

**WOMEN IN DEVELOPMENT: A STUDY OF WOMEN'S LABOUR FORCE
PARTICIPATION IN MOUNTAIN FARMING SYSTEMS WITH SPECIAL
REFERENCE TO THE DARJEELING HILLS OF WEST BENGAL**

A Thesis Submitted to the University of North Bengal

**For the Award of
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in
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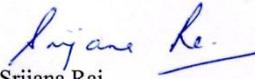
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DECLARATION

I declare that the thesis entitled “Women in Development: A Study of Women’s Labour Force Participation in Mountain Farming Systems with Special Reference to the Darjeeling Hills of West Bengal” has been prepared by me under the guidance of Sanchari Roy Mukherjee, Professor of Economics, University of North Bengal. No part of this thesis has formed the basis for the award of any degree or fellowship previously.


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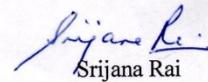
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ABSTRACT

Women's involvement in economic activities has intrigued scholars as they searched for possible explanations as to why some women choose to work and others don't. Nevertheless, given the fact that all women work, within or outside their homes and with or without remuneration, the primary issue is that of recognition of women's labour and their contributions to the process of economic and human development. The issue of invisibility of women's contributions is closely linked to the gender division of labour which has traditionally been determined by the biological differences between men and women with women's primary role being that of a homemaker and men's role being that of a breadwinner. Since much of women's work is mostly confined within the precincts of the household and is rarely exchanged for a price in the market, it is overlooked in national income statistics which takes into account only remunerative work. The fact that a significant proportion of women's work especially in subsistence economies of developing countries is unpaid hence unaccounted, causes women's work to be of lesser importance and secondary in nature vis-a-vis men's work, the implication being women's disadvantaged and inferior status within the household and in society. This lack of visibility is one of the prime reasons for less attention being paid to women's employment in policy formulations. For development efforts to be inclusive therefore, it is imperative that women are integrated into the development agenda through monetization and valuation of their non-market work contributions and increased participation in market work. Women in the hill regions show higher participation rates in comparison to their counterparts in the plains primarily due to high rate of male outmigration along with less severe gender division of labour particularly in agriculture and less prevalence of class/caste distinctions. The high work participation nevertheless does not indicate women's improved status, but reflects their drudgery and hard labour as most are employed as family farm labour rather than wage labour. Literature on relatively high work participation of women in hill regions being somewhat scarce, the present study has been undertaken with the primary objective of highlighting the significant role of women in the rural hill economy of the Darjeeling hills of West Bengal. This has been done through an examination of the nature and extent of their work in mountain farming systems by analysing (a) the gender division of labour in agriculture and domestic activities, (b) the gender differentials in time allocation, (c) gender differentials in time allocation according to size class of holdings, (d) the determinants of rural female work participation (e) the determinants of women's time allocation to agriculture, (f) women's contributions to household food

security and (g) women's access to productive resources. The present study has been conducted in the hill regions of the Darjeeling district (including Kalimpong sub-division) of West Bengal. Using multi-stage purposive and random sampling techniques and choosing one village each from the three hill sub-divisions of Darjeeling Sadar, Kalimpong and Kurseong having a relatively higher proportion of agricultural workers, a sample of fifty households has been selected from each village giving a total sample size of 150 households. The households are engaged in agricultural activities either for subsistence or for commercial purposes. Analytical tools such as Analysis of Variance (ANOVA), logistic regression, multiple linear regression, percentages etc. have been used to test the various hypotheses. According to the Census 2011, the district of Darjeeling occupies 3.55 percent of the total area and inhabits 2.02 percent of the total population of the state, with 47 percent of the district's population residing in the hills. The female work participation rate (WPR) in the district is 22.4 percent which is the sixth highest among the state's nineteen districts. The villages of Git Dubling Khasmahal, Sitong Khasmahal and Samalbong chosen for the present study are primarily agrarian in character, with the proportion of households dependent on agriculture as a primary activity being 70, 44 and 38 percent respectively. Most of the land holdings are marginal with the average size varying between 1.4 acres in Samalbong to 1.7 acres in Sitong Khasmahal and 2.8 acres in Git Dubling Khasmahal villages. The female WPR according to the usual principal activity status (ps) is 41.6, 52.8 and 47.8 percent respectively in Samalbong, Git Dubling Khasmahal and Sitong Khasmahal villages with a large proportion being engaged in agriculture. The study reports a predominance of female family labour in agriculture in all the villages. The results of the study indicate no prominent gender division of labour in crop production and livestock rearing as men and women equally participate in almost all activities. However, the gendered nature of household work is starkly visible with the bulk of it being performed by women with little help from men. This has also been confirmed by the results of the ANOVA test. A logistic regression analysis has been undertaken to identify the determinants of women's participation in (a) paid and unpaid work, and (b) paid work only. Controlling for other variables, women from unitary and agricultural households are more likely to participate in paid and unpaid work as family labour, with age having a non-linear effect on women's participation. While higher levels of education and unitary family structure enhance women's participation in paid activities, presence of children below the age of six, and large landholdings of the household restrict it. Factors affecting the time spent by women in agriculture have been determined through a multiple regression exercise. The results indicate that the time spent by women in agriculture increases

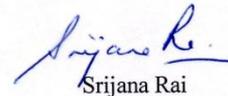
for married women and for those belonging to agricultural households and having larger land holdings, whereas time spent decreases with women's higher level of education and more time spent by men in agriculture. Age has a non-linear effect with time investment to agriculture increasing up to a certain age beyond which it decreases. The key role that women play in ensuring food security can be understood from their high level of participation in agriculture and domestic activities. The average participation for the three villages in crop production, animal husbandry and household activities is 53, 56 and 78 percent respectively. Despite their significant contributions to the rural hill economy, women's access to productive resources is highly unequal which is evident from the fact that only 5 percent of women have ownership of land either individually or jointly. Only 26 percent of women had loans granted in their names and 30 percent had attended training programmes. Nevertheless, 54 percent of women had membership of the self-help groups (SHGs) and 70 percent had an account in the bank or the post office. Realising women's crucial contributions to the rural hill economy, the study therefore recommends policies which would help improve women's status through their increased involvement in economic activities and inclusion of gender perspectives in mountain development policies. These may take the form of (a) new avenues for women's self employment in agriculture (b) women's higher involvement in co-operative dairy farming (c) development of handicrafts and cottage industries with higher participation of women (d) provision of micro credit, training, extension services and skill development programmes for women (e) improvement in overall social infrastructure for reducing women's work burdens.

PREFACE

Despite considerable progress achieved by nations throughout the world in terms of high growth rates and increasing levels of per capita income, a fact that cannot be overlooked is the persistence of the problem of gender inequality which exists to a greater or lesser degree in almost all the countries. In most societies women are known to occupy a position subordinate to that of men socially, economically and politically which may be considered to be an outcome of society's perceptions regarding gender roles, gender division of labour and the valuation of women's work. Women, being naturally engaged in procreation and nurturing usually participate in activities which are carried out within the vicinity of the household and are not marketed, which is the primary cause for their contributions being considered to be of lesser value and invisible in national income accounts. However, women are important agents of production since their unpaid work contributes to economic and human development in a significant way. Inclusion of women in the development agenda may thus be regarded as an important priority for achieving the goals of gender equity. Life for the women in the rural areas of the hill regions is particularly challenging due to numerous factors such as the harsh climate, inaccessibility, remoteness, lack of infrastructure etc. In addition, the movement of working aged men to towns, cities and lowland areas in search of better employment opportunities leaving behind only the women folk to fend for themselves increases their work burdens leading to their higher work participation. However, being involved predominantly as family labor rather than wage labour, the work contributions of these women are subject to statistical invisibility despite being an important component of the labour force. The present research study has therefore been undertaken in the hill district of Darjeeling in West Bengal with the primary objective of highlighting the significant role that rural women in the hill regions play for the sustenance of their households. The study is a humble attempt to bring to light the nature and extent of women's work in the study area along with a description of the constraints they face, besides also providing some suggestions for improving their conditions which will lead to an increase in individual and familial well being.

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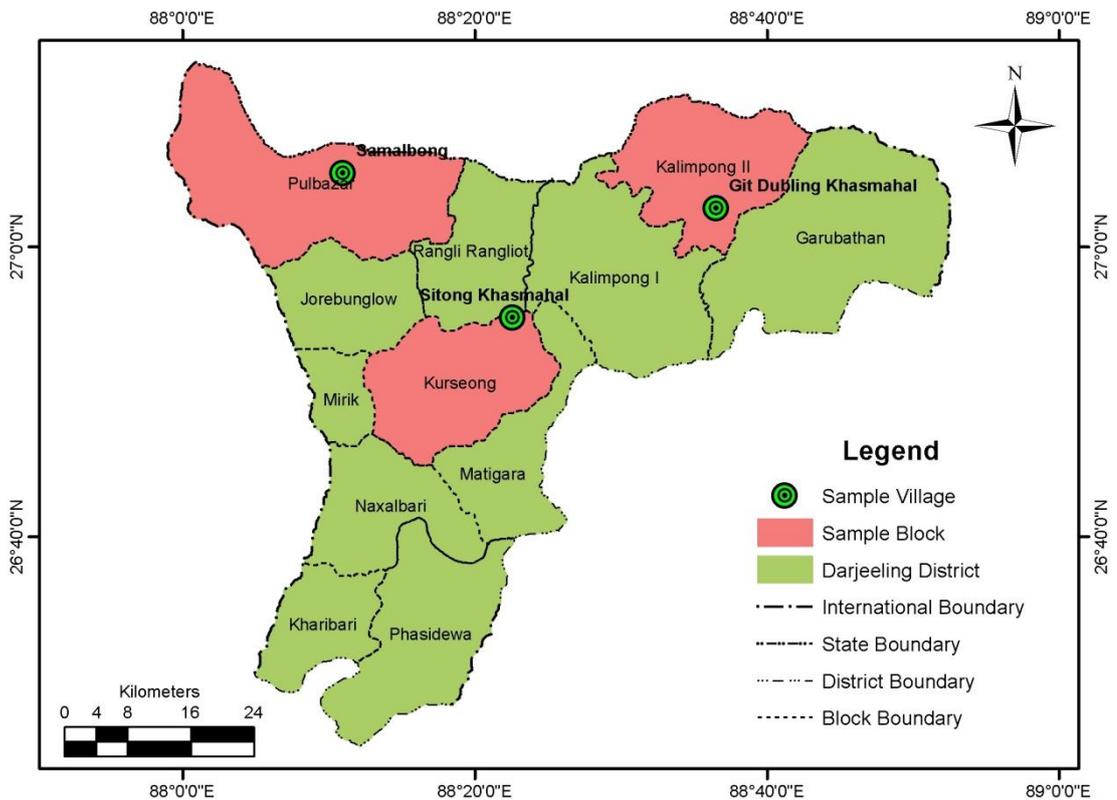
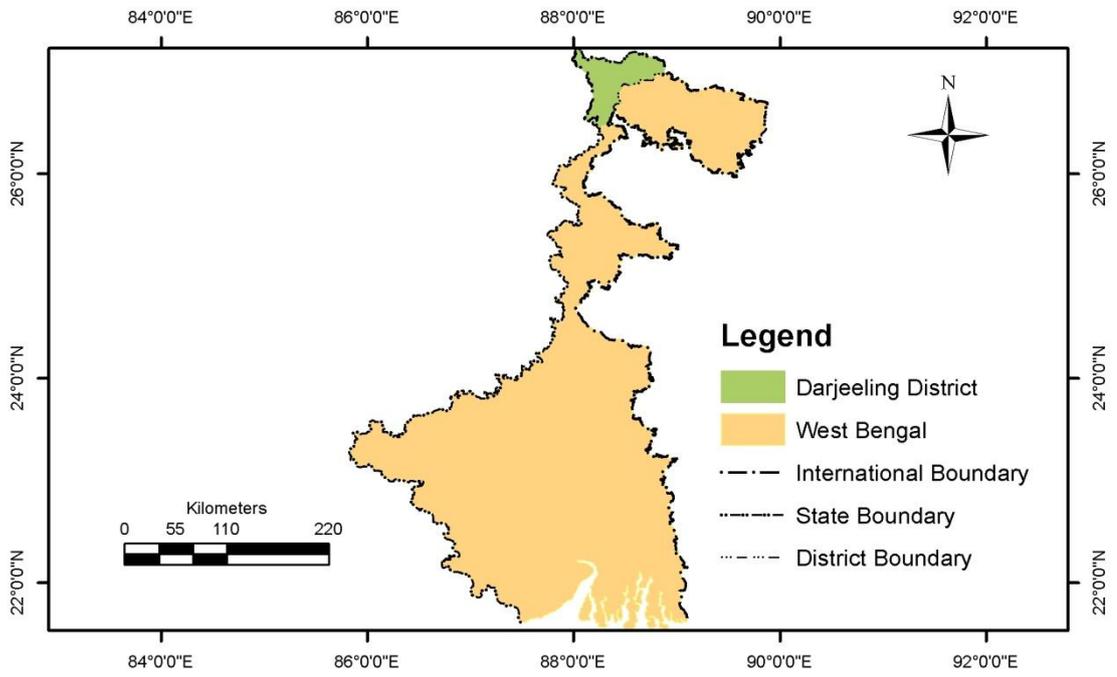
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Location Map of the Study Area



Chapter I

Women and Work: An Introduction

1. 1. INTRODUCTION

Women comprise almost fifty percent of the global population, hence their contribution to the economic development of any nation may be considered at par with men who comprise the remaining fifty. However the contribution of women to economic development is grossly underestimated and undervalued primarily due to the non-recognition and non monetization of the majority of the activities that they perform and their consequent exclusion from statistical enumeration. The most important reason for this is the flaws in the definition and concept of national income which takes into account only remunerative/paid work and not the unremunerative/unpaid activities that women perform, especially in poor subsistence economies. This “invisibility” of women’s work is a major reason why women’s employment is not regarded as a specific activity in research or policy formulation (Sundar, 1981). The socially constructed gender ideologies contribute to this invisibility by creating a hierarchy in men’s and women’s roles with men operating in the public domain, more specifically the market, and women being confined to the private i.e. the household which render women’s unpaid work “invisible” leading to women’s status being inferior to that of men.

The undervaluation of women’s activities can be regarded as a manifestation of the several inequalities that women face in almost all spheres, albeit in varying intensities across countries, cultures, religions etc. According to the Human Development Report, 1995 women’s contributions to human development is far too much than the benefits they receive from it which may be attributed to their unequal status (UNDP, 1995, p. 29). Participation of women in economic activities or female labour force participation (FLFP) plays a crucial role in removing such inequalities besides improving women’s economic position. Female labour force participation has been found to be positively correlated with improved well being of the women, in that it reduces gender inequalities and leads to empowerment. It leads to an increase in the familial well being as well, especially the well being of the girl children as intra household inequalities are decreased. In the long run, it may lead to lower levels of poverty and decline in population growth. Women’s labour force participation thus contributes significantly to human and economic development. However, an issue less emphasized is that if women participate in low paying jobs especially under conditions of distress, their progress towards equality may be hampered as such work increases their

drudgery rather than pulling them out of it (Chakraborty and Chakraborty, 2009; Srivastava and Srivastava, 2010).

The research on FLFP has primarily focused on identifying the determinants of FLFP and its impact on a number of issues viz., reduction of gender inequalities, empowerment and emancipation of women, welfare of women and children etc. However, women's labour market experiences are significantly different from that of men, in that it is more diverse and complex, and factors as varied as demographic, social, cultural, religious, reproductive and personal besides economic (Srivastava and Srivastava, 2010) play a more crucial role in determining FLFP vis-à-vis men for whom labour force participation is determined predominantly by economic factors.

For most of the developing countries of the world among which India is one, agriculture is still the primary occupation for the larger proportion of their population. It is well known that in the rural areas women's role in agriculture and its allied sectors is indispensable through their participation in various activities related to crop production, animal husbandry, horticulture, floriculture, fisheries, agro forestry etc. Women play a predominant role in the farming system of any country as cultivators, labourers and entrepreneurs, performing almost all agricultural activities from crop production to animal husbandry including ploughing and hoeing also in some cases, in addition to the household chores which is entirely a woman's domain. Although the degree and nature of their involvement vary between and within regions and across different farming systems, scholars are unanimous regarding the fact that women's contributions to agriculture is a lot more than they have been given credit for.

Mountain and hill areas belong to some of the least developed regions of any country. Women in these regions are reported to have relatively higher work participation (Reddy, 1979; Chen, 1989) vis-à-vis their counterparts in the plains. The higher work participation could be attributed to less stringent gender division of labour in these areas in contrast to the lowlands, with women partaking in almost all activities related to farming including ploughing and terracing the land, to harvesting (Chen, 1989) and hoeing. For the hill peasant women the burden is heavier owing to large scale out migration of men to the plains due to lack of employment opportunities in the hills, resulting in "feminization of mountain agriculture and livelihoods" (Kollmair, 2010). Owing to the constraints imposed by the topography and the climate which results in marginality, fragility and inaccessibility of the hill areas, agricultural activities pose a major challenge. Lack of land titles as a consequence of the patrilineal inheritance systems related to land ownership in most societies, stand in the

way of women's access to and availability of other productive resources such as loans along with financial and extension services which contribute to the under-performance of the agricultural sector. Analysis of women's role in mountain farming systems is therefore an important aspect of research on women's work.

