization have been explained and analyzed in great detail in many places, which is discussed comprehensively in this book. Physical exploitation in the working places discussed in this book enlightened the actual scenario of gender discrimination.

Barua (1989), in his book *Science and Practice in tea culture*, very warmly discussed various aspects of tea plantations. It is a handbook by scholars on how tea plants grow from a single leaf to the bush and two leaves and one bud. The soil of tea, shades, plucking every technical condition that makes tea cultivation fulfil to its optimum level is discussed in this book. In chapter fourteen, he discusses about tea, which is essential for understanding the tea plantation and its pulse.

Khan & Biswas (1991) discussed how Darjeeling tea's quality, reputation, and characteristics are essentially attributable to its geographical origin. As a result of a favourable geo-agro-climatic situation, specific soil characteristics, plantation conditions, traditional human practices, and a skilled local workforce, it possesses a specific flavour and a very high-quality tea. However, still, it faces some major problem that affects the production level of the Darjeeling tea industry. Traditional tea cultivation on steep, hilly terrain has brought economic betterment and well-being by improving the local inhabitants' employment. The majority of employees on Darjeeling's tea estates are

women. This book also discussed that, surprisingly, although legal measures are taken to protect Darjeeling tea against misappropriation, no measures are taken to increase the supply of the product on the domestic and international markets to reduce the shortfall between demand and supply by expanding the cultivated area, yields, and quantities produced. Many prospects of the Darjeeling tea industry are discussed in this book. It is important to mention that problem of the Darjeeling tea industry is given more emphasis in this study.

Bhadra (1992), in her book '*women workers of the Plantation in India*', discussed the women workers of the population from a sociological viewpoint. In her introduction chapter, she divided women's studies into Marxist, functional, and feminist perspectives and discussed the industrial anthropology of women. In the second chapter; women in the working force in India is a comparative study among various fields of work where women took a significant role. The plantation in the chapter there discusses population and residences in such a manner that this book, Bhadra M. took Chandmoni as her case study. This book is a landmark book in this sector. After time passes, more data recommendations are needed for a better understanding.

Baghel (1995), in his book, lucidly discussed the outcomes of environmental factors which are responsible for most of the natural resources which determine the base for the economic development of a particular region. Resource; Natural and human plays a significant role in developing the national economy. In this way, we can understand the importance of tea plantations as natural resources and their evolution spatial distribution among the human population.

In their book, **Bhadra & Bhadra (1997)** thoroughly discussed the plantation labour of Northeast India. Sibshankar Mukherjee, in his paper, discusses the plantation economy evolution and patterns in a thought-provoking and analytic remanding in mind that the plantation economy was very highly labour intensive. In her paper, Badra says plantation women workers and their commitment to industrial work is a sincere duty on the work participation pattern of women workers in the plantation. All the articles in these books are best and through provoking in their way. Figures and facts are less related to the quantitative study, but the rational discussion makes this book a research facility.

In their book, **Jha et al. (1998)** critically examined the social theories of womanhood. This book deals with the situation of women in India, which is quite miserable, and a great deal needs to be done on their behalf. So, that the women's cause in the country gains the massive support that it needs, it is essential to understand the

Indian context thoroughly with sensitivity to Indian Society. The social transformation of women is discussed in detail.

Kar & Wati (1998) discussed how Women constitute half the human resources. This book also shows us how half the nation's human resource is neglected; the country's overall progress would be hampered. Recognizing the need for women in various economic development activities, the Government of India has initiated several positive measures through different programs and schemes to bring them into the mainstream of development. This affirmative action has brought about perceptible changes in the socio-economic conditions of women. This book is an effort to capture the statistical situation of women and girls in India, as revealed by many social indicators available in widely scattered sources various indicators covered in this book like demography and vital statistics, health and nutritional status.

DasGupta (1999) in his book analysed various integrated aspects of the Tea Industry of North Bengal. It is the most authentic interdisciplinary book in the zone of tea plantations. This book is divided into nine chapters. Chapter Seven deals explicitly with Women Labourer in Tea Gardens. The author suggested valuable recommendations for the improvement of the Tea Industry.

De (2000) discussed productivity stagnation in the Darjeeling tea plantation, how it affects the common labourer, and how much sickness declines productivity. This study also discussed different measures to arrest this stagnation in tea production. Researchers comparatively analysed the relationship between Darjeeling tea's production, productivity level, and growth rate. The researcher observes that Darjeeling tea registered the lowest increase in terms of yield.