1.2. FEMALE LABOUR FORCE PARTICIPATION

The issue of women's participation in the labour market has received considerable attention from scholars especially during the 1970s. A large amount research in this area has focused on determining the factors affecting women's labour market decisions and the impact of women's labour force participation on a number of issues viz. reduction of gender inequalities, empowerment and emancipation of women, increased role in decision making within the household or in legislative bodies, awareness regarding better health facilities which has a positive impact on women's well being and the well being of their families especially children etc. The various studies have helped provide important insights into the nature and the extent of women's involvement in economic activities along with pointing out the problems related to the definition and measurement of women's work. The relevance of studies on women's labour force participation is closely linked to the fact that women's labour market experiences vary from those of men and they are more diverse and complex (Srivastava and Srivastava, 2010).

The quantity of labour supplied by a country normally known as the labour force may be defined as "the population which supplies or offers to supply labour for pursuing economic activities for the production of goods and services and, therefore, includes both 'employed' and 'unemployed' persons/person-days. Labour-force participation rate (LFPR) is defined as the proportion of persons/person-days in the labour-force to the total persons/person-days" (GoI, 2013). The Work Participation Rate (WPR) on the other hand shows the proportion of workers in the labour force and indicates the demand for labour. It therefore shows that portion of the labour force which is active. In the present study however the terms female labour force participation and work participation have been used interchangeably in certain instances. Since labour is the primary asset of the larger proportion of the poor, reduction of poverty and ensuring food security in the long run in low income countries calls for expansion of productive employment (Dev, 2008, p. 167). According to the Human Development Report (2015), importance of work stems from the fact that it provides economic security to the people by enabling them to earn an income besides fostering economic growth, reduction of poverty and promoting gender equality. It also helps

to develop a sense of dignity and self worth among individuals and builds social cohesion (UNDP, 2015, p.1).

Since the term labour force includes only those who are involved in paid work, it implies that some sections of the country's population who make important contributions to the national output through their involvement as unpaid family labour or domestic workers, particularly women may be excluded from the labour force (Psacharopoulos and Tzannatos, 1989). The significance of studies on women's participation in the labour force arises from this very fact that women's work and their contributions have been concealed and undervalued as pointed out by several studies (Boserup, 1970; Beneria 1982; UNDP, 1995; World Bank, 1991). In this context Beneria (1982) mentions the ideological and monetary aspects which help explain the bias in women's work. Being unpaid, the ideological aspect considers women's work as being secondary and subordinate to men's work and is reinforced by a lack of understanding of the economic role of women. The ideological bias emerges as a result of the concepts used in social sciences, concepts which need to be reconstructed so that women's role in society can be viewed from a proper perspective. The monetary aspect, on the other hand is concerned with evaluating and estimating women's work statistically since women's participation in economic activities is grossly underestimated in most labour force and national accounting statistics (Beneria 1982, p. 120).

Sundar (1981) believes that one of the primary causes of exclusion of large number of women from the workforce lies in society's outlook towards women's work and her status in society which is also reflected in national income accounts. She further adds that it is not only men's perceptions regarding women's work that leads to their exclusion, but many a time women themselves would report being not employed if they were not earning wages (Sundar, 1981). Quite often women tend to identify themselves as "only housewives" even when they are engaged in economic activities which can be attributed to cultural biases in many Third World countries (Agarwal, 1985). Given the fact that participation in home production is not regarded as being part of the labour force and that women's unpaid family labour and domestic activities are intermingled, it is difficult to make a distinction between unpaid family worker and domestic worker leading to women's non domestic work being underestimated (Beneria 1982, p. 123). According to Sundar (1981), the nature of women's work is such that a demarcation between their occupation and work for home is easier said than done (Sundar, 1981). Further, women perform multiple tasks much more than men, among which only some are remunerated (*ibid*). The lack of distinction between domestic work and unpaid family labour, particularly on family farms or enterprises makes it difficult

to empirically measure the economic contribution of women. Despite being involved in multiple tasks which include crop production, tending of farm animals, food processing and preparation, collection of fuel and water, trading and marketing etc., rural women are not regarded as being economically active (FAO, 2011, p.7) since most of these activities are not exchanged for a price or wage. Household and domestic responsibilities of women are not regarded as economic contributions albeit contributing significantly to the well being of the family and in raising the productivity of the male members. The Human Development Report, 1995 points out that if the valuation of all the “unpaid work” that women perform is done accurately, then in most societies women might emerge as the “major breadwinner” or at least “equal breadwinners” because women work for longer hours than men do (UNDP, 1995, p. 6). Further, men’s work outside the household may be considered as “joint production” since they would be unable to perform much of their work if women did not manage the households (*ibid*).

This “invisibility” and the traditional interpretations of concepts such as “work”, “economic activities”, “productivity” and “workplace”, according to Sundar (1981) is a major reason why women’s employment is not regarded as a specific category in research or policy formulation. Thus despite being important productive agents, much of women’s work is subject to economic invisibility or “statistical purdah” (World Bank 1991, p.1). Within the family, this invisibility leads to “hierarchy in gender relations” and acts as the root cause of gender inequalities (ActionAid, 2017, p. 15). The monetization of women’s non-market work is therefore not just a question of justice, but concerns women’s economic status in society (UNDP, 1995, p. 97), and the household because in contemporary society status is often determined by a person’s ability to earn income (*ibid*, p.6). It is also essential to remove the numerous disadvantages that women are subject to.

At the macro level a rise in women’s participation in economic activities is important as the realisation of women’s full economic potential will enhance the growth rate and make it more inclusive (Mehrotra and Sinha, 2017). Mehrotra and Sinha further mention that according to the calculations of the Organisation for Economic Co-operation and Development (OECD) a rise in women’s labour force participation in India with pro-growth and pro-women policies can lead to an increase in the country’s growth rate by about 2 percentage points over time (OECD 2015, cited in *ibid*). Female labour force participation or work participation has been regarded as one of the crucial tools in alleviating poverty and for attaining individual as well as familial and societal well being. As pointed out by several empirical studies it leads to reduced bias against the girl child, better health and lower levels

of mortality along with “more voice in some areas of household decision making” (Chakraborty and Chakraborty, 2009). Household welfare is determined not just by the level of household income but also by who earns that income. Agarwal (1989) notes that there is an increasing evidence of women’s earnings being spent more on meeting the family’s basic needs as compared to men’s earnings; and children’s nutritional status in poor households being associated more with the earnings of the mother instead of the father (Agarwal, 1989). Agarwal further notes that women in poor households especially in rural areas make significant contributions to family income and sometimes even greater than their husbands, where earned income is considered (*ibid*). In a study on the role of women in rural Sudan, Ibnouf (2009) notes that women have been found to be more rational compared to men in intra household allocation of scarce resources such as food and income thus ensuring household food security and maximum utility and well being of their family members. It has also been observed that expansion of women’s labour force participation, especially in activities that boost their productivity and earnings will not only improve their living standards but, over time will lead to poverty reduction, improved family welfare and lower population growth (Murty and Gaur, 2002, p. 94). The contribution of women’s labour force participation to human and economic development of a nation is thus substantial and cannot be overlooked. Further, contrary to popular belief that women in rural areas do not contribute to economic development, being confined to household work only, it is worth mentioning that women in poor rural families show higher economic participation vis-a-vis women from higher income households (Bhati & Singh,1987).

It is however noteworthy that an issue which has not gained prominence is the fact that women’s labour force participation instead of promoting women’s equality, may sometimes actually restrain it (Chakraborty and Charaborty 2009). According to Chakraborty and Chakraborty, labour force participation of women under economic stress may lead to more girl children being withdrawn from school to help in domestic and household chores and sibling care which widens the gender gap in primary education, which leads to further widening of the gender gap in labour market opportunities. This may cause women to be concentrated in low paying and marginal jobs. Similar ideas have been expressed by Srivastava and Srivastava (2010) who mention that if women work due to economic distress and in jobs which are low paying, then it may increase women’s drudgery rather than helping in their empowerment and liberation or in improving their well being and enhancing their capabilities.

The rationale for research on female labour force participation may also be understood from the fact that the factors determining the participation or non participation of women in economic activities is diverse and not easy to identify, and the factors influencing female participation rates are significantly different from those affecting male participation rates (Sundar, 1981). While men's participation is guided primarily by economic considerations having to fulfill their primary role as breadwinners of the family, women's participation may be guided by factors as diverse as demographic, social, cultural, religious, reproductive and personal apart from economic. Thus women's participation depends on a variety of economic and non-economic factors (Psacharopoulos and Tzannatos, 1989) with non-economic factors being more important for females (Sundar, 1981). According to Sundar (1981), besides the wage rate, the factors determining the female participation rate are the family cycle, structural changes in economy, cultural biases and male employment and wage rates. Pampel and Tanaka (1986) have stated family size, female education, the adult sex ratio, economic dependency and growth of labor force to be other important determinants of FLFP. As education expands, the average age of entry into the labour force may be raised leading to lower participation rates for women, although in the long run education may lead to increase in FLFP (Nam 1991). According to Mammen & Paxson (2000) women's labor market activities are determined not only by their education levels, but the education levels of their spouses. Srivastava and Srivastava (2010) have stated that although education may not have a positive impact on women's work participation, having higher levels of education leads to better quality non-agricultural work for the working women.

Several scholars have suggested a U shaped relationship between female participation and the level of economic development (Pampel & Tanaka, 1986; Psacharopoulos and Tzannatos, 1989; Goldin, 1995; Mammen & Paxson, 2000). The U shaped relationship suggests that FLFP declines in the initial stages of industrialization in low income countries as women lose traditional opportunities for work on family farm and businesses within their homes when labour becomes a market commodity. With industrial expansion therefore FLFP remains low. Later, as the tertiary sector advances FLFP also increases in advanced industrial economies giving rise to the U shape (Pampel & Tanaka, 1986).

Not only are the factors affecting supply of female labour different from that of men, but so are the factors affecting the demand for female labour. Social and cultural norms have given rise to a gender segregated labour market where there are specific jobs for men and women with women being concentrated mainly in low paying, low productivity informal sector jobs. Occupational sex-segregation- the division of men and women into different

occupations reflects severe inequalities in the labour market being accompanied by lower pay and worse working conditions in female occupations. It is found to be present in different regions irrespective of the level of development and the political systems, religions, social and cultural settings etc. (Anker, Malkas and Korten, 2003). Prejudices, social beliefs, and stereotypes regarding the fact that women are unable to perform certain types of work may be regarded as a source of gender-based segregation which directly or indirectly affects women's access to education and employment. This gender-based segregation is an important form of discrimination against women and gives rise to rigid social structures leading to long-term discrimination. It also sets in a self fulfilling mechanism where women's entry in alleged masculine jobs is initially restricted due to misperceptions which are later used to block further entry (Kulkarni and Hatekar, 2013). As a consequence of sex segregation individuals' labour market options are restricted, along with having an effect on the valuation and remuneration from work, increasing differentials in pay and reinforcing discrimination across generations (Anker et. al., 2003). Segregation may be distinguished as vertical segregation (defined as "segregation along hierarchical levels of work associated with different levels of education, experience, and skills") and horizontal segregation (which is segregation into jobs having identical educational and other qualifications, but in different areas of work) (Fortin and Huberman, 2002). Although economists have predicted a decline in vertical segregation as women attain higher education levels and experience with time, horizontal segregation persists in the long run since it is often related to attitudes regarding gender role (*ibid*). The presence of the gender segregated labour market has somewhat offset the drive towards reducing gender inequalities and has in fact reinforced the traditional gender roles as education and career choices also become biased. As men and women take up particular occupations, it strengthens the stereotypes regarding their aspirations, choices and capabilities, which further affects employers' perceptions regarding men's and women's skills and attitudes which in turn lead men and women to continue working in jobs which may be regarded as "masculine" and "feminine", thus creating a vicious circle of occupational segregation (Catalyst, 2005; KPMG et al., 2014 cited in ILO, 2016, p. 39).

1. 3. THEORETICAL PERSPECTIVE ON FEMALE LABOUR SUPPLY

Much of the discussion on employment and labour market up to the 1970s has focused on the experiences and attitudes of male workers and in many of the writings of these times labour was considered to be homogeneous and gender neutral (Manjula, 2002). The development policies until the early 1970s which followed the "welfare" approach did not consider poor

women's needs separately but in the context of women's roles as wives and mothers, since it was believed that the benefits of modernisation and growth which the macroeconomic strategies aimed at would trickle down to the poor, and that poor women would be benefitted with improvement in the economic position of their husbands (Derbyshire, 2002). As poor women's position failed to improve, there was growing dissatisfaction over the trickle-down effect. This dissatisfaction led to the basic-needs strategy being adopted with the primary focus being on increasing the participation of the poor in the development process and sharing of its benefits, along with recognition of women's needs and their contributions to society, as women's issues were brought to the forefront nationally as well as internationally (Alba, 2000, p.v). The trickle down effect was also seriously challenged by Ester Boserup in her seminal work *Women's Role in Economic Development* published in 1970, as the development projects in the Third World countries failed to automatically benefit and improve the condition of the women and other disadvantaged groups (Connelly, Li, MacDonald and Parpart, 2000, p.56). Her study brought to light the vital role that women play in society and since then women's role has been the subject of discussion in development discourse. The declaration of the United Nations Decade for Women was made in 1975 in the Mexico City conference with the theme "Equality, Development and Peace". The conference led to the emergence of The World Plan of Action and set the agenda for the Decade for Women, the aim being women's integration in the development process (Moser, 1993 cited in Connelly et. al. 2000, pp. 57-58). Perspective on women's issues experienced a major change since the 1990s with gender equality becoming an international concern. The Fourth World Conference of the United Nations on Women held in 1995 adopted the Beijing Platform for Action in which major priority areas for focused action were identified so as to achieve major benefits, which included increasing women's role in power sharing and decision making; and greater gender equality in natural resource management and protecting the environment (Commonwealth, 2001).

Though there is no such thing as a distinct "model of female labour supply" *per se*, a number of factors such as marriage, the family, and the occupational characteristics of labour supply appear to be correlated to female labour supply, and would thus be important in the analysis of female labour supply (Killingsworth and Heckman 1986, p. 126). As pointed out by Srivastava and Srivastava (2010), the reasons as to why some women work and others don't in gainful activity, either full time or part time, is varied and may arise due to a "complex interplay" of factors such as economic, cultural, social, and personal. Therefore, as mentioned by Panda (2003) besides considering the standard labour supply theories from an

individual's perspective, understanding the underlying nuances of women's labor market behaviour needs careful consideration of other factors such as "gender and familial relations, household circumstances, family resources, and cultural expectations" (Panda, 2003 cited in. Mathew, 2012, p. 20).

In the following section the dominant theories of the Neo-Classical, Marxian and Feminist framework have been examined in the context of participation of women in the labour force. As a critique to the unitary framework of the household the collective model of the household, specifically the bargaining model has also been mentioned briefly. The theories of discrimination which offer an explanation of the gender wage differentials forms an important aspect of the review of literature on women's work.

1.3.1. Neo-Classical

Income and leisure are regarded as the source of an individual's utility in the standard neoclassical theory of individual labour supply (Ratzel, 2009). In the basic neo-classical labour supply model an individual can decide between working for pay or enjoying leisure and he/she selects that combination of hours of work and leisure that maximises his/her level of utility. For individuals who are in the labour force, the opportunity cost of leisure time is the wage rate and they might choose to enter or not enter the labour force accordingly as the value of leisure time exceeds or is lower than the market wage. An increase in wage rate has two effects on the labour supply of an individual- income effect and the substitution effect. Assuming that leisure is a normal good, the income effect states that an increase in wage implies that individuals now have larger income from which they can buy more of all goods including leisure leading to reduced work. The substitution effect on the other hand states that increased wages lead to greater returns from work and higher opportunity cost of leisure in terms of the income forgone by not working, thus leading to a substitution of leisure for work. If leisure is a normal good, as wage rates rise more labour will be supplied if substitution effect is stronger as opposed to the situation where the income effect is stronger (Benjamin, Gunderson and Riddell, 1998). A person's labor supply curve will be positively sloped if the substitution effect dominates and negatively sloped if the income effect dominates. It is difficult for economic theory to predict which of the two effects would dominate, and in reality, the individual labour supply curves could be positively sloped and negatively sloped for different ranges of wage (Ehrenberg and Smith, 2012).

Quite often economists use the concept of a reservation wage in analyzing labour force participation behaviour. An individual compares the market wage rate and the reservation wage, defined as the wage rate at which an individual would be indifferent

between participating in the labour market and engaging in non-labour market activities such as household work, leisure etc.; and decides to participate or not to participate in the labour market accordingly as market wage rate exceeds or is below the reservation wage (Benjamin et. al., 1998). According to Sultana, Nazli, and Malik (1994), the market wage and the reservation wage for women are determined by different socio-economic characteristics such as male and female wages, age, education, and non-wage income which all affect the labour supply decision (Sultana, Nazli, and Malik, 1994).

Neo classical theory did not pay attention to gender issues; nonetheless the increased participation of women in the labour market since the seventies led the neo-classical theory to consider the labour market activities of women (Mathew, 2012, p .22). Men and women have different preferences due to which they make different decisions in similar situations (Atal, 2017) which implies that women's labour supply decisions differ from those of men. Further, the labour supply decisions of a woman cannot be taken by her alone and all adult members, particularly adult males of the household would typically participate in such decisions (*ibid*). The important determinants of level of and trends in women's labour supply are family membership and its obligations (Killingsworth and Heckman 1986, p. 126). It is therefore important to understand the household's decision making process to study the female labour supply behaviour (Atal, 2017).

The conventional family labour supply model, also called the unitary approach is an extension of the analysis of a single individual. The model postulates the family or the household as the elementary decision making unit where consumption and labour supply decisions are taken by the household as a whole (Killingsworth and Heckman, 1986 p. 126; Donni, 2005) The household choice is presented as a result of maximisation of a single aggregate utility function subject to the constraint that the total family income may not exceed the family's total expenditure on the consumer good (Killingsworth and Heckman, 1986, p . 126 ; Myck and Reed 2005, p .20). The use of the family utility function is justified on the following grounds- first, the family members conform to the preferences of the family head; second, existence of social (i.e. family) utility function ; and third, family members "care" for one another (Killingsworth and Heckman, 1986, p . 131). The members of the household may however, not conform to the preferences of the household head which is an important criticism of the unitary model. The unitary family models have also been criticised primarily for neglect of issues like intra household inequalities in decision making which resulted in the formulation of alternative theories of the household i.e. the non-unitary models of the household which will be discussed in a later section of the chapter.

Neoclassical theory distinguishes clearly between the theory of production and consumption with production being undertaken by profit-seeking firms and consumption by utility-maximizing households (Gronau, 1986 p. 274). The distinction however became somewhat blurred in the mid 1960s (*ibid*, p. 274) with the popularization of the “new household economic theory” of Becker which claimed that households are not merely places of consumption but also places of production (Wiro, 1999). Beckers’s ideas were nevertheless not completely new as importance of household production was mentioned by others before him (*ibid*). Charlotte Perkins Gilman (1898) is one of the earliest persons to write on household production. Gilman questioned the traditional gender division of labour and proposed that household production needed to be marketed so as to gain more from greater specialisation and economies of scale, which would also make it possible for women to select their work according to their preference and talent (cited in Ironmonger, 2000). Heckman (2015) mentions the works of Mitchell (1912) who made a comparison between firms’ efficiency engaged in production of goods for the market and the households’ inefficiency in production of services within the domestic sphere, Kuznets (1934) who expressed concern about the exclusion of key components of household production from GNP accounts, and Reid (1934) who wrote a textbook on home production for students of home economics which provided important insights regarding the household and women’s role (cited in Heckman, 2015). Reid (1934) mentions that the importance of household production has been neglected mostly due to the reason that the household is not a money-making institution since the component of the economic system which is not organized on a profit basis tends to be overlooked (Reid, 1934, p.3). Unfortunately Gilman and Reid failed to significantly affect mainstream economic theory regarding household production, and households continued to be regarded as places of consumption and leisure with production of goods and services occurring outside the household (Ironmonger, 2000).

According to the theories of household economics initiated by scholars such as Mincer (1962), Becker (1965), Cain (1966) and Gronau (1977) female labour force participation was explained in terms of household characteristics (cited in. Mallika, 2011, p. 23). Becker’s “new household economic theory” is the most complete presentation of the unitary household model in which Becker considers family to be the primary societal institution (Wiro, 1999). Although development of the New Household Economics is considered to be largely due to Becker, Mincer (1962) played a pertinent role in inclusion of female labour force participation of women within economic theorizing through his analysis of the increasing labour force participation of women during the time of rising family

incomes in the United States (Mathew, 2012, p. 22). The study of household economics is closely linked to gender issues, mainly the work and status of women within the family and the household (Wiro, 1999).

The analytical foundations for studying household production and the time allocation within the household was laid in Gary Becker's classic study, *A Theory of the Allocation of Time* (Heckman, 2015). Becker's (1965) pioneering study of time allocation introduced time as an additional commodity in the utility maximisation process within the household. The household production model postulates that households rather than being only consumers are producers as well producing commodities as per the neo-classical theory of the firm on the basis of cost-minimisation rules. The theory also suggests that besides efficiently allocating time among commodities, family members also allocate time among themselves so that members who show relatively more efficiency at market activities would spend less time at consumption activities than other members (Becker, 1965). This division of labour within the family may be used to explain the participation of women in the labour market as Becker opines that given the fact that even with similar investments in human capital "if women have a comparative advantage over men in the household sector", then efficient households with both men and women would allocate women's time chiefly to the household and men's time to the market sector (Becker, 1981, p. 38). However, as pointed out by Gronau (1977) Becker's theory does not actually concern household production since the theory does not make a distinction between women's household activities such as cleaning, shopping and other household chores and leisure activities (Gronau 1986, p. 282). Gronau (1977) further states that Mincer (1962) may be regarded as the first to point out that a distinction should be made between work at home and leisure at least in the case of women which was absent in Becker's more general formulation (*ibid*) since according to Mincer (1962) a better part of women's married life is devoted to "work at home" (Mincer 1962).

The labour supply of married women has been analysed by several economists including Mincer (1962) and Cain (1966) (Devi, 2002, p. 17). Mincer (1962) formulated a model for understanding the labour force behavior of married women in which he considers "the relevant choices for married women as between leisure, work at home and work in the market" (Mincer, 1962). He postulated that the male income and female wage rate explained half of the observed variation in the labor force participation rate (in per cent) of married women during the 1950s in 57 largest Standard Metropolitan Areas in USA, with the effect of husbands' income being negative and wives' earning power being positive (*ibid*). Besides considering a variety of essentially static topics, Mincer's analysis also included dynamic

features such as the notion of life-cycle decision making and the distinction between permanent and transitory components of income, earnings, wages etc. (Killingsworth and Heckman, 1986, p. 145). According to Cain (1966) women's decision to join the labour force was not as strongly determined by wage as proposed by Mincer (1962) (cited in Patel, 2012). Nevertheless, it was still stronger compared to the proportion of wife's earnings in family income, with other important determinants being market wage rate for other family members and number of young children in the household which had a negative effect on women's labour force decisions (*ibid*).

One of the chief criticisms of the traditional neo-classical labour supply model is that it does not investigate the different ways in which time outside work may be spent, which may be either in consumption or production, the latter also being referred to as unpaid work. Despite the two activities being different from each other, household production activities are generally included within the neo-classical concept of "leisure" which leads to the assumption that substitutability between market work and household consumption is similar to the substitutability between market work and household production (Stoep, 2008). Another criticism of the neo-classical model is that time allocation of members of the household cannot be taken independently of the decisions of other individuals in the household (*ibid*). Further, the lower labour force participation of women is justified in the neoclassical model according to the principles of efficiency, specialisation and optimal household resource allocation (Mathew, 2012, p. 24).

The neo-classical theories try to explain the complex behaviour of households in terms of the theories of consumer behaviour, market and firm by creating an analogy between the household and the firm. In doing so, the theories fail to take into account many activities which are not exchanged in the markets i.e. household production (Wiro, 1999) thus omitting a substantial portion of women's household work. As mentioned by Beneria (1995) household production and women's work received little economic importance in the New Household Economics since it applied market-oriented criteria to time allocation, the division of labour and individual choices regarding labour force participation (cited in Mathew, 2012). The non-work time which includes household work (the time not spent at market work) represents a loss of earnings in the neo-classical framework and is therefore undervalued (Wiro, 1999).

1.3.2. Marxian

Although there was no systematic theory of gender in Marx's writings and his writings on gender and the family are found scattered throughout his work, they are of far greater

importance than is acknowledged as it leads to an understanding of the division of labour, production and society in general (Tomanovsky, 2010; Brown, 2012, p.3). Marx's views on women's position in the workforce were more nuanced than is acknowledged by feminists (Tomanovsky, 2010). It may be said that as far back as 1844, in his *Economic and Philosophical Manuscripts*, Marx put forth an argument that women's position in society could be used to gauge development of society as a whole though Marx was not the first to make such a statement (Brown, 2012, p.212). In analyzing women's position, most Marxists consider women's relation to the economic system, rather than women's relation to men, with the assumption that the relation between men and women will be explained in their discussion of women's relation to the economic system. They also view women's oppression in connection to production (Hartman, 1979, p. 2). While analyzing social inequalities and exploitation, and relations of domination such as racism and sexism, Marx also draws attention to the social relations of work in different economic modes of production (Ferguson, Hennessy and Nagel, 2016).

Most of the scholars of the Marxist school accepted Friedrich Engels' argument that private property and capitalism led to women's subordination, therefore a change in gender inequities required a successful class struggle and the termination of the capitalist system (Connelly et. al., 2000, p. 59). In his renowned book *Origins of the Family, Private Property and the State*, Engels acknowledged and attributed women's subordinate position in society to the institution of private property (Engels, 1972 cited in. Hartman, 1979 p. 3) and believed that women's emancipation was possible through their participation in the labour force (*ibid*). The early Marxists including Marx, Engels, Kautsky, and Lenin believed that in capitalism women were drawn into the wage labor force which led to the destruction of the sexual division of labor (Hartman, 1979, p.2). Marx notes that the spread of capitalist production to places where domestic industry previously operated, led to dissolution of the family and erosion of the power of the household head as women and children now entered the labour market to support the family instead of just the father (Brown, 2012, pp. 92-93). Capitalism, according to Marx and Engels, removes women and children out of the domestic sphere making them available for work which was traditionally carried out by men, with women and children producing the same value but being paid less than men though they do not point to the reasons for this difference (*ibid*, p.57). With their entry into the workforce, women gained more power in their private lives since they started making monetary contributions to the welfare of the family and were not controlled directly by the male members of the household i.e. husbands or fathers during the larger part of the day (Tomanovsky, 2010). According to

Hartman (1979), Marxists were fully aware that although women's participation in the labour force made them economically independent and led to their emancipation, this meant more hardships for them in having to do two jobs-household and wage work (Hartman, 1979, p.3). Capitalist development and women's entry into the workforce was therefore, two sided. While on the one hand it led to a transformation of the family structure from a "feudally based form to a bourgeois one" where "profit and egoistic interest" gained dominance; on the other hand the dissolution of the "feudally-based patriarchal family" created the necessary settings for the formation of a new family structure where women would no longer be considered inferior, although a detailed transformation of the family was not discussed by Marx (Brown, 2012, p. 97). Marx believed that for advancing beyond capitalism, new social relations need to be formed and development needs to be achieved upto that point where people would be valued for who they are rather than for being a man, woman, child etc. (*ibid*, p.212).

Contemporary theorists like Balbus, Baudrillard, and Sahlins argue that Marx's theory gives primacy to production which implies that the nature, origin, and development of the family, gendered division of labor, male domination, and all other similar and related matters can be explained and determined by economic conditions (Kain, 1992). Kain further argues that over emphasis on "productivism" causes Marx to undermine the importance of several fundamental non economic and non productive traditional activities of women which have been omitted from economic production. These include women's activities in the family and in reproduction. Further, this also means that women's oppression is regarded as just another aspect of economic oppression, along with neglect of the fact that women's oppression continues to be related to non economic factors even in modern capitalist society. Chattopadhyay (2001) mentions that, Marx distinguishes between 'abstract' labour, which is the exchange value producing labour, and 'concrete' labour which is the use value producing labour. In capitalist production only wage labour is regarded as 'productive labour' since by exchanging itself, it not only reproduces itself but also produces a surplus value. On the other hand, unpaid domestic labour producing use values and paid labour performed outside the home such as cooking, sewing, gardening along with the activities of the menial servants, activities of state servants, advocates, doctors, scholars etc. are regarded as unproductive labour under the capitalist system since they are simply "personal services exchanged against income" (Chattopadhyay, 2001). Marx however did not "neglect women's labour" as he emphasises that before becoming wage labourers women performed "labour necessary for

family consumption,” which had “economically sustained the family way of life” (Chattopadhyay, 2001).

In the context of Marxist theory it is also worth mentioning the concept of the reserve army of labour. According to Marx, as labour is replaced by machines through capital accumulation during the process of capital development, there is emergence of the reserve army of labour. Though women were not considered in the reserve army of labour, they can be identified with it due to their disadvantaged position in the labour market. Since they belong to the most volatile section of the labour market, they can be removed from their jobs easily with capitalist development (Devi, 2002, p. 20).

Women’s position in the Marxist paradigm has always been seen as the product of capitalism, and gender relations are not analysed autonomously but subsumed under the analysis of class relations (Kalpagam, 1986 cited in Mathew, 2012, p. 29). According to Brown (2012) feminists criticize Marx and Marxism for according primary importance to production at the expense of consumption and reproduction, which are traditionally women’s tasks, to such an extent that women’s non procreative household work is considered to be outside the market and outside production altogether (Brown, 2012, p. 66). Benston (1969) argues that women need to be treated as a separate class of workers as the work they do is different from those done by men, and that women’s unpaid reproductive work, household labour and childcare- socially necessary forms of labour but viewed as less valuable under capitalism needs to be brought into the public sphere and valued in the same way as other forms of labour to remove discrimination against women (Benston, 1969 cited in Brown, 2012, p. 68). It may therefore be said that Marx’s theory is not well developed in terms of providing a proper account to understanding capitalism by including gender (Tomanovsky, 2010).

1.3.3. Feminist

Though there are several schools of feminist thought, they are bound by one common thread- that of removing the historically disadvantaged position of women in society and bringing about equality of men and women. The feminist theory argues that patriarchy or male domination exists in all societies and is the primary source of inequality, and that women’s position in the labour market is governed by patriarchy (Devi, 2002, p. 19). While Marxist and socialist feminists consider capitalist system of production and the resultant division of labour of the system to be the root cause of gender inequality and women’s oppression; radical feminists regard patriarchy to be the prime cause of men’s domination of women, wherein patriarchy is not a product of capitalism or any other social structure (Freedman,

2001, p.5). The feminists are concerned with enquiring into the causes of gender inequality, and of men's dominance over women (Hartman, 1979, p.2).

Since times immemorial, the different social roles assigned to women and men have been explained and justified according to their biological differences with women's roles being confined to domestic chores, child rearing and in activities requiring lesser physical strength as they were considered not fit for participation in the public sphere (Freedman, 2001, p.12). Being natural providers men participated primarily in activities outside the household i.e. the public sphere. This link between physiology and a 'natural' differentiation in gender roles was questioned by the feminists; the answer lying in a distinction between physiological "sex" and social "gender" or between the terms "female" and "feminine" (*ibid*, pp.12-13). Sex, as the term is generally used in feminist literature, refers to "biological differences between males and females", while gender "refers to the associations, stereotypes, and social patterns that a culture constructs on the basis of actual or perceived differences between men and women" (Nelson, 1995). Thus while sex is natural, gender is a result of socially constructed ideologies regarding men's and women's roles and behaviours etc. Gender ideology confined women within the "private sphere of the family" while men could operate in the "public sphere of the market" (Jennings, 1993 cited in Barker, 2005) with the activities performed in the household i.e. reproductive labor, being classified as economically unproductive (Folbre 1991, cited in Barker, 2005). The differentiation of men's and women's work thus placed women in a position lower to that of men.

Upto the 1960s, women's traditional labour was subsumed within the "blackbox" of the family within the framework of neoclassical economic theory, and studies conducted on paid labor considered only men and excluded women's household production from national accounts making women, their traditional activities, their well-being and the well-being of children invisible (Nelson, 2005a). The studies on household production upto that time along with the pattern of labor market led to the emergence of feminist economics as we know it today during the 1970s (*ibid*). Feminist economics challenges economic theories that regard women as being invisible, or reinforce women's oppressive situations and includes both studies of gender roles in the economy from a liberatory perspective, and critical work aimed at removing the biases in the subject matter and methodology of economics as a discipline (*ibid*). Mainstream economic theory is primarily concerned with the exchange of goods, services, financial assets etc., which implies that most of the non-market or unpaid activities of women within the household such as caring for children, sick and elderly etc. have been considered "non economic" and omitted from the field of economic research (Nelson, 1995).

Women's household activities were classified as "leisure" leading to exclusion of household production from national accounts (Nelson, 2005a). Through gender analyses feminist economists have revealed that "masculinist values" are deeply rooted in mainstream economic theorizing and have brought to light the asymmetries in economic theories and policies (Barker, 2005). By examining economics through the feminist lenses the feminist school criticised several neoclassical assumptions such as joint utility, altruism etc along with the concepts of patriarchy and class interest of the Marxist theory (Mathew, 2012, p.30). According to Zimny (2014), the feminist critique of mainstream economics is that mainstream economics is not gender neutral as it claims, but has an inherent gender bias which leads to women's discrimination economically and socially (Zimny, 2014).