Ghosh (2000) this study is based on anthropological and sociological aspects. The research focused on specific questions regarding Adivasi girls in the tea industry. The author mentions how girl child abused by negligence, deprivation, discrimination, rejection, and other healthcare facilities. Some case studies highlight various problems regarding Adivasi girl children. A comparative study is also considered, which admits that in Adivasi society, the economic condition mainly controls preference for girls and children.

Tharabhai (2000), in his book, analyses the concept of women's studies after looking into the existing terms from a historical perspective, which includes significant concepts used in the discipline. He analysed how pioneers of women's studies in India were overwhelmed by action-oriented researchers and then theory-building studies. In

India, women workers had a different perspective due to the various categories of women. This pluralistic tendency of society penetrates down, and one can see the groups of different natures and textures. Class, caste, and educational background of women and workers give tremendous differences to the behaviour pattern of women, and this approach and attitude of women differ.

Hara (2001), in 'Green Tea Health Benefits and Applications', introduced the tea history, which is very interesting and new to the southeastern tea history. His technical regularity tea is also helpful to understand the history of tea through it is a book of tea in terms of scientific analysis but still out's lucid language makes some very informative for further study.

Lama (2004), in his doctoral thesis very lucidly, identifies the changing pattern of women's involvement in socio-economic and political development. This study is focused on specific questions regarding women's position in the Darjeeling District.

Singh et al. (2006), in their book 'Socio-economic and political problems of the Garden works-a Study of Assam' introduced the historical background of Assam tea. Chapter Two is about the labour requirement in the tea plantation tea industry, and the role of women workers is thoroughly discussed and analysed in the fourth chapter. In contrast, political participation and problems and prospects discuss scientifically. This book is beneficial for further research; Appendix V's speech at the player's dinner at Silchar is very much through the province.

Biswas et al. (2005), in their paper based on world health organization criteria for Body Mass Index in all six open gardens surveyed in the Dooars region of Jalpaiguri District, show that malnutrition exists in all six gardens. Government relief schemes like ICDS and MDMS are irregular. They discussed thoroughly the causes of these discriminations. Their case studies added a more specific dimension to the study. The authors also observed some favourable aspects of pregnant and breastfeeding mothers. They understand the significance of consuming extra nutrients. However, the study does not cover the pre-and post-natal health situation of the workers.

Chatterjee (2005), Women workers have been a crucial sector of the labour force engaged in the Plantation Industry in India. A majority of the plantation's labourers are women workers. Owing to this very fact that soft hands and nimble fingers are suited especially for tea leave plucking and picking of coffee seeds, women workers dominate the employment scene in these Plantations. An essential contribution to the Indian

economy by way of exports notwithstanding, the wages of workers in the plantation sector, especially the women workers, continue to remain low. The ineffective implementation of the statutory provisions has impeded progress in alleviating the plight of women workers in this industry. The historical and cultural backgrounds of the gardens are depicted in a very in-depth manner. Thus, this book crosses its disciplinary boundary and gives a thought-provoking flavour to the readers.

Regidor (2006) critically delights that the emergence of theoretical models of social determinants of health is necessary to understand health inequalities better. This paper is also essential to clarify the conceptual ambiguity regarding Social Determinants of Health, Health Inequalities, which critically argue upon Social Economic Position.

Griffith (2007), son of Sir Percival Griffith, lucidly describes his adventures with tea and the history of tea in his pen classic epic. Sir Percival Griffith's book 'the history of the Indian tea industry' is a landmark for any tea researcher. On the other hand, Griffith's book is a handbook of research in various ways. The first chapter starts with a question whose cup of tea? This is enough to mention the notion of this book. In chapter two, just another camellia, and in the third, he up heels such relevant questions which are significant in a widespread way, but relevance and effects are very remarkable. In his eight-chapter ma bap, his concerns about the workers reveal. This book is a tremendous economic outline, with the chapter 'A nice cup of Tea' Tea and Taxes. A very British drink, another remarkable chapter.

Baruah (2008) discusses the tea industry of Assam's origin and development and discusses Assam tea very authentically. Minor ate gawkers of Assam and their virtue and problem, and his study is based on an empirical view point. So, Chapter II is designed under various tools and techniques, which are very much thought-provoking for any scholars. The tea taxonomy is discussed in Chapter VI, which is valuable for the qualitative value of tea. Chapter VII is another economically sound chapter that deals with the tea auction centres of Assam, a marketing channel. Chapter VIII is remarkable because it is discussing about contribution of these tea industries to the economy of assets. Chapter IX focuses on the problem of the in assess but ever the prospects of the industries discussed in this chapter. This book thoroughly discussed and depicted various aspects of assessing tea. So, this book has various brought outlooks with some limitations too.