Feminist critique of neoclassical economics, which gained momentum during the 1980s, was partly a result of the increasing dissatisfaction with mainstream theory regarding treatment of women's issues such as invisibility of women's traditional work, justification of the breadwinner/homemaker gender roles etc., and partly as a result of riding on "coattails of 1980s feminist research on the history of science" (Harding, 1986; Keller, 1985 cited in Nelson, 2005b). Mainstream economics was mostly concerned with analysis of the individual with little or no importance given to the family. The development of the theories of "new household economics" developed by Becker (1965), Mincer (1962) and others during the 1960s analysed household production and added a gender perspective to household decision making. Nevertheless they failed to fully incorporate women's economic contributions since they were working under the assumptions of the neo-classical framework (Zimny, 2014). On issues of labor market discrimination, unpaid household work and intra-household decisions, work by economists provided justification for traditional gender roles, occupational segregation, and lesser earnings of women in the paid labor market on the basis of dissimilarities between men and women arising out of the natural differences between them in tastes and capabilities often expressed in varied choices in human capital formation (Nelson, 2005a). Feminists have criticised the neoclassical approach for treating the household as a homogeneous decision making unit independent of "power relations, authority and hierarchy" and also for treating the household as an isolated unit, "independent of social pressures, norms or values" which is generally not the case (Sen and Sen, 1985). Although the Marxist tradition paid some attention to women's work, they have traditionally only been of marginal interest in the main development of the theory (MacDonald, 1984, pp. 154-155). Feminists have criticised the notions of patriarchy and class interest of the Marxist paradigm (Mathew 2012, p. 30) mentioning that patriarchy led to women's oppression irrespective of

their class status or mode of production-socialist, capitalist or feudal (Beneria 1979; Hartmann 1979; Folbre 1982 cited in Barker, 2005). Marxist economics is disappointing for feminist economic research since it lays more emphasis on class relations rather than gender relations and also carries out most economic analysis without referring to women (MacDonald, 1984, p. 155).

According to Barker (2005) feminist economics is primarily concerned with gender analyses of women's work. Barker (2005) mentions that liberal feminist economists like Boserup, Bergmann etc. argued that freedom of women from drudgery and subordination at home requires expansion of wage labour through higher participation of women in paid economy and the commodification of household labour traditionally assigned to women. Socialist feminist economists regard reproductive labour (i.e. cooking, cleaning, and caring for children, partners, the infirm, and the elderly) as being distinctly different from productive labour (i.e. the paid labor that produces goods and services such as food, clothing, and shelter for sale in the market) and expressed the importance of but overlooked the fact that unpaid work performed within the household was essential for social reproduction. The point of agreement among the feminist scholars however, is the fact that women's subordinate role in the economy is a consequence of their participation in household activities and that an improvement in women's secondary status in paid labor markets requires sharing of domestic work between women and men (Beneria and Sen 1981, 294 cited in Barker, 2005). Besides establishing the fact that reproduction of labor-power requires a wide range of activities than simply the consumption of commodities, feminists recognised the importance of reproduction and women's domestic labor for capital accumulation which led to a rethinking of Marx's categories, and a reunderstanding of the history and fundamentals of capitalist development and the class struggle (Federici, 2009).

Feminist economics, therefore, by including the gender perspective has made important contributions in economic analyses regarding measurement and valuation of women's unpaid work, labour market discrimination, occupational segregation, intra household allocation of resources and decision making etc. Through a deconstruction of androcentric theories and knowledge feminists have provided an inclusive understanding of the multiple realities which women face, which have provided a basis for criticizing the existing policies and formulating alternative ones to address the needs and problems of women (Bailey, Leo-Rhynie, and Morris 2000). Barker (2005) advocates using gender as a conceptual rather than an empirical category in further research in feminist economics.

1.3.4. Bargaining Models

The family labour supply model of the neo-classical theory postulates the family or the household as the elementary decision making unit that maximises a single aggregate utility function subject to the budget constraint. Becker's "new household economic theory" is the most complete presentation of the unitary household model. The unitary framework nevertheless treats the family as a "black box" –no attention being paid to the dynamics of intra household decision making. In its given form the theory may be considered to rely on one of two implicit assumptions, that the decision function of the household is dictatorial reflecting the preferences of its "head", or that the members of the household have identical preferences and choices are unanimous (Lancaster, 1975). Another rationale for the family utility function is based on intra family resource allocation and assumes that family members "care" for one another so that the conflict between the utility functions of different members of the family are eliminated through transfers between them (Becker, 1974 cited in Killingsworth and Heckman, 1986, p.131). In the unitary model therefore the household is considered to be a "harmonious unit with an altruistic patriarch" who ensures the well being of all the members (Wiro, 1999). Although Becker's model emphasises on the concept of altruistic behaviour, Chowdhury (2005) points out that many studies doubt the accuracy of his model because it does not correctly reflect women's individual and collective experience. The studies reveal that all over the world women may be discriminated within their families, e.g. women, more often than men are likely to suffer more from malnutrition in times of famine, and receive less household income without being compensated for leisure time (Chowdhury, 2005).

Economic theory does not justify the transformation of individual utility functions into the family utility function (Myck and Reed, 2005) since a household constituting several adult members cannot be expected to "behave as a single rational agent" (Donni, 2005). Wiro (1999) cites Fortin and Lacroix (1997) who claim that evaluation of preferences of the individual members of the household may not always be possible within the unitary model (cited in Wiro, 1999). It has been argued by (Folbre 1986) that joint utility functions do not take into consideration the fact that there may be any intra household inequalities in access to resources and sharing in the benefits of production although in reality the situation may be different (cited in Chowdhury, 2005). Galbraith (1974) states that in neoclassical economics the problem of non expression of individual personality and preferences by the household members is resolved by ignoring the subordination of the individual (mainly women) and the intra household relationships (cited in Wiro, 1999). Myck and Reed (2005) mention that

actual empirical data do not support the implications of the unitary model and that family labour supply decisions are much more complex than individual labour supply decisions, as they include factors such as decisions to marry, separate, timing of children, etc. (Myck and Reed, 2005).

As mentioned by Lundberg (2005) economists have suggested several alternatives to the unitary framework which include non-cooperative bargaining models (Lommerud, 1997; Lundberg and Pollak, 1994), cooperative bargaining models (McElroy and Horney, 1981; Manser and Brown, 1980; Lundberg and Pollak, 1993), and a “collective” approach that assumes couples jointly choose an efficient outcome on the utility-possibilities frontier (Chiappori, 1988, 1992) (cited in. Lundberg, 2005) with the common factor in all the approaches being that they consider preferences of individual family members, rather than a family utility function (Lundberg, 2005). The collective models consider the differences in the preferences of the household members and the conflicts and inequalities that may arise among them giving importance to individuality rather than the joint decision making process (Wiro, 1999). In the bargaining models of family behaviour (e.g. Horney and McElroy (1978), Manser and Brown (1979, 1980), McElroy and Horney (1981)) the decisions of individual family members were treated in game theoretic terms (cited in. Killingsworth and Heckman, 1986, p. 133). The bargaining problem was initially formulated by Nash who provided a corresponding bargaining solution which could be applied to relationships like marriage (Chowdhury, 2005) by applying the tools of game theory (Wiro, 1999). The bargaining models can be used in the analyses of marriage and divorce also as they consider alternatives to marriage as well as behaviour within the family (Killingsworth and Heckman, 1986, p. 133).

Bargaining models may broadly be classified as “co-operative” and “non co-operative.” The simplest form of a bargaining problem considers co-operation between two people so that each one’s position improves compared to a situation in which there is no cooperation between them (Sen, 1985 cited in Wiro, 1999). An important feature of Nash bargaining models is the presence of a threat point for each household member which is the reservation utility i.e. the utility obtained outside the household in absence of co-operation. Co-operative bargaining models based on Nash bargaining framework suggest that the bargaining power of the family members is determined by a person’s fall-back position, also known as the “threat point” or “outside option” with an improvement in the person’s fall-back position (better outside options) leading to an improvement in the person’s bargaining within the household (Agarwal, 1997). The non co-operative models relax many assumptions,

including those of Pareto-efficiency, income pooling, and enforceable and binding contracts (*ibid*) and each household member maximizes his/her own utility subject to an individual budget constraint, considering the decisions of other household members as given (Rode, 2011). The absence of a pooled budget constraint is an important characteristic of the non co-operative models (*ibid*). The non-cooperative models may have multiple equilibria, which may or may not be Pareto efficient.

Within the bargaining approach, however, intra household interaction may contain elements of co-operation as well as conflict (Agarwal, 1997). Wiro (1999) points out that Sen (1987) regards bargaining problems as a special category of co-operative conflicts. According to Sen (1987) household members are confronted with two problems simultaneously, one concerning co-operation and the other conflict, and these in turn determine social arrangements such as the sexual division of labour, who consumes what, and who makes which decisions (cited in Wiro, 1999). The underlying conflict which may arise between those co-operating is due to the fact that among the set of co-operative outcomes among the household members some outcomes may be favourable to one group and unfavourable to others (Agarwal, 1997). Which outcome will emerge depends on the relative bargaining power of the household members which may be determined by several factors, in particular the strength of a person's fall-back position which, according to McElory (1990), depend on extra-household environmental parameters (EEP) such as parental wealth, a person's nonwage income, and the legal structures regarding marriage and divorce (cited in Agarwal, 1997) and may have a distinct gender dimension. Chowdhury (2005) notes that according to Dreze and Sen (1995), women's relatively weak bargaining power depends on their relative capability deprivation since their ability to exploit opportunities such as improving their human capital is inhibited by such deprivation, besides preventing them from controlling their own lives and taking their own decisions (cited in Chowdhury, 2005). Moreover, women's bargaining is limited to certain areas of decision making (*ibid*). The model also ignores situations where although bargaining may be allowed, it does not lead to long term advantage of the weaker member.

The bargaining models are better than the unitary models because they take into account individual preferences of the household members and the existence of conflicts or inequality among them. The nature of intra-household decision making is also considered and the existence of multiple utility functions within one household instead of a joint utility function is also recognised. In doing so, the bargaining models add a gender perspective in

household functioning by focussing on disproportionate gender relations within the household.

1.3.5. Theories of Discrimination

An important aspect related to participation of women in the labour market is the inequality in men's and women's wages and discrimination between them. The neo-classical theory can be used to explain the gender differentials in wages in the labour market in terms of the human capital theory and the theory of discrimination. Becker who popularised the term "human capital" defines it as "activities that influence future monetary and psychic income by increasing resources in people" (Becker, 1991, 11 cited in., Teixeira, 2014), with its main forms being schooling and on-the-job training, although other factors such as medical care, migration, and searching for information about prices and incomes are also considered (Teixeira, 2014). The theory suggests that the differences in human capital which is influenced by the decision to invest in human capital, the criteria being the returns to investment, causes differences in productivity and earnings among people, with people having more human capital being more productive and earning more as compared to people with low human capital (Mathew, 2012, pp. 24-25). Recognizing the fact that the incentive to invest in human capital specific to a particular activity is positively related to the time spent at that activity (Becker, 1964 cited in Becker, 1981, p. 57) a number of studies (Oaxaca, 1973; Mincer and Polacheck 1974, cited in *ibid*) have explained the lower earnings of married women in comparison to married men due to their lesser participation in the labour force (*ibid*). Since neo-classical theory expects women to spend more time in household activities and men in market activities, women invest mainly in human capital that raises household efficiency, especially in bearing and rearing children and men mainly in capital that raises market efficiency (*ibid*, p.39). Therefore, women's investments in human capital in terms of the education they receive and the skill they acquire are much less which leads to their lower productivity and participation in jobs which are less remunerative (Mathew, 2012, p. 26). The male-female wage differentials are thus explained on the basis of differences in investment in human capital based on the traditional gender roles and gender division of labour.

Gender wage differentials can also be explained in terms of the theories of discrimination. The neoclassical approach to discrimination, according to Boyer and Smith (2000), went through at least three generations with important contributions from Alfred Marshall, John Hicks, Paul Douglas, H. Greg Lewis, George Stigler, Jacob Mincer and Gary Becker (cited in Chakraborty, 2016). Becker (1957) may be regarded as the pioneer of the

modern study of discrimination in neo-classical economics through his formulation of the “taste” model in which he argued that there may be a “taste for discrimination” on the part of the employers, workers or customers who may prefer not to hire, work with or buy from a particular group (*ibid*). In the context of gender, it may imply not having a preference for or simply disliking or refusing to work with someone of the opposite sex, with the result that customers are willing to pay a price for this discrimination (Calaway, 1999). Discriminating employers will therefore pay lower wages to women which may help explain the gender wage differentials. The theory suggests that competition will however, eliminate discriminators in the long run as laws would be formulated which would make discrimination costly and employers would be discouraged from practising discrimination (Drydakis, 2018).

Discrimination, in neo-classical theory may also arise due to imperfect information which leads to “statistical discrimination” (originally proposed by Phelps, 1972) (Calaway, 1999; Chakraborty, 2016). The theory of statistical discrimination suggests that employers use group averages for predicting individual characteristics and productivity, to set corresponding wages which also proves to be cost-effective (Drydakis, 2018). However, this may lead to incorrect predictions regarding workers’ productivity (*ibid*) as all individuals belonging to a particular group may not always exhibit the average group characteristics. Imperfect information may therefore lead to individuals being discriminated against by virtue of being members of the broader group and believed to share some undesirable, stereotypic characteristics of the group (Calaway, 1999). In the context of women, assuming that women have a lower expected employment life as compared to men, many employers may not provide similar opportunities to men and women such as firm-specific training, job assignments, or promotion (*ibid*) and thus discriminate against them which results in women’s lower productivity and lower earnings.

The gender wage differentials may also be explained in terms of the crowding hypothesis formalised by Bergmann (1971) (cited in Olson, 2007). The hypothesis which postulated that blacks were discriminated against and excluded from jobs reserved for whites despite having similar education and qualifications, led to them being overcrowded into few jobs reserved for them resulting in their lower wages (*ibid*). Bergmann (1974) argues that women’s exclusion from alleged “male” jobs leads to women being in excess supply in alleged “female” occupations, which leads to a lowering of wages in female jobs (cited in Blau and Kahn, 2005) due to demand-supply mismatch. Bergmann argues that the job segregation by gender is rooted in history, tradition and misogyny which leads to exclusion of women from jobs that would make them equal or superior to men causing overcrowding of

women into a limited number of jobs defined as female (cited in Olson, 2007). Since women are expected to be caring and nurturing, they tend to take up those jobs which emphasize these feminine characteristics causing crowding in these jobs. Although it may be argued that crowding could be the result of differences in tastes and preferences between men and women, for women who do not prefer the traditionally female occupations crowding may be regarded as a form of discrimination (Calaway, 1999). Besides lowering the wages in occupations traditionally held by women, crowding also lowers women's pay in jobs where both men and women or mostly men participate, and prevents women from accumulating human capital and experience which allow them to earn better wages reducing women's overall productivity and efficiency (Bergmann, 2005 cited in Olson, 2007).

1.4. GENDER ROLES IN AGRICULTURE AND MOUNTAIN FARMING

1.4.1. Gender Roles in Agriculture

According to the World Development Report 2008, three out of every four people in developing countries live in rural areas, and most depend on agriculture for their livelihoods. Thus even in the 21st century, agriculture continues to be an important source of livelihood for the majority of the rural population and can make substantial contributions to economic growth, poverty reductions, food security and sustainable development in countries where it is the primary occupation of the people (World Bank, 2007 p.1). There is no denying that growth in the agricultural sector paves the way for effective reduction of poverty and accelerating economic growth (Dixon, Gulliver and Gibbon, 2001, p. 3). According to Mellor (2000), this can be achieved through an increase in incomes of farmers-producers and workers, and also by creating demand for non tradable goods, viz. locally produced goods and services (cited in *ibid*, p.3). It is further mentioned that poverty reduction is mainly achieved through this indirect effect on demand and the subsequent employment generation in the non farm sector in the rural areas and the market towns (*ibid*). Dixon et. al. also mention other studies (Dhatt and Ravallion, n.d.) which show that the urban sector also benefits significantly from agricultural growth as urban food costs decrease and migration to urban centres is also cut back, thus reducing the rates of urban poverty (cited in, *ibid*). Although agriculture alone would be insufficient in reduction of mass poverty through achievement of food security, it has been considered to be most “uniquely powerful for that task” (World Bank, 2007 p.1). Nonetheless, it needs to be accompanied by other measures which lead to broader access to food viz. provision of public goods, research, extension and education for which the role of the public sector becomes crucial (Dixon et.al., 2001, p. 4).

The discussion on women and agriculture may be initiated with the definition of the agricultural labour force. The Food and Agriculture Organisation (FAO) (2011) defines the agricultural labour force to include all those “who are working or looking for work in formal or informal jobs and in paid or unpaid employment in agriculture”, and “includes self-employed women as well as women working on family farms”, and excludes “domestic chores such as fetching water and firewood, preparing food and caring for children and other family members” (FAO, 2011, p.7). Thus women in agriculture includes all the women who contribute to agricultural production either by working on their own farms or as wage labourers on others’ farms and by participating in food production and other allied activities such as rearing of livestock, poultry, fish farming etc. both for subsistence or commercial purposes.

Historically, women are known to have had a greater involvement in agriculture as pointed out by M. S. Swaminathan, the famous agricultural scientist, that according to some historians women were the first to domesticate crop plants and initiate the art and science of farming. While men were engaged mainly in hunting and searching for food, women gathered seeds and started their cultivation for food, feed, fodder, fibre and fuel (cited in Research Foundation Science and Technology, 2005). It is a well known but unrecognized fact that women play a significant role in agricultural activities through their role as cultivators, family labour, agricultural labourers and entrepreneurs. However development policies’ failure to recognize them as farmers leads to them being denied access to productive assets such as land, credit, extension services etc. partly leading to the underperformance of the agricultural sector in many developing economies. Identifying the constraints that women face in agriculture and taking steps accordingly to close these gender gaps in access to productive assets will go a long way in improving the position of women in agriculture and will also accelerate the pace of economic growth and poverty reduction that agricultural development promotes, along with ensuring food security (FAO, 2011, p. 3). If female farmers’ positions are strengthened, the well being of the family in terms of “improved nutrition and care of children, especially girls” is enhanced since women allocate more of their income on household expenditure than men (Rao and Gulati, 1994).

According to the latest estimates of the International Labour Organisation (ILO), 27 percent of females in the world were employed in agriculture in 2017 although the percentages have been showing a steady downward trend. The percentages vary from about 8 percent in Latin America & Caribbean, and Europe & Central Asia to about 22 percent in East Asia & Pacific, 24 percent in Middle East and North Africa, 57 percent in Sub Saharan

Africa and 59 percent in South Asia. Among the South Asian countries the percentage of women employed in agriculture is as high as 83 percent in Nepal with the percentage for India being about 56 percent (ILO, 2017). However, women's roles and status in agriculture and rural areas vary widely across region, age, ethnicity and social class and are undergoing rapid changes in some parts of the world (FAO, 2011, p. 4).

Division of labour in crop production has been reported by several studies (Boserup, 1970; Stone, Stone and Netting, 1995; Mollel and Mtenga, 2000; Gurung and Gurung, 2002; Shimray, 2004; Ishaq & Farooq, 2006). However, the nature and extent of it differs from one society to another (Mollel & Mtenga, 2000). Gender roles in agriculture vary widely across different countries, regions, ethnic groups, cultures, socio economic status and across different crops and farming systems. According to Gurung and Gurung, (2002) gender roles in agriculture are generally determined by the traditional concepts of culturally appropriate work for women and men, which are based on the concepts of masculinity and femininity leading to a distinction between the concept of indoor work and outdoor work. In their study of a village in a district in eastern Nepal, Gurung and Gurung report that men's work is primarily outdoor involving activities such as ploughing, clearing land for swidden, planting, and harvesting; while women's work is within the home or domestic space and is associated with femininity and indoor work such as caring for the family, cooking, etc. along with seed management, an important agricultural activity that is considered indoor work. However, Chowdhury's (1993) study of women in rural Haryana points out that in Haryana, participation of women in own family farms outside the house as opposed to wage labour on others' farms is not considered as lowering of family prestige, except for certain traditional high castes, with the exception of Brahmins, who have never allowed their women to work in the fields.

Boserup's (1970) work is an outstanding study in the context of women's role in economic development especially agriculture. In her seminal work entitled *Women's Role in Economic Development* she has carried out an in depth analysis of the different types of farming systems that have prevailed historically and has discussed a shift in the gender roles in agriculture over the years. According to Boserup, changes in the gender division of labour have usually been related to changes in population density and farming techniques (Boserup, 1970, p. 18). Boserup has talked about two types of farming systems- the male and female farming systems, with the African shifting cultivation practiced by the African tribes being predominantly female and the Asian plough cultivation being predominantly male, women's contribution in the latter being confined to harvesting and taking care of domestic animals.

“The advent of the plough”, according to Boserup, “usually entails a radical shift in sex roles in agriculture” (*ibid*, p. 33) with women doing little farm work than men as opposed to shifting cultivation where the opposite is true. However as population density increases along with the increase in the intensity of agriculture, both men and women work hard and often take up tasks which were formerly performed by the other sex. Boserup has linked female seclusion to the demand for family labour and the type of farming system with women being generally subject to seclusion where their labour is not very important such as in plough cultivation whereas in wet rice cultivation where demand for female labour is very high they will not be subject to seclusion. Deere (1982) suggests that Boserup’s (1970) study is significant in highlighting the fact that sexual division of labour in agriculture was not based on cultural perceptions regarding the type of tasks that is proper for each sex to engage in, but varies over time in accordance with changes in socioeconomic variables and may be affected by factors such as changes in land tenure, type of cultivation, technology, employment and outside intervention in local productive processes.

Women’s involvement in agriculture and the extent of their participation varies according to the type of crop and the “specific activities related to that crop” (Ishaq & Farooq, 2006). Different crops also require different combinations of male and female labour and “different labour cycles” (Sundar, 1981). The Food and Agriculture Organisation (FAO) (2011) reports studies which reveal that time spent by women in agriculture varies widely and depends on the crop and the phase of the production cycle, the age and ethnicity of the women, the type of agricultural activity and a number of other factors (FAO, 2011, p. 12). In this connection one may cite the differences in labour inputs of the two sexes in dry field plough agriculture and intensive rice cultivation as put forward by Moore (1973) and mentioned by Miller (1982) in her study. Moore (1973) mentions that in contrast to dry field agriculture for alternative staple crops such as millet, maize, wheat etc., intensive rice cultivation involves major contributions from women for transplanting, weeding and harvesting, the latter being shared with males. In rice cultivation, ploughing, which is undertaken by men in all cultures, forms a small proportion of agricultural operations as compared to dry cereal plough agriculture (cited in Miller, 1982). Mollel and Mtenga (2000) mention that in certain areas in Tanzania men control cash crops while females control the production of food crops whereas the FAO (2011, p. 12) reports that studies in Indonesia indicate that women are involved more in the management of young plantation crops such as cinnamon and rubber rather than the same crops at maturity. However, there are inter-country and regional variations in the involvement of women in the production of different crops.

Female labour force participation in agriculture also depends on the size of the holdings. While some studies point to a negative relation between the two some others posit a positive relation. According to Nayyar (1987) there are several micro studies that have established a negative correlation between landlessness and female participation rates. She argues that since landlessness and poverty are often regarded to be synonymous in rural India, women belonging to the category of landless agricultural labourers and marginal and small farms are forced to seek employment in response to their family needs (Nayyar, 1987). Chowdhry's (1993) study reveals that in technologically most advanced and considered the "richest regions" of Haryana, there is an increasing involvement of family females in agriculture with increase in size of the operated holding. Bhati and Singh's (1987) study of women's contributions in agriculture in hill regions of north-west India and Thakur's (1991) study of female farm workers in Himachal Pradesh corroborate the positive relation between the size of the holdings and the work load of the farm women.

The gender roles may also vary across different farming systems. Here a broad distinction can be made between farming systems practiced in the hill and mountain areas termed as hill agriculture, and the plain and lowland areas. The gender division of labour in hill agriculture has been observed to be less strict in contrast to that in the plains, with women playing an important role in almost all agricultural activities. Women's roles in hill agriculture have also been linked to different factors. In a study of the work patterns of women in the central Himalayas, Chopra and Ghosh (2000-01) have linked the nature and extent of a woman's daily workload in the mountain districts to four factors-marital status/age; season; location of the village on the mountain sides and class. In another study of women in Garhwal Himalayas in India, Sidh and Basu (2011) have related the number of hours worked and the nature of women's work on their social status i.e. as daughters, daughters-in-law, or mothers-in-law. The studies also indicate women's role as key agents for collection of energy sources i.e. water and fuel wood. However according to Mollel and Mtenga, (2000), in the farming system of a matrilineal society in the Tchenzema ward in the Western Uluguru mountain in Morogoro in Tanzania, females of all ages did all the domestic work except fuel wood collection which was done by males of all ages. There was no definite gender division of labour either in cash or food crop production although there were differences in the proportion of labour contributed by men and women in few tasks. Decision on production and resource allocation were done jointly between spouses while decision on hiring of labour was mostly done by men. The same is true in the tribal Naga society in north eastern India, as mentioned by Shimray (2004). Though there is a sexual

division of labour, it is more pronounced in housework and not so much in agricultural activities where both men and women are equally important.

Since gender roles in agriculture vary widely across different cultures, socio economic status and different regions, it is inappropriate to make generalizations, and needs to be analysed within specific geographical and cultural contexts for effective policy formulation.

1.4.2. Mountain Farming Systems

According to the global farming system study conducted by Food and Agriculture Organisation (FAO) (2001) seven broad types of farming systems are prevalent to a greater or lesser degree in the developing countries (Dixon et. al., 2001, p. 7). Among them the one of particular relevance to the present study is the rain fed farming systems in steep and highland areas, often mixed crop livestock system better known as mountain farming systems or hill agriculture. “Mountain Farming is broadly defined as all land based activities, such as cropping, horticulture, animal husbandry, forestry, and their interlinkages, and is the prime source of sustenance of the mountain populations. Farming is also the prime user of the natural resource base and production environment in the mountain areas” (Partap, 1995).

The importance of the mountain areas can be understood from the fact that mountains occupy 24% of the world’s area and are home to 12% of the human population, with important resources and assets being located thereof. Mountains and mountain resources directly benefit about 10% of the world’s population as a source of livelihood and well being, and indirectly benefit about 40% through provision of water, hydroelectricity, timber, biodiversity and niche products, mineral resources, recreation, and flood control (Schild, 2008 cited in Schild & Sharma, 2011). Besides, among fourteen tropical hotspots of endemic plants in the world seven of them have at least half of their area in tropical mountains; among them being the Eastern Himalayas and India’s Western Ghats (Denniston, 1995 pp. 38-57 cited in Sharma, 1996). Mountain areas are nonetheless, some of the least developed regions in the world with the mountain communities being for the most part dependent on subsistence farming activities (Shahbaz, Ali, Khan and Ahmad, 2010). The “unique vertical dimensions” of the mountain areas which tell them apart from the plains have created certain distinctive features of the mountains, often called mountain specificities such as “inaccessibility, marginality, fragility, niche, and human adaptation mechanisms” (Sharma, 1996). The first three features lead to “physical isolation, distance and high transportation costs” which results in “poor mobility, vulnerability and risk, limited input absorption, and limited production capacities.” The positive features of the mountain areas are due to the niches or comparative advantages,

and human adaptation mechanisms which provide scope for the development of these areas (*ibid*).

Majority of the people living in the mountain areas depend upon agriculture for their livelihood which is predominantly subsistence in nature, although there is an increasing trend towards commercialization in recent times through high value cash crop farming which is expected to contribute positively to the economic prosperity of the mountain people. The constraints of hill agriculture however, which include remoteness, inaccessibility, marginality and fragility in terms of moisture stress, poor soil conditions, short growing season, along with socio-economic constraints such as small holdings, low productivity, poor production and post-production management, shortage of labour, poor marketing and networks and lack of entrepreneurship have led to under-utilisation of resource bases and limited generation of surpluses (Partap, 2011). These constraints are threatening the very existence of mountain agriculture in recent times making agricultural practices less productive and less remunerative with serious impacts on mountain livelihoods and the future of mountain communities.

An important characteristic of mountain farming systems is their diversified nature unlike the highly specialized modern agriculture usually practiced in lowland areas (Holmelin, 2010). Mixed farming systems are generally adopted and animal husbandry forms an integral part of mountain farming besides crop production. In certain regions the principal agricultural land use is for animal husbandry, such as in parts of Slovenia where cattle breeding is important (Cunder and Markes, 1998) and in Switzerland and Germany where the primary agricultural activity is dairy farming (Giorgi, Eschler and Stucki, 1998 and Kobler, 1998). Pasture animal husbandry dominates farming in Mongolia and the high altitude areas of the Tibetan plateau in China. In certain regions, shifting cultivation is still practiced e.g. in certain dry zones of Sri Lanka, the north-eastern Indian Himalayas where it is known as *jhum*, on the steep slopes in the mountain areas of Thailand and in the eastern regions of Bhutan where it is known as *tsheri*.

Mountain agriculture is primarily rain fed as scope for irrigation is very limited. Animal husbandry is an integral part of mountain farming systems as livestock provide manure and draught power for ploughing, besides supplementing farm income through sale of milk and other dairy products. Farming techniques are simple and primitive and labour intensive (Bhati & Singh, 1987). Altitude plays an important role as range of crops cultivated varies with the altitude. Land available for farming is scarce due to large areas of forest, rocky terrain, low soil fertility and fragmentation and sub division of holdings due to which

the average size of holdings is very small making mechanization difficult. Partap (2011) reports that a majority of the households in the Himalayan states have landholdings of less than 0.5 hectares. Besides being small in size, the land holdings are divided into flat and sloping land with cultivation taking place on terraced fields and slopes with the farmers in the Himalayan regions cultivating sloping lands beyond 25 and 30 degrees in some cases due to scarcity of cropland (Partap, 1999 cited in Partap, 2011).

In recent times mountain areas are being subject to change and commercialization and there is a shift in focus from food crop farming to high value cash crop farming and horticulture as is evident from studies in certain regions of countries like Italy, Korea, Himachal Pradesh in India etc. The cultivation of apples in Himachal Pradesh, saffron in Soppore valley of Kashmir, pashmina goats and yak in highlands of Ladakh or mithun in Himachal Pradesh etc. offer good examples of harnessing of the niche or the specific advantages of the Himalayan areas leading to improvement of livelihoods of mountain communities in sustainable ways.

1. 5. STATEMENT OF THE PROBLEM

Relatively high work participation of women is found in hill areas (Reddy, 1979), and more particularly in hill agriculture. This has been attributed to several factors, such as male out migration for job or education; or due to “armed conflicts in recent times” (e.g. in Afghanistan and Nepal) (Sherpa, 2007) which causes women to participate in almost all agricultural activities from preparing the soil, “sometimes even ploughing and terracing the land, to harvesting, when men occasionally join them” (Chen, 1989); and less stringent gender division of labour in mountain farming systems compared to mainstream agriculture practiced in the plains. The increase in the already high work load of mountain women in recent times due to male out migration has been referred to as “feminization of mountain agriculture and livelihoods” (Kollmair, 2010). This has led to a change in the traditional gender roles in agriculture with women taking up tasks previously performed only by men, which include land preparation, cultivation of crops, spraying pesticides, harvesting, and post-harvest processing and marketing of the produce. If these tasks are performed by women at a wage rate they receive lower wages (Kelkar, 2010). Male out migration and the consequent feminization of agriculture may be said to have a varied impact on the role of women in mountain society. Labour out migration may be said to have some positive impacts as women experience some level of empowerment in terms of managing small budgets and household decision making and less frequent pregnancies, besides improvement in their

economic conditions due to remittances (Xu and Rana cited in Sherpa, 2007; Sherpa, 2007; Kelkar, 2010); but it has also led to “a vacuum” in these regions through extra responsibilities on those few who are left behind resulting in “gendered impacts” (Sherpa, 2007). It has been noted that in certain areas of Nepal, female headed agricultural households have a particularly difficult time due to non availability of male labor for tasks such as ploughing since it is considered to be a taboo activity for women (cited in Lokshin and Glinskaya, 2009).

The predominant role that women play in hill agriculture through their active participation in all aspects of mountain farming from crop production to animal husbandry and collection of fuel wood, fodder and water has been highlighted by several scholars- Bhati and Singh (1987); Chen (1989); Thakur (1991); Rana (1996); Pande (1996); Chhetry (1999); Bose (2000); Chopra and Ghosh (2000-2001); Kursany (2003); Singh (2005); Ishaq and Farooq (2006); Shahbaz et. al. (2010); Sidh and Basu (2011); Moktan and Mukhopadhey (2012); Dwivedy (2014) to name a few. Almost all the studies have highlighted the predominant role played by women in productive activities in mountain farming systems measured both in terms of the number of women working and the number of hours worked, even in conservative Islamic societies of Pakistan and Sudan as mentioned by Ishaq and Farooq (2006); Shahbaz et. al. (2010) and Kursany (2003). Kelkar (2010) observes that the proportion of agricultural work carried out by women is higher in the poor areas. Chetty (1999) in his study of women workers in the informal sector in the Darjeeling Hills has included agricultural activities as an informal activity, because according to him hill agriculture is traditional, highly labour intensive with unregulated goods market and should thus be included in the informal sector. The International Centre for Integrated Mountain Development (ICIMOD), a non-profit organization established in 1983 based in Kathmandu, Nepal has conducted several studies related to various aspects of mountain areas for the Hindu-Kush Himalayan region encompassing eight countries.

It is also well documented that women spend a considerable proportion of their time in the collection of fuel wood and water, the two most essential resources for survival. However, these resources are depleting rapidly due to the effects of poverty, population pressure, climate change, and inappropriate development interventions which have increased women’s work burden in terms of time spent in their collection leaving women with little time to participate in other productive activities, besides posing health hazards (Sharma, 2010). Policies for development of hill and mountain areas should also address these issues.

However, there is a lack of wage labour in these areas as most of the female workers are family farm labour, and face severe constraints due to marginal rain fed agriculture; inadequate sources of fertiliser, seed, credit and agricultural extension; poor irrigation and water management; low yields; labour shortage; and lack of markets for input purchase and marketing of products (Chen, 1989). For the women to be recognized as farmers, the issue of land rights is a crucial one. However, due to socio cultural rigidities and discriminatory policies against women, they are denied access to productive assets such as land, credit and extension services. Women's access to financial resources e.g. land, property or other assets is vital not only for increasing production, but for improved levels of welfare for themselves and their families and a betterment of their economic position along with changes in social and cultural gender norms (Kelkar, 2010). Agarwal (1994) notes that although women have struggled for land inheritance and ownership and have also been victorious in legal terms in many South Asian countries, the reality is different-very few women own land and even fewer have effective control over it (Agarwal, 1994, p.2).