Lawrence & Worsley (2008) represented various articles focusing on the sub-themes, e.g., Principles, Populations, Priorities, and Practice. The first article of the editors is based on the question- What is public health nutrition? Article Number Four by

Scott, J. et al.; dealt with the health of Mothers and Infants. The seventh article by Burns, C. et al. comprehensively analyses the conditions of economically, geographically, and socially disadvantaged communities. Rutishauser, I. et al. emphasized Monitoring the food and nutrition situation and the practical practices of policy interventions. Lastly paper of Lawrence, L. has various questions regarding public health nutrition policy practice.

Phadke (2008), in his book, empirically represents the status of women in north-eastern India based on the 1991 census data. North-east states include multiple communities with their own customs and cultural tradition in diverse ecological settings. In this book, women's economic status is viewed in the context of customary aspects that influence the choices available to the different status of the North-east. Geographically two major physiographic divisions (Hill & Plain) of north-east states are differently discussed accordingly to their discriminations and requirement. The health and educational status of north-eastern women is discussed in detail, where rural-urban differentiations and gender discriminations are analysed with a database.

Banerjee (2008) et al., in their book tea industry, a road map ahead, consists of five industry five chapters. The first chapter deals with the overview of the industry where agro-technology and direct marketing are considered. In chapter two, soil fertilizer and compacting and plant protection of tea are discussed, which is essential to understanding tea. Tea as an organic product is discussed in part three, and redressed issues of tea associations are rediscovered. At the end of the chapter, small chapter tea growers in Assam and North Bengal discuss. However, some aspects need more detailed discussion. Overall, the book is very much beneficial for the study.

Chapman (2010) says that "...the right to health requires greater attention to the social determinants of health, health inequalities, and power dynamics..." This paper portrayed how the right to health is necessarily incorporated through the integral determinants of health. The very lucid study considers the relationship between human rights and development communities as two integral parts of the policy intervention.

Sinha (2013), in his book, depicts world health and development in North East India. Chapter One is significant; it depicts how various commerce are interlinked with the history and out spreads of health and health issues. All chapters discussed health, healthcare issues and development.

In their paper, **Thugwel et al. (2010)** comprehensively discussed the outcome of the World Health Organization's report on 'The Commission of Social Determinants for

Health'. This paper focuses on the methodological improvement regarding the study of health issues discussed in the commission's report. This paper is based on the in-depth study conducted through the Campbell and Cochrane Equity Methods Group and The Measurement and Evidence Knowledge Network. Recommendations for applying systematic and adequate measures are thought-provoking, and their multidimensional approaches are helpful for further study. This paper is essential to understand the need for an integrated study based on primary evidence.

Mishra et al. (2014) in their book unfolding crisis in Asia's tea plantation (employment and Occupational and Mobility) Industry, introduced tea in the Indian sector in assessing comparative mobility among tea garden bonuses showing various undergrounded fields among the given economic chapter. This book is beautiful, and the conclusive part is very vocal and comprehensive.

Biswas (2015), in his doctoral thesis very effectively discussed the emergence of Bengali entrepreneurship in the Himalayan region. This work is very important for the study of the Darjeeling tea industry because it chronologically discusses the period from 1879-2000. This thesis is based on the in-depth study conducted through the insight thoughts regarding the tea plantation and its relation with the workers and the authorities of the gardens. The very lucid study considers the relationship between human resource development, community awareness and policy intervention. The very logical study considers the relationship between development of communities in the Himalayan belt as part of the policy intervention for the tea industries. His multidimensional approach is very helpful for further study.

1.7 Methodology

After determining the research problem and considering all the objectives and hypotheses strategies needed which provided specific direction to the study, as the study is based on social aspects, the mixed method approach is selected as the inquiry strategy. This mixed-method approach is based on both Quantitative and Qualitative methods. (Ahuja, 2001)

A. Primary Data Sources: Year-wise primary data regarding productions and wages from the surveyed tea gardens have been collected during the survey. Those are compiled as Tables, Figures, and Maps in the respective chapters.

B. Sampling size, techniques, and survey procedure: From the 86 registered tea gardens of the Darjeeling Hill area, 15 tea gardens and 53 registered tea gardens of Terai region, 15 tea gardens have been selected for the survey purposes.

So, 17 per cent of Hill tea gardens and 28 per cent of Terai tea gardens have been surveyed, and 30 tea gardens covering all the sub-divisions of Darjeeling District have been considered for the survey.

For the surveying in all tea gardens, Random Sampling Method and Purposive Sampling Method have been taken under consideration. From all the tea gardens, 12 households were selected randomly for the survey purpose. Thirty tea garden managers are taken under consideration for the personal-level interview processes.