It is therefore apparent that rural women in the hill regions play a very vital part in ensuring household food and economic security through their labour inputs as unpaid family helpers on family farms or as petty traders, together with their unpaid contributions to domestic activity. A major proportion of their labour and time contribution nevertheless, being subsumed as home based work remains unquantified and hence undervalued. Given the mountain specificities of marginality, fragility and inaccessibility, farming practices in the mountains are demanding, especially for women folk. Taking the hill region of the state of West Bengal the present study endeavors to highlight the role of rural women in mountain economy through an empirical analysis of the gender roles in the various activities related to agriculture i.e. crop production and livestock rearing, along with domestic activities which are crucial for the sustenance of the household. Not being offered for a price or wage women's unpaid labour escapes statistical enumeration. In this context time use surveys, which provide detailed information on how individuals spend their daily time, have been used to examine the differentials in time allocation to different activities by men and women which would help capture and value women's unpaid work and also provide an in depth understanding of women's daily life, their work and contributions to the rural hill economy. Besides this, the study attempts to explore and identify the factors determining the work participation of women in paid as well as unpaid activities as family labour on household farms. This is important to understand the factors that foster or inhibit women's involvement in the labour market, and suggest ways to enhance their participation in economic activities

for individual and familial wellbeing. Realising the importance of women's role in agriculture, the study also aims at exploring the determinants of the time spent by women in agriculture and the constraints they encounter.

1.6. A BRIEF INTRODUCTION OF THE STUDY AREA

The study area chosen for the purpose is the hill region of the state of West Bengal, India which comprises the Darjeeling district, the only hill district in the state. On 14th February 2017, Darjeeling district was bifurcated to form two districts- Darjeeling comprising Darjeeling Sadar sub-division and Kurseong sub-division; and Kalimpong comprising Kalimpong sub-division. On 30th March 2017, Kurseong sub-division was also bifurcated to form two sub-divisions- Kurseong and Mirik sub-divisions. However at the time of undertaking the present study Kalimpong was a sub-division of Darjeeling district and Mirik was included in Kurseong sub-division.

The study area forms a part of the north-eastern Himalayas of the Indian Himalayan range. The Himalayas, the youngest and highest mountain systems in the world traverse an arc of about 2,500 kms between the Indus and the Brahmaputra rivers, with an average width ranging from 100-400 kms. The Himalayas pass through eight countries- Afghanistan, Pakistan, India, China, Nepal, Bhutan, Bangladesh and Myanmar. In India it stretches from the states of Jammu & Kashmir in the west to Arunachal Pradesh in the east and includes the states of Jammu & Kashmir, Himachal Pradesh, Uttaranchal (now Uttarakhand), Sikkim, Assam, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Tripura and West Bengal covering 18 percent of the geographical area and accommodating 6 percent of the country's population (Shaheen, Wani and Baba, 2010). The northeast Himalayas include the states of Sikkim, Manipur, Meghalaya, Nagaland, Tripura, Arunachal Pradesh, Mizoram, hilly areas of Assam and Darjeeling and Kalimpong districts of West Bengal. Though the hills and mountain areas are characterized by heterogeneity, there are some common features which are characteristic of hill areas such as inaccessibility, fragility, marginality, difficult terrain, extreme vulnerability to natural calamity such as landslides, poor infrastructure and distinct gender dimensions.

Renowned the world over for its aromatic "Darjeeling Tea" and the mighty Kanchanjungha, the Darjeeling hills of West Bengal fondly known as "The Queen of the Hills", occupies an important place in the tourist map of India. The economy of the region is primarily dependent on three Ts i.e. tea, tourism and timber, along with agriculture. The tea industry is the backbone of the hill economy with the Darjeeling Hills having the highest

concentration of tea industries in the eastern Himalayas and absorbing the largest number of workers in the region (Chhetry, 1999, p. 36). Tourism occupies an important place in the economy of the region and attracts a huge number of domestic and foreign tourists every year. Besides, agricultural activities also contribute to the economy of the region despite its declining share in the district's net domestic product.

Agricultural activities in the hill regions are constrained by the climate and topography, and are characterized by traditional and labour intensive subsistence modes of production. The region has only over 13% of the total geographical area under cultivation (Dasgupta, 1990, p. 62). The type of crops cultivated depends upon the altitude and climate and no crops are cultivated above 9,500 ft above sea level due to the cold climate (Dash 1947, p. 99). Due to the slope of the land, cultivation takes place on terraced fields which are generally rain fed or irrigated in some cases. Cash as well as food crops are grown and in the valleys fruits may also be cultivated. Animals are important as they supply the main draught power and manure for the fields and are supplementary sources of income.

The district shows relatively higher work participation rates for females vis-à-vis other districts. According to the 2011 Census, the rural female work participation rate for the hill district of Darjeeling (including Kalimpong sub-division) was 26 per cent, which is the third highest among all districts and higher than the State average, which stood at 19.4 per cent. Lack of caste-specific occupational specialisation, higher cost of living, and low productivity of land are identified as some of the reasons for the high rate of work participation in Darjeeling district vis-a-vis other districts (Subba 1985, p. 20). Gender division of labour, which is weaker in highland areas, may be contributing towards high female work participation in the district.

Realising women's pivotal role in sustaining rural livelihoods through their active involvement in agriculture and allied activities together with other domestic activities, the present study has been undertaken to understand the nature and extent of women's work and to enquire into the factors determining their participation in the hill region of West Bengal.

1. 7. OBJECTIVES OF THE STUDY

From a survey of related literature, the proposed study would endeavor to fulfill the following research objectives:

1. To analyse the structure and pattern of women's work participation in the district through an analysis of Census data.

2. To examine the gender roles in domestic and agricultural activities i.e. crop production, animal husbandry and allied activities.
3. To examine the daily work patterns of men and women in the rural hill economy.
4. To determine the factors affecting female work participation in the study area.
5. To identify the factors determining women's participation in agriculture.
6. To highlight the role of women in providing household food security.
7. To highlight the constraints faced by the hill women farmers.
8. To suggest policy prescriptions for improving the condition of hill women farmers for their economic betterment and the economic betterment of the region as a whole.

1. 8. RESEARCH QUESTIONS

The study endeavours to answer the following research questions.

1. What is the structure of employment of men and women in the study region?
2. What are the gender roles in domestic and agricultural activities in mountain farming system?
3. What are the factors determining the labour input of women in mountain farming systems?
4. What are the factors that determine the time spent by women in agriculture?
5. What is the relationship between male outmigration and women's work participation?
6. What constraints do women face in access to productive resources?

1. 9. RESEARCH HYPOTHESES

The study would like to test the following research hypotheses.

1. Women's work burden in hill areas is higher than that of men.
2. Labour input of women is higher than that of men in agricultural activities.

3. Labour input of women is higher than that of men in domestic work.
4. Male outmigration has increased the work participation of hill women.
5. Education enhances women's participation in the labour market.
6. Labour force/work participation of women is relatively higher in case of low income families.
7. Women with larger land holdings spend more time in agriculture.
8. Women have unequal access to productive resources- land, credit, information and extension services.

1.10. SIGNIFICANCE AND LIMITATIONS OF THE STUDY

The study is significant due to the following reasons:

1. The study presents an analysis of the structure and growth of the work force and the trends in the female work participation rates vis-à-vis the male work participation rates, in the (former) district of Darjeeling using secondary data from the Census of India. This will help to provide an insight into the position of women vis-à-vis men.
2. The study is significant because it highlights the role of mountain women in the subsistence agricultural hill economy of the Darjeeling Himalayas through an analysis of the differences in gender roles in agriculture, livestock rearing and domestic activities. Through time use analysis the study also presents the time patterns in the daily life of mountain women.
3. The results of the present study will help to understand the role of women farmers in hill agriculture, their constraints and their potential. The findings of the study can also be utilized in formulating policies and development plans for the region so as to generate employment opportunities for improving the economic condition of the women and their families.

The study is not free from limitations. Being based on primary survey data the study is fraught with several problems which have reduced the scope of the work to some extent.

1. Some of the women respondents were illiterate as a result of which they were unable to provide precise information regarding certain aspects like income, expenditure, land holding of the household and the price at which the agricultural products were

sold. In such instances, the male members of the household were also questioned to provide the required information.

2. Most of the responses i.e. the time spent on different activities, the expenditure on food and non-food items etc. were based on the recall method. As such, the recall errors present in such studies is an inherent limitation of the present study.
3. Since the study considers only three villages in the hill region, the results of the study may not be representative of the women folk of the entire hill region.

1.11. DATA AND SAMPLING DESIGN

Since the objective of the present study is to analyse and highlight the role of rural women in mountain farming system, the hill region of the state of West Bengal which comprises the district of Darjeeling (including Kalimpong sub-division) has been selected, as it is the only hill district in the state.

The study is descriptive in nature and utilizes both primary and secondary data. However, the key source of information is primary data collected through socio-economic survey of the various rural households. Detailed information as required by the study has been collected through in-depth interview of the rural women using a structured questionnaire. Information on socio-economic and demographic characteristics of the household was also collected. The male members of the household were also interviewed to obtain additional information regarding the nature of activities performed, the cropping pattern, household income, size of land etc. Besides, information was also obtained from some knowledgeable person of the village like the village headman or other educated persons. Besides the primary data collected through field survey, secondary data from various sources has also been used as required. The various secondary data sources have been obtained from the Census of India, National Sample Survey Organization, District Statistical Handbooks, Block Development Office and other public documents.

Multi-stage purposive and random sampling techniques have been used for selection of villages. Since the study intends to highlight the role of women in mountain farming systems, the first stage involves selection of the hill district of Darjeeling (including Kalimpong sub-division) in the state of West Bengal. The second stage involves selection of the sub-divisions. At the time of undertaking the present study Kalimpong was a sub-division of the district of Darjeeling and was accorded district status on 14th February 2017. The former district of Darjeeling comprised four sub-divisions; Darjeeling Sadar, Kurseong, Kalimpong, and Siliguri, with the first three sub-divisions being in the hill areas and the

fourth in the plains. Siliguri sub-division has therefore been excluded from the present study as it lies in the plains and the study has focussed on the three hill sub-divisions of Darjeeling Sadar, Kurseong and Kalimpong.

The next stage involves selection of the blocks. Among the three former hill sub-divisions of Darjeeling district, i.e. Darjeeling Sadar, Kurseong, and Kalimpong; Darjeeling Sadar and Kalimpong (now district) have three Community Development blocks each and Kurseong sub-division two Community Development blocks. One community development block each, with a higher than average proportion of agricultural workers, was chosen from Darjeeling Sadar and Kalimpong, and Kurseong block was chosen from Kurseong sub-division because of its proximity to the town. Darjeeling-Pulbazar block was chosen in the Darjeeling Sadar sub-division with 44.2 percent of agricultural workers, and Kalimpong II was chosen in Kalimpong sub-division with 61.9 percent of agricultural workers. In Kurseong sub-division Kurseong block was chosen over Mirik due to proximity from the town.

The final stage involves selection of the villages. In this stage a village with a relatively high proportion of agricultural workers was selected randomly from each block. The villages selected for the purpose of the study were Samalbong in Darjeeling-Sadar, Git Dubling Khasmahal in Kalimpong, and Sitong Khasmahal in Kurseong. At present Darjeeling district has four sub-divisions; Darjeeling Sadar, Kurseong, and Mirik, which was carved out of Kurseong sub-division on March 30th 2017; and Siliguri. Kalimpong is a separate district. Fifty households were selected from each village. The households chosen in the study are those wherein the family members participated in agricultural activities either for commercial purposes or for subsistence. This gave a total of 150 households surveyed.

1.12. ANALYTICAL TOOLS USED

For testing of various hypotheses in the proposed study, statistical and econometric tools have been used for the analysis of primary data. Statistical tools such as percentages, means, averages, measure of dispersion etc. have been used along with econometric tools such as Analysis of Variance (ANOVA), logistic regression and multiple regression to test the different hypotheses. One way ANOVA test along with pos hoc tests have been carried out to check for differences in the time spent by men and women in different activities. Differentials in time allocated by women to various activities on the basis of size of the holding has also been analysed using the ANOVA and post hoc tests. To draw inferences regarding the causal relationship between women's work participation and selected socio-economic and

demographic variables, a logistic regression exercise has been carried out. Since most of the women in the region have been found to be involved in agriculture, a multiple regression exercise has also been undertaken to identify the factors that may influence the time spent by women in agriculture. Secondary data have also been used only to throw light upon the demographic characteristics, industrial classification, work participation rates, cropping pattern, cropping intensity etc.

1.13. PLAN OF PRESENTATION AND CHAPTERISATION

The introductory chapter provides a general outline of the study. The theoretical perspective on female labour force participation has been discussed along with important issues related to women's work especially in the hill areas. The research problem has also been introduced with a brief review of related literature along with the objectives of the study, the research questions to be answered and the research hypotheses to be tested during the course of the study. The chapter also outlines the sources of data, the sampling design, analytical tools to be employed, introduction to the study area etc.

The second chapter provides a detailed review of related literature by analyzing different aspects related to female labour force participation. A global perspective on female participation rates and a review of women's work in India has also been discussed. A review of literature has been done on determinants of female labour force participation, time use studies and women's role in agriculture and their work in the hill areas with the primary focus being on highlighting women's contributions and their disadvantaged position.

The third chapter describes the study area which is the hill region of the state of West Bengal i.e. the district of Darjeeling. All information in the secondary data sources pertain to the former district of Darjeeling. In this chapter a brief account of the history, geography, economy and demography of the former district of Darjeeling is provided along with a concise description of the state of agriculture as available from secondary sources.

The fourth chapter presents an analysis of the trends and structure of female labour force participation in India, West Bengal and the district of Darjeeling. The analysis is based entirely on secondary data obtained from Census of India, National Sample Survey Organisation (NSSO), and District Statistical Handbooks for different years. The trend in female labour force and work participation rates for India and West Bengal on the basis of NSSO data has been presented followed by an analysis of work participation rates on the basis of Census data for the state and the district according to male-female, rural-urban, main-

marginal etc. differences. Work participation rates by age, level of education and marital status for the district has also been discussed in the chapter.

The fifth chapter is based on primary survey data. The main focus of this chapter is to provide an insight into the nature and extent of women's work in the study area and highlight their importance to the rural hill economy. The chapter provides a comparative analysis of the labour market characteristics of the study villages by representing the structure of employment. Women's workload vis-à-vis that of men has also been assessed through portrayal of gender division of labour in various activities. ANOVA and post hoc tests have also been carried out to test for differences in time allocation pattern of men and women in different activities, and differences in time allocation by women belonging to different size class of land holdings.

In the sixth chapter an econometric analysis of primary survey data has been carried out wherein the study attempts to identify the covariates of female work participation in mountain farming system through a logistic regression exercise. In doing so, the study has estimated two models- Model I which takes into consideration both paid and unpaid employment of women as participation in the workforce; and Model II which considers a more restrictive definition of participation to include only paid market work, and covers both wage and self-employment. Selected socio-economic and demographic variables have been considered as explanatory variables in the analysis.

The seventh i.e. the penultimate chapter provides an account of women's role in agriculture in the study villages. A multiple regression analysis has been carried out to find the determinants of the time spent by women in agriculture. Women's role in ensuring household food security and the constraints they face in terms of access to productive resources is also highlighted in the present chapter. The chapter concludes with a few case studies of women in the study villages.

The final and the concluding chapter includes a summary of all the previous chapters and also provides some policy prescriptions for increasing women's participation in income generating activities which would help in improving their economic status besides contributing to the development of the rural hill economy of Darjeeling in a suitable and sustainable manner.

1.14. CONCLUSION

Female work participation which shows the proportion of economically active females among the total female population has been an important area of research for several

scholars. Women's issues gained importance during the decade of the 1970s due to disappointment over the "trickle-down effect" which did not consider women's issues as different from those of men. Ester Boserup's (1970) seminal work *Women's Role in Economic Development* along with the United Nations Decade for Women launched in 1975 paved the way for integration of women's issues in the development agenda and gender equality became a global concern. The preoccupation of scholars with the issue of female labour force/work participation stems from several reasons. Firstly, women's labour market experiences are more varied and complex vis-à-vis that of men, being determined by a combination of economic and non-economic factors. Secondly, much of work that women perform, especially in poor subsistence economies is unrecognised and undervalued since a major portion of work that women do being unpaid, is subsumed under the category of household work. This leaves much of their work outside the realm of national income statistics, which negatively impacts on their status within and outside the household as being inferior to that of men. Thirdly, women's participation in economic activities has important implications for the growth and development of economies due to the positive correlations it has with improved individual and familial welfare as observed from several micro level studies.