The Sample has been determined by the Cochran (1977) formula for finite population. In the study area, permanent women workers in thirty tea gardens are 14324. So, using the following formula sample size has been determined-

$$n = \frac{n_0}{1 + \frac{n_0}{N}}$$

where

$$n_0 = \frac{z^2 p(1-p)}{e^2},$$

N is the population size, *z* is the standard normal variate based on the confidence coefficient, *p* is the estimate for *P*, and *e* is a specified margin of error.

Considering this formula, the sample determination has been taken into account. And determined 360 samples are equally divided into thirty tea gardens. Thus, the 12 number of households determined in every tea gardens. From all the tea gardens, 12 households were selected randomly for the survey purpose. Thirty tea garden managers are taken under consideration for the personal-level interview processes. Following the formula, the sample determination is as follows-

Table 1.1 Sample Determination

Z^2	Z Score	1.880793608	3.537384596
	Confidence Interval	94%	
	Alpha Divided by 2	0.03	
p		0.5	
Error		0.05	
Population Size		14324	
no		353.7384596	
		1,024695508	
Sample Size		345.2132432	
Non-Responded Sample		17.26066216	
Final Sample Size		362.4739053	
		or 360	

Fifteen tea gardens of Darjeeling Hill area are as follows - Badamtam, Bannockburn, Gayabari & Milikthong, Happy Valley, Kanchan View, Makaibari, Marybong, Orange Valley, Phoobsering, Phuguri, Rishchat, Selim Hill, Singbuli, Soureni, and Tukvar.

From the Terai region, randomly selected tea gardens are Atal, Bagdogra, Gaya Ganga, Gungaram, Kamala, Kamalpur, Kiran Chandra, Lohagarh, Marionbari, Mohurganj, New Chamta, ORD, Sanyashithan, Sukna, Tarrinnaha tea estates. (Map- 1.2)

The surveyed population included exclusively permanent tea plantation women workers. A specially designed structural questionnaire schedule with open and closed-ended questions has been considered to collect the required data.

C. Secondary Data Sources: Secondary data have been collected from below-

1. Tea Statistics
2. Statistical Accounts of Bengal
3. Bengal District Gazetteers, Darjeeling

4. National Bank for Agriculture and Rural Development (NABARD)
5. Food and Agriculture Organization Corporate Statistical Database (FAOSTAT)
6. Darjeeling Tea Association (D.T.A. Darjeeling)
7. Annual Reports of Tea Gardens.

Apart from that, for the reference works, the Central Library of North Bengal University; Library of Centre for Women Studies, NBU; Library of Geography and Applied Geography, NBU; Library of Anthropology, NBU; Library of Tea Management, NBU; District Library, Jalpaiguri have been consulted. For the collection of secondary data Tea Board of India, Jalpaiguri; Tea Board of India, Siliguri, Labour Office, Jalpaiguri; Labour office, Siliguri; District magistrate office, Siliguri, D.T.A, Darjeeling, TIPA, Matigara; TBITA, Bengdubi, Siliguri; has been visited several times for the collection of required data and the valuable, authentic opinions.

D. Statistical Techniques: After collecting all the primary and secondary data, calculation and tabulation have been considered. Tabulated data were analysed according to the aim and objective of the studies. Three hypotheses have been taken into consideration. Among them, the first hypothesis is proved in chapter four, the second hypothesis is proved in chapter five, and the third hypothesis is proved in chapter six. For this purpose, statistical techniques have been taken into consideration.

Hypothesis I - Tea plantation is a labour intensive industry dominated by women workers. Socio-economic conditions of women workers have a direct impact on the tea industry.

During the survey, data were collected on the sex-wise distribution of plantation permanent workers. (Fig - 4.2 (A) & 4.2 (B)) which clearly shows that the women workers are more than 60% of Darjeeling tea plantation. Data from earlier researchers have been taken under the condition to overview this point. This data is supported by the literature review and data of earlier research, which have been discussed under the subheading 'Plantation women workers from past to present'. From the earlier data, it is also clear that women workers are the dominating working force in the tea gardens of the Darjeeling

District. So, 60 per cent of women workers are neglected, and socio-economic conditions are also decreased. Alternatively, it is proved that if 60 per cent of workers of gardeners set good socio-economic conditions, the garden society will automatically flourish. To prove this hypothesis t-test has been taken into consideration to prove the hypothesis whether accepted or not. Chapter V also relates to this hypothesis, where various socio-economic parameters like education, health condition, housing, etc., are discussed thoroughly. The level of education has been calculated and presented by the bar graphs, which depict that educational condition is high in those gardens where the garden authorities provide facilities. Another essential statistical calculation has been made to determine the relationship between family members and the income level of women workers. Bivariate Analysis has been taken into consideration. So, discussing all the factors empirically and qualitatively, it is proved that women workers are the dominating force in the tea gardens of Darjeeling, and their socio-economic conditions are the main factors for the betterment of the tea gardens.

Hypothesis II - Working capacity of women workers is related to the facilities provided by garden authorities. Working capacity of women workers influences the productive level and condition of tea plantation.

This hypothesis is primarily discussed in Chapter V, under tea production in the Darjeeling district. The level of production of surveyed tea gardens of the Darjeeling District is presented with a Time series analysis. Data on production have been taken under consideration from 2000 to 2016. The moving average of production has been calculated. After that area of the tea gardens is taken under discussion, and an area map have been prepared to calculate the yields of the tea gardens. With the help of this yield data and socio-economic condition, an analysis has been taken under consideration in Chapter V under the relationship between production and socio-economic condition. Multiple Regression Analyses have been considered to prove the relationship between production and facilities provided to the women workers in the garden. Income is considered as the dependent variable. Furthermore, the yield, household amenities, household facilities, educational facilities, and medical facilities have been considered independent variables. The Likert scale has been considered to rank household facilities from one to five. Drainage facilities, bathrooms, kitchens, roof type, and drinking water facilities are considered in the ranking. A garden that has five facilities ensure five points. On the other hand, one garden has two or one facility ensuring a score of two or one.

Thus, household amenities are also taken into consideration. Electricity, television, refrigerator, bike or cycle, and telephone or mobile. These five amenities have been considered for the ranking according to the Likert scale. To assess the educational facilities, five parameters have been taken under consideration. The presence of a primary school, a secondary school, an Anganwari centre, etc. For the medical facilities, five parameters are hospitals, doctors, oxygen, ambulance and blood bank presence. After that, all the ranking data are analysed with the help of SPSS. With the value of R square, a map has been prepared that shows the relationship between production, income, and social facilities. Data reveals that those gardens are in good condition, providing adequate facilities to their women workers. An ANOVA test has been conducted to prove this hypothesis statistically. So, hypothesis II is statistically proven in chapter V, showing a definite influence of women workers on production level and socio-economic status. Udai Pareek's method of the Socio-Economic Index and Standard of Living Index (SLI) have been considered to determine the socio-economic status of women workers.

Hypothesis III - Improvement of the condition of the women workers in the tea plantation can enhance the tea garden standard vis-à-vis quality of life of the women workers associated with it.

Chapter VI discusses the problems and hindrances to the women workers in the tea gardens of Darjeeling District. Furthermore, in the prospect chapter, it is discussed that if we consider the enhancement of this 60 per cent of women workers along with their counterparts, then the overall improvement of the garden is possible. Women play dual roles in gardens; they are the economic persons, and on the other hand, they are the homemaker and mothers. Geographically Darjeeling District is divided into two major physiographic divisions. One is a hill area, and the other is Terai Plain. Life and livelihood of the women workers are far different from each other in these two regions. Enhanced living standards can also enhance the working condition of these two different geographical areas in the same district. So, recommendations are introduced to all the factors keeping in mind. In Chapter VI, the Chi-square test and Factor analysis also have been considered for a better understanding of the interrelationships of the factors. So, it is clear from the detailed survey-based analysis that improvement in the living conditions of women workers is very much needed. Moreover, with these improved living conditions, quality of life, items of educational facilities, health conditions, housing and decision-making are also enhanced. Women workers are a more liable and trusted labour

force in tea gardens. Improving the condition of their life authorities are improving their garden condition in the long term. Women workers play a prominent role in the Darjeeling district's tea gardens.

E. Map Making – To get an accurate conceptual and visual impression of the whole study area, systematic mapping of the Darjeeling District has been done. The published map of Darjeeling District by NATMO, GSI, Tea Board of India have been considered for the final map making. Slope Map and Elevation Map have also been prepared based on data from earthdata.nasa.gov. Other Maps are prepared from the NATMO map on the GIS platform. Global Mapper, ERDAS, and QGIS are used to prepare the map.

1.8 Conclusion

The women workers of Darjeeling district's tea plantation face various problems in their gardens. Some time management needs to carry more to solve women workers' problems. So, socio-economically they are an unprivileged and weak sector of society. Detailed survey-based suggestions should be considered to improve the condition of women workers in the Darjeeling District. Changes in their living conditions can enhance the garden society's condition

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