The review of literature on theoretical perspective of female labour supply considers the most dominant schools of the neo classical, Marxian and feminist frameworks and the bargaining models along with a brief mention of the theories of discrimination. In the neoclassical framework the new household economics of Becker, Mincer etc. is important in explaining women's labour supply for it includes time as an additional element in the utility maximisation process of the household and regards households as places of production and not only consumption. In the Marxist paradigm women's questions were not considered separately but subsumed under the analysis of class relations. Early Marxists consider capitalism to be the factor for women's increased participation in the labour force. Nevertheless the priority accorded to production in the Marxist analysis and the distinction between exchange value and use value led to women's unpaid domestic labour producing use values as being unproductive. At the heart of the feminist theory is the need to bring about gender equality through proper evaluation of women's reproductive labour which includes all the unpaid work that women perform and which is essential for sustenance of households. In contrast to the unitary model of the household, the bargaining theories are significant as they capture individual preferences, conflicts and inequalities that may arise among the household members and help explain intra household dynamics. The theories of discrimination help

explain the gender differentials in wages in terms of the human capital theory, Becker's taste model, model of statistical discrimination, and the crowding hypothesis.

The vital role that women play in agriculture especially in developing nations where it is the primary occupation of the people, is well document in development literature. A lot of studies also focus on the gender roles in agricultural activities with women being concentrated in activities which are regarded as "indoor" in contrast to men who have a higher involvement in "outdoor" activities. Although women in hill and mountain regions are known to have higher participation rates which have been accorded primarily to high male outmigration in these regions leading to feminization of agriculture and livelihoods, most of them are family labour. Women in these regions face double oppression, firstly, by virtue of their gender and secondly, by virtue of their location i.e. the hill and mountain regions considered to be some of the least developed regions in the world. Studies which focus on the role of mountain women express concern over their invisibility in mainstream development policies despite their high workload owing to their lack of access to productive resources, and constraints due to the unique physical features of these regions. These regions nevertheless possess some unique advantages due to climate, temperature etc. which may be harnessed for commercialization of traditional agriculture to non-traditional items for making agriculture in the region more remunerative. In this regard, women may be regarded as important agents of change given their high involvement in agriculture and allied activities.

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Chapter II

Women's Labour Force Participation- Related Issues

2. 1. INTRODUCTION

In recent decades some progress for women has been witnessed in the world of work, education and reduced gender inequalities in several parts of the world. Changing social and cultural norms which can be attributed to the strong feminist movement has contributed significantly to the improvement in women's status. Nevertheless, major variations across regions and nations in terms of gender gaps in participation rates, occupational distribution, working conditions and wages are still evident, and much still needs to be done.

The labour market of the developed countries such as United States, Canada, Great Britain and Germany have shown a marked increase in the participation rates for married women as compared to non-married, widowed or divorced women during the twentieth century, although participation rates of married women is lower than that of other women (Killingsworth and Heckman, 1986, pp. 106-109). Increase in women's earnings as the Western economies developed with rapid expansion of the service sector appears to have contributed to the increased participation of married women in the western world (Becker, 1981, pp. 54-55). The increase has also been attributed to technological factors such as introduction of time-saving consumer durables that reduced the time required to carry out traditional tasks in the household such as washing machine, vacuum cleaner etc. (Greenwood, Seshadri and Yorukoglu, 2004), the advent of the pill (Goldin and Katz, 2002) that enabled women to control fertility etc. (cited in Fernandez, Fogli and Olivetti, 2004).

Paid employment of women has however increased at a slower pace and women continue to bear a larger share of unpaid work with almost two-thirds of all employed women in developing countries working as family workers or own account workers in highly vulnerable jobs with no security and benefits (Agenor and Canuto, 2013). On an average, it has been observed that 35 to 50 per cent of the total work time is spent on unpaid work all over the world (Antonopoulos, 2009) with the maximum amount of it being performed by women (cited in ActionAid, 2017, p. 13). The OECD Gender Institutions and Development database (2014) reports that internationally, the amount of time spent by women on unpaid work is approximately three times the time spent by men; the situation in India being much worse with the extent of women's unpaid care work being 9.8 times that of men (cited in Mckinsey Global Institute, 2015). A valuation of such unpaid work would contribute \$0.3

trillion to India's economic output (*ibid*). Not only do women perform majority of the unpaid work, even where paid work is considered they are found to be concentrated in certain occupations which are considered "feminine" with their earnings being lower compared to that of men. The ILO (2016), reports that most of the women are engaged in non-standard, informal, temporary, part-time and low-paid jobs (ILO, 2016, p.1).

Since women comprise almost half the global population, keeping them out of the labor force causes enormous loss to the economy as higher rates of female labour force participation have been found to enhance economic growth and alleviate poverty (ActionAid 2017, p. 13). The McKinsey Global Institute (MGI) (2015) estimates suggest that women in India represent only 24 percent of the labour force that is engaged in any form of economic activity, compared to the global average of 40 percent and their contribution to GDP is only 17 percent which is much lower than the global average of 37 percent, and the lowest among all regions in the world. This may be attributed to the social attitudes about women's role in society. The report also states that \$2.9 trillion of additional annual GDP in 2025 could be added in India by fully bridging the gap in the workplace, which is 60 percent higher than business-as-usual GDP in 2025 (*ibid*).

The labour market behaviour of women has attracted the attention of several scholars, and over time a great number of researches have been conducted to identify the causes of women's participation or non-participation in the labour market and other issues related to women's labour supply. Women's labour supply decisions are not uniform and exhibit considerable cross-country variations. Chapter I has introduced the topic of female labour force participation and has also presented the theoretical perspective on the subject. Having realised the relevance of studies on female labour force/work participation, the present chapter presents a review of related literature on some important issues related to participation of women in economic activities. Owing to the vastness of available literature on female labour force/work participation, the present chapter has taken up literature review only on certain key issues such as determinants of female labour force participation, time use studies, gender differentials in wages, women in agriculture and women's issues in hill regions.

2.2. WOMEN'S WORK PARTICIPATION

2.2.1. A Global Perspective

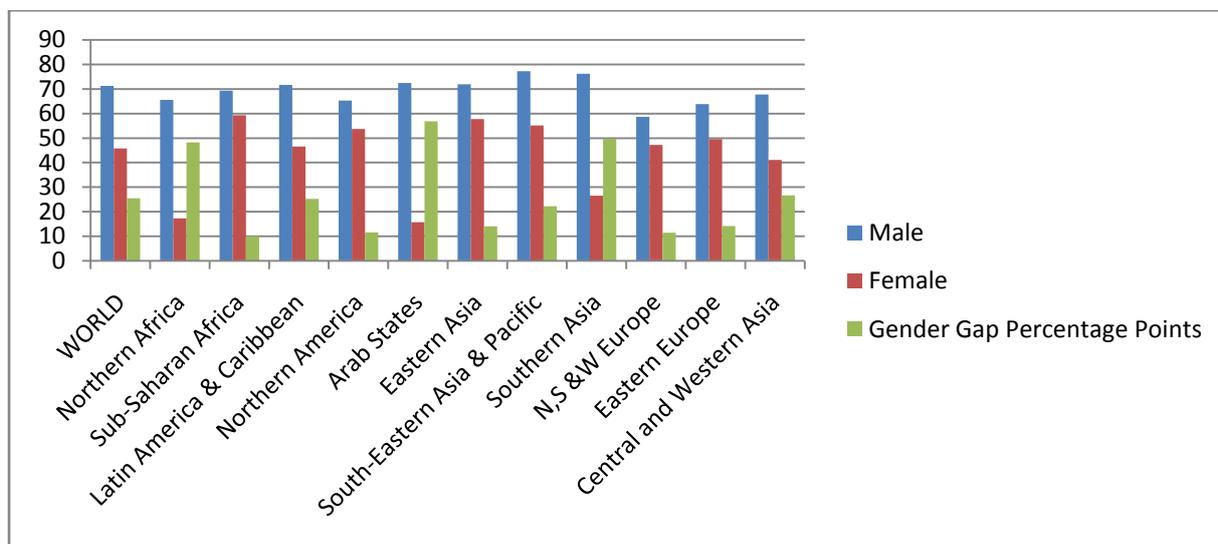
Woman as an important human resource has been not been utilized fully with female labour force participation rates being lower than that of male participation rates, the world over. In

2012, out of the total labour force of 3.3 billion, the female labour force was estimated to be 1.3 billion which was about 39.9 per cent of the total labour force. The global female participation rate was estimated to be 51.1 per cent and the rates varied between a low of 16 per cent in Jordan to close to 90 per cent in Tanzania with India being among the countries with relatively lower rates (ILO, 2012, pp.15, 17). It has been reported by the ILO (2016) that over the last quarter (1995–2015), there has been a decline in global female labour force participation rate from 52.4 per cent to 49.6 per cent, with the corresponding figures for men being 79.9 per cent and 76.1 per cent respectively, showing that the chances for women to participate in the labour market remain almost 27 percentage points lower than those for men (ILO, 2016, p. 6).

The figures for employment-to-population ratios (in percent) for male and female along with the male female gender gap for the different regions of the world for 2017 are shown in Figure 2.1. The figures reveal that at 48.5 per cent, women’s global labour force participation rate is 25.5 percentage points below that of men. The female participation rates are found to be less than 20 percent in the Arab States (15.7 percent) and Northern Africa (17.3 percent), whereas in Southern Asia it is 26.5 percent (ILO, 2018). Along with low participation rates, a large number of women especially in developing economies are found to be concentrated in low productivity informal jobs with no social security. Termed as vulnerable employment such jobs basically comprise contributing family workers and own account workers as opposed to wage and salaried workers and employers. The Global Employment Trends Report of the ILO (2012) points out the large differences between male and female vulnerable employment rates in different regions of the world ranging from 23.6 percentage points in North Africa to 0.7 percentage points in Latin America and the Caribbean (ILO, 2012).

The sectoral and occupational distribution of men and women is also found to be unequal with women being concentrated in certain sectors and occupations. Globally, women are found to be concentrated more in agriculture (36.4 percent as opposed to 32.8 percent for males) and services (47.4 percent as opposed to 41.3 percent for males) and less in industry (16.2 percent as opposed to 25.9 percent for males) in 2012. Occupational segregation has been observed in both developing and developed economies with men predominating in jobs such as “craft and related trades workers”, “plant and machine operators” and “managerial and legislative” occupations. Women, on the other hand are found to have high concentration in mid-skills occupations, such as “clerks and service workers” and “shop and market sales

workers”. This suggests that in comparison to men, women have limited opportunities and access to employment (ILO, 2012).



Source: ILO modelled estimates, May 2018. Available at: www.ilo.org/ilostat

Figure 2.1: Employment-to-population ratio (percentage) and Gender Gaps by Region, 2017

The gender gaps in labour force participation rates have narrowed in most regions of the world whereas in certain other regions they have increased owing to several factors. The regions which have experienced a narrowing of gender gaps are Europe, South-Eastern Asia and the Pacific, Central and Western Asia, Latin America and the Caribbean, Northern America, Sub-Saharan Africa, the Arab States, and to a lesser extent Northern Africa. The convergence has been attributed to several reasons such as- the “added worker effect”, increase in women’s employment in export oriented sectors following trade liberalisation, improved education, decreasing fertility, provision of subsidized child care etc. which have been found to vary across regions. In Southern and Eastern Asia there has been a widening of the gender gap in participation which has been attributed to conservative social attitudes towards women due to cultural and religious beliefs which reduce female participation rates as they devote more time to household production as compared to men (Agenor and Canuto, 2013; ILO 2016, pp. 6-7).

In South Asia, female participation rates range from around 20 percent in Pakistan to almost 80 percent in Nepal, which can be explained by differences in social and economic factors (Verick, 2014). Bhutan’s female labour force participation rate stood at 55.9 percent as opposed to 71.2 percent for males in 2015 which is higher than that of most countries in

the region. While Nepalese and Bhutanese women participate more due to less social restrictions (UNESCAP, 2016), women's participation in Pakistan may be constrained due to socio-cultural and religious norms. The lower participation rates in the Muslim countries have been attributed to socio-cultural norms and the importance of values such as family honour and modesty which carries with it a social stigma to women's paid labor (Moghadam, 1990; Jehan, 2000; Grace, 2004; Jaim and Hossain, 2011). Nepalese women especially in the rural areas have a higher work load primarily due to high male outmigration (Sherpa, 2007) and poverty considerations (UNESCAP, 2016). In some countries of South Asia there has been a rapid increase in women's employment which is due to the growth of labour-intensive, export-oriented sectors, such as the ready-made garment sector in Bangladesh together with a rise in livestock rearing (linked to access to micro-credit); and tourism in Maldives, as social norms identify many occupations in these sectors as women-centric (Rahman and Islam, 2013, cited in Verick, 2014; UNESCAP, 2016). However, gender gap in labor force participation is still evident in the region in spite of the gradual rise in female labor force participation over the decades (Mahmud and Bidisha, 2016).

2.2.2. Studies in India

India is one of the several countries with low labour force participation rates especially for females. The Hindustan Times (2017) reported that in its India Development Report, according to the World Bank India had one of the lowest female participation in the workforce, ranking 120th out of 131 countries for which data was available. The report further stated that job creation has been limited and men have taken hold of most of the new jobs due to the prevailing societal norms ("India ranks 120th", 2017). As per the recent statistics of the ILO, employment-to-population ratio for females in India was only 26.1 percent whereas that for males was 76.2 percent (ILO, 2018). According to the Census 2011, the female work participation rate in India is 25.5 percent and the male work participation rate is 53.3 percent (Census, 2011).

Using the two main official sources of data i.e. the decennial census data and the quinquennial rounds of National Sample Survey Organisation (NSSO) data, a large number of studies in India have focused on the problem of enumeration of the female workers, especially in rural areas which leads to their under estimation. The most important reason cited for this underestimation of women's contribution in productive work is the definition of the worker used in the different Census years which fails to incorporate women's unpaid activities on family farms as unpaid family labour. Further, the studies also point out that women perform both housework and productive work simultaneously and hence division or

distinction between the two becomes a difficult task (Sunder, 1981; Agarwal, 1985; Nayyar, 1987; Duvvury, 1989). Biases in data collection may also arise as a consequence of the gender of the respondent and the enumerator, as pointed out by Agarwal (1985). In most Third World countries including India, the respondent is mostly the male head of household or other male members whose responses regarding women's work status and her availability for work reflect a male point of view leading to an under estimation of women's work participation (*ibid*).

A notable phenomenon which has been discussed by scholars at great length in recent years is the decline in rural FLFP rates in India since 2004-05 as revealed by the different Rounds of National Sample Survey Organisation (NSSO). The rural FLFP for all ages according to usual principal status dropped from 24.9 per cent in 2004-05 to 18.1 percent in 2011-12. In the urban areas and among educated women the participation rates are even lower. When women work they are mostly engaged in marginal jobs, or as home-based workers i.e. family worker/unpaid worker or as domestic workers (ILO, 2017). The decline in female participation rates during a period of rapid economic growth in the economy has caused economists to delve into the reasons for this puzzling decline. Though several explanations have been offered for the observed decline it cannot be attributed to a single factor (Mazumdar and Neetha, 2011, Rangarajan, Kaul and Seema, 2011; Himanshu, 2011; Chowdhury, 2011; Neff, Sen and Kling, 2012; Mahapatro, 2013; Lahoti and Swaminathan, 2013; Sanghi, Srija and Vijay, 2015). While some studies attribute this decline to increase in the number of women pursuing education in the rural areas, others attribute it to the income effect whereby increase in household income due to increasing real wages causes women to move out of the labour force, while still others attribute it to the absence of or decline in employment opportunities in rural areas especially non-farm employment. Mahapatro's (2013) study conducted to investigate the declining trends in FLFP by sorting out the trends into age, period and cohort effect suggests that a considerable decline in labour force participation can be explained by the age and period changes although cohort is not of lesser importance. Lahoti and Swaminathan's (2013) study using state level employment data indicates that in India the observed decline in FLFP cannot be regarded as a normal outcome of the development process in which the FLFP increases with more growth, as has been the experience of several other countries. The study further mentions that, in India growth has not been employment intensive which affects women's labour market options more than men's. The key driver of growth in India, Lahoti and Swaminathan (2013) mention has been the services sector which requires more skills which are lacking in most Indian women. As

opposed to the services sector, agriculture and manufacturing are employment intensive but they have not led the growth process in India.

Inter-state variations in female participation rates have been observed in India and several studies have been conducted to explain these variations (Gulati, 1975). Within India, as one moves from north to south or from east to west the female participation rates have been found to increase (Nayyar, 1987). Miller's (1982) study which uses 1961 Census data finds that the internal hilly regions and the mountain districts bordering Tibet have the highest female participation; the reasons for which is attributed to the fact that these are areas which practice swidden cultivation and exhibit high rate of male emigration. In order to identify the possible factors for the interstate variations in female participation rates, several studies were undertaken. Most of the studies failed to yield satisfactory results as the explanatory variables were not found to be statistically significant (Gulati, 1975; Nayyar, 1987; Dholakia and Dholakia, 1978) since the rural FWPRs across Indian states could not be attributed to a single set of significant factors (Sinha, 2005). Gulati's (1975) study using 1971 census data used variables such as different levels of per capita income, literacy and male participation rates, the cropping pattern, varying proportions of scheduled caste (SC) and scheduled tribe (ST) population, or differing sex ratios; but could not explain the variations in female participation due to the use of aggregative data. Dholakia and Dholakia's (1978) multiple regression exercise, using variables such as per capita income, assets per household, structure of employment, sex ratio, average size of household and literacy did not yield a good fit model. Nayyar's (1987) regression exercise used 1961-81 Census data and various round of NSSO data from 1972-73 to 1983. Taking two independent explanatory variables at a time which included the incidence of rural poverty, the literacy rates, the co-efficient of variation in the distribution of landholdings in rural areas, the proportion of total agricultural labourers in the rural workforce, the price of cereals, per capita income, per capita production of food grains and state domestic product in agriculture at constant prices the study found none of the variables as being significant in explaining interstate differences in female participation rates at the macro level. Reddy's (1979) study however notes that female WPRs in India are influenced by socio-cultural factors and level of income. A more recent study by Srivastava and Srivastava (2010) using secondary data from different sources concludes that the only major variable explaining the inter-state variation in total rural female WPRs is the share of SC/ST in the population. The study also shows that as a whole the variations among the states in WPRs in non-agriculture and participation in wage labour outside agriculture

depends on women's average educational level and other factors reflecting women's economic autonomy and their control over resources.

Although macro studies do not yield any significant results, the micro studies point to the importance of economic and socio-cultural factors in determining female participation rates in rural India (Nayyar, 1987). Poverty and landlessness appear to be the two main economic factors along with male wage rates, but in some cases socio-cultural factors, like religion dominate; while the levels of education and literacy and demographic compulsions have an insignificant impact on female participation rates in India (*ibid*). Sinha's (2005) study of female WPRs in four districts of rural West Bengal, viz. Haora, Puruliya, Murshidabad and Maldah using secondary data mentions that female WPRs are strongly influenced by region specific factors which make it difficult to make generalisation regarding the association between rural female WPRs and any relevant variable at the all-India or the state level. The study further observes that the role of non-economic factors in explaining rural female WPRs may be stronger in districts with lower female WPRs i.e. Haora and Murshidabad compared to those with higher female WPRs i.e. Puruliya and Maldah since the regression results for the latter two districts reveal a better fit than for the former two.

In the Indian context it may be said that the women's participation rates do not exhibit uniformity and vary across different states and regions with the rates being determined by an array of economic and non-economic factors many of which cannot be quantified or measured.

2.3. DETERMINANTS OF FEMALE LABOUR FORCE PARTICIPATION

While men's participation in work is largely determined by economic factors, the factors that determine women's work participation are varied and include factors like social, cultural, religious, reproductive, demographic etc. (Srivastava and Srivastava, 2010). It is also argued that women's economic activity is the result of the interaction between patriarchy, class and production conditions (Kak, 1994). In the Indian context women's entry into the workforce may be hindered by the traditional norms of class/caste which generally prevent upper class/caste women from working outside the family or cause them to take up specific tasks in the labour market (*ibid*). Some prominent explanatory variables identified by the different studies include education, income, family size, fertility, marital status, size of land holding, etc.

Reddy's (1979) study based on 1971 census data for 15 states attempts to explain the factors affecting rural female work participation in India by applying the multiple regression

techniques and five independent variables- the ratio of rural female cultivators to male cultivators, average daily earnings of men in agriculture, agricultural labour productivity, rural industry-mix index of female workers and density of rural population. The regression analysis revealed rural female work participation to be influenced mainly by socio-cultural factors and level of income.

Hafeez and Ahmad's (2002) study based on the field survey conducted in the district Mandi Bahaudin in Pakistan during 1998-99 attempts to identify factors which influence the labour market decision of educated married women. The study finds that while level of women's education has a significant positive impact on FLFP, monthly income of the household, number of other workers in the household besides husband and wife and financial assets have a significant negative impact on FLFP. Demographic factors such as age and the size and structure of the household have a positive impact on FLFP.

Dev's (2004) study uses NFHS-2 (1998-99) data to identify the determinants of female work participation and child labour. His analysis on logistic regressions shows that women belonging to large families show lower WPRs. In rural areas, a negative relationship was found between schooling and female WPRs, while size of the land revealed a positive relationship. Women belonging to the medium and high standard of living categories were less likely to participate in economic activities as compared to the low standard of living category. For the urban areas, years of schooling had a positive relationship with female WPRs, whereas size of the household and medium/high standard of living affected women's work participation negatively.

Srivastava and Srivastava (2010) have attempted to identify determinants of women's work participation and also explain their participation in specific types of employment using NSSO 2004-05 data. The variables used for the logistic regression analysis include age group, education, marital status, caste, religion, presence of children below five years, land holding size category, region and MPCE quintile. The results of the study indicate that women's education and autonomy helps women find better quality non-agricultural jobs and that participation in rural areas is determined by socio cultural factors.

Saha and Kalita (2015) have carried out a study to examine the labour supply behaviour of women in urban Tripura through primary survey. The study reveals the complex labour supply behaviour of women in Tripura. The study concludes that the factors having a significant and positive impact on urban women's labour supply behaviour are children above 15 years of age, marital status and number of people financially dependent on women, whereas factors having a negative impact are time spent at work and in household activities,

time required to travel to work place, monthly income etc. On the other hand, women's labour supply behaviour is not affected by the respondent's education and the education of the husband.

2.3.1. Economic Development and Female Labour Force Participation

An important explanation offered by economists for variations in women's labour force participation across nations is based on the levels of development in different countries as measured by their per capita incomes. The studies point to a U-shaped relationship between female labour force participation and level of development (Psacharopoulos and Tzannatos, 1989; Goldin, 1995). The U-shaped hypothesis suggests that at low levels of development female participation rate is high, but gradually declines with economic development, reaches a minimum thereafter which it again increases giving rise to the U shape. Countries with low levels of development and low incomes exhibit high female participation rates as they are characterised by family based subsistence agriculture. In the early stages of industrialisation, there is a decline in the subsistence sector where a majority of women are employed, with the decline in the subsistence sector being faster than the expansion of the industrial sector (Psacharopoulos and Tzannatos, 1989) leading to a decline in women's participation rates. This decline may be explained partly because of the rise in market opportunities for men relative to women and partly because of social restrictions on women's entry in the paid labor force in blue-collar jobs (Mammen and Paxson, 2000). Further, increased urbanisation which restricts opportunities for unpaid female family work, rising family incomes along with higher educational enrolments may also reduce the pressure on women to work or delay their entry into the labour force which reduces female participation rates (Psacharopoulos and Tzannatos, 1989). Later with economic development and rising incomes women's participation rates increase as a consequence of expansion of industrial and service sectors and increase in women's education (*ibid*). Decline in fertility rates reduce the burden of child-rearing and new jobs in the service sector may be available for women which are socially acceptable (Lahoti and Swaminathan, 2013) which leads to their re-entry into the labour force as shown by the rising portion of the U.

According to Mammen and Paxson (2000) many economists argue that the process of industrialization leads to "female marginalization" as mentioned by Boserup (1970) by restricting women's economic opportunities in comparison to men's, the implication being that women's lower labor force participation and their non participation in formal sector jobs reduces women's well-being. Nevertheless, whether women's well being improve or decline

as a result of development requires attention to how resources are allocated within families (Mammen and Paxson, 2000).

In this context it is worthwhile to mention the two hypotheses which have been put forward to explain the way in which patterns of FLFP are influenced by the levels of economic development in Third World countries-the modernization hypothesis and the world system perspective (Nam, 1991). According to the modernisation hypothesis, a high level of modernisation, measured in terms of economic growth is generally positively associated with a high level of FLFP. During the process of modernization, demand for labor increases, women's education and employment become socially acceptable and fertility declines (Bauer and Shin, 1987; Heckman, 1980; Standing, 1981 cited in Nam, 1991). Modernization therefore increases women's work participation and benefits women. The world system perspective also views economic growth as facilitating FLFP, the outcome however being due to the increasing marginality of lower working-class families and women's work gain importance as a supplement to household income in view of low wages. Moreover, increasing industrialization increases FLFP because industrialization in Third World countries depends on low-wage labor supplied predominantly by women, and thereby worsens the marginalized condition of working-class families as mentioned by several studies (*ibid*).

The rural areas generally exhibit higher female participation rates as compared to the urban areas. These rural urban differences in the female work participation rates in India can be explained in terms of the U-shaped hypothesis if it is recognized that the differences between the developed and the under-developed Third World is reflected in the levels of development of the urban and rural areas as mentioned by Reddy (1979).

The U-shaped hypothesis has been supported by several studies. Kamala Nath's (1970) study which analyses all-India 1961 Census data for 15 states and 311 districts of the 15 states, points out that the hypothesis of falling female work participation rate with economic development is not confirmed by the State level data but are supported by district level data. The international analysis which includes 37 countries also shows noticeable decline in female WPR with increasing income levels from countries in the lower group, to which India belongs, compared to the group with relatively higher income levels. The state level data do not support the hypothesis probably due to the fact that certain states are very large in size and may have areas which are highly developed along with areas which are poor so that the opposing influences may have offset one another while aggregating the data for the States (Nath, 1970). Lahoti and Swaminathan (2013) using state-level employment data for the period 1983-84 to 2009-10 has attempted to look at the relationship between economic

growth and women's economic activity in India. The study does not find a significant relationship between the two. The results of the study also suggest that dynamics of growth are more important in determining women's economic participation than growth *per se*.

Verick (2014) used data set for 169 countries for 2010 to examine the relationship between the log of GDP per capita (in purchasing power parity-adjusted 2005 constant international dollars) as a proxy for economic development and female labor force participation rate. The results of the study exhibited (weak) evidence of a U-shape although the nonlinear trend line is not a very good fit for the data due to presence of outliers (Verick, 2014). In the South Asian region, the relationship between income/GDP and LFPR is mixed if we take into consideration individual countries-while in countries like Bangladesh, Nepal or Pakistan female labor force participation has shown a moderate increase during the course of development, in India a declining trend has been observed with the Sri Lankan experience being mixed (Mahmud and Bidisha, 2016).

The validity of the U-shaped hypothesis, chiefly its robustness to different data sets and econometric methodologies has however been subject to debate (Verick, 2014). Psacharopoulos and Tzannatos (1989) remarked that all countries may not exhibit the U-shaped pattern and that there is a variation in the scale and amplitude of the U between countries and different periods of time. He further mentions that the labour market behaviour of women could be the result of several other interrelated factors that may even be more important than the economic effects of growth. In fact, female labour force participation is a complex outcome of a myriad of factors and cannot be attributed solely to changes in GDP per capita.

2.3.2. Female Labour Force Participation and Education

Educational attainment of women has been put forward as one of the significant determinants of female participation rates in developing as well as developed countries. The theoretical framework for explaining the relationship between FLFP and education is provided by the human capital theory. The human capital theory gives importance to education for increasing the productivity and efficiency of workers by "increasing the level of cognitive stock of economically productive human capability" which arises as a result of individuals' natural capabilities and investment in human capital for which provision of formal education may be regarded as a productive investment in human capital (Olaniyan and Okemakinde, 2008). Based on the human capital theory therefore, a positive correlation is postulated between levels of education and FLFP. Nonetheless, empirical studies in Third World countries show that the relation between levels of education and FLFP is not a simple one (Nam, 1991).

Srivastava and Srivastava (2010) opine that although education may not have a positive influence on woman's work participation, it is regarded as the most important factor that leads to better quality non-agricultural work for women who are in the workforce. They further mention that higher work participation needs to be accompanied by higher levels of education, and/or assets for improved employment outcomes and higher levels of welfare for women.

Certain studies postulate female education to influence female labour supply positively whereas others report a negative association between the two, while still others show evidence of a non-linear, sometimes U-shaped relationship especially in developing countries. Nam's (1991) study using data from the 1970 and 1980 Korean Population Censuses shows that in Seoul, Korea, women with middle school education or above were observed to be more economically active than those who were not educated. Lisaniler and Bhatti (2005) in their attempt to investigate the determinants of female labour supply in North Cyprus for the year 2001 found education to be a significant determinant of women's labour supply decision in North Cyprus with the effect of education being highest at the university and above level. Faridi, Malik and Basit (2009) while considering the impact of education on FLFP of 134 females in district Bahawalpure in Punjab, Pakistan conclude that all the education levels except basic education up to middle level have a positive and significant impact on FLFP. Another important conclusion drawn in this study is that although the educational status of parents does not affect FLFP, spouses' level of education has positive and significant effect on wives' employment. Chamlou, Muzi and Ahmed (2011) in their study of the impact of higher education on FLFP and the relationship between social norms and female labor supply using the Moroccan and Turk immigrants in Holland as a proxy for MENA (Middle East and North Africa) immigrants and Amman, Jordan, as a proxy for MENA region find that education has a strong positive impact on female labor supply, with an extra year of schooling increasing women's participation by 3 to 4 percent. However, taking the three levels of education, the study observes that secondary and levels below that do not affect FLFP, but higher education (post-secondary/university/post-university) has a positive and significant impact on it.

Gulati's (1975) study using 1971 census data for the different Indian states does not show any noticeable relationship between female work participation and literacy. The study also does not support the belief that the spread of literacy may adversely affect female participation rate in the early stages of development. The data from the socio-economic survey of urban women undertaken in Rangoon, Burma, during May to July, 1998

analyzed by the logistic regression model suggests that educational attainment does not significantly affect urban Burmese women from participating in the labour force, with the results being less significant for unmarried women than for married women (Mon, 2000). Jehan (2000) in her study on the role of women in economic development in Pakistan notes that the Pakistan Integrated Household Survey (PIHS) data shows that in rural areas education leads to a lowering of work participation rates and hours of work as number of educated women belonging to well off families in the rural areas is limited.

A strong J-shaped relationship between level of education and female participation in India is suggested by Reddy's (1979) study which uses 1971 Census data, depicting higher activity rates for illiterate females in rural and urban areas as compared to those with middle-school education followed by a steep rise in participation rates for females with educational level of matric and above, but falling in the case of ordinary graduates. In fact, Reddy talks about two "educational thresholds" for female activity rates-the first begins with matriculation and rises steeply for non-technical diplomas and reaches the peak for those with technical diplomas of less-than-graduate; and the second threshold starts with ordinary graduates who show low participation and rises steeply with post-graduate, professional, and technical education, reaching the peak in the case of medical education. The rural urban differences in female activity rates for matric and higher levels of education are almost negligible than at lower levels.

Srivastava and Srivastava's (2010) study which uses NSSO unit level data for 2004-05 shows that, in India work participation rate for illiterate women is higher than for women with higher levels of school education – a trend which is reversed only for women with technical/vocational education or graduates both in rural and urban areas; in comparison to men for whom there is a positive relation between levels of education and work participation rates both in rural and urban areas. In urban areas women's employment increases with increase in educational levels which is similar to that for men which shows a narrowing of gender gaps in urban areas.

Devasahayam's (2011, p.24) study of South, Southeast and East Asia mentions that although education increases the women's employment opportunities, gender bias continues to exist in some subjects which lead to women being concentrated in some professions and men in others. Citing Singapore's example the study states that although women took up studies in all the different subjects, larger proportions of women were found in certain subjects like education, humanities and social sciences, health sciences, and fine and applied

arts; and men in subjects like Engineering Sciences and Information Technology which were similar to the divisions observed in the West.

2.3.3. Female Labour Force Participation and Fertility

It has been argued that presence of children has an inhibiting effect on labour force participation of women since women have the primary responsibility of bearing and rearing children. Women belonging to the prime child bearing age generally have lower participation levels in comparison to women of other ages. Though a strong inverse relation between female participation rates and fertility have been observed in developed countries, such a relationship is either absent or weak in developing countries. The direction of the causal relation between the two is also ambiguous. The negative correlation echoes the “role-incompatibility hypothesis” according to which a negative relation between fertility and female employment arises since women face numerous problems in balancing between work and looking after children (Stycos and Weller 1967; Weller 1977; Narayan and Smyth 2006b, cited in Siah and Lee, 2014), the degree of which depends on the degree of incompatibility (Mehryar, Aghajanian, Tabibian and Tajdini, 2002). According to the feminist perspective, the incompatibility of work and motherhood may be regarded as emanating from the gender structures in society and the asymmetric power relations between husband and wife (Bernhardt, 1993). The economic perspective regarding the relationship between fertility and women’s employment emphasises the opportunity cost of children, according to which increase in the opportunity cost of children due to increased employment opportunities for women, will lead to decrease in fertility (Mehryar et. al., 2002). On the contrary, as pointed out by several studies, children’s presence may cause women to look for paid employment to provide for the children and family (Siah and Lee, 2014).

As suggested by several studies there is evidence of a weak link between fertility and women’s employment as a result of greater availability of child-care services, family policies e.g. maternity leave along with a change in social attitudes towards working mothers (Rindfuss and Brewster 1996; Brewster and Rindfuss 2000 cited in Engelhardt, Kögel and Prskawetz, 2004). According to the results of the World Fertility Survey (WFS) (United Nations, 1987 cited in Mehryar et. al., 2002) and Demographic and Health Surveys (Macro International, 1994, 1996, 1998 cited in Mehryar et. al., 2002) the relationship between women’s employment and fertility is not simple and linear. Several factors such as the nature of the economic activity, the cash outcome earned, and the circumstances under which it occurs, particularly the level of development of the country (United Nations, 1985 cited in Mehryar et. al., 2002) etc. may affect such relation. While women’s engagement in

agriculture or cottage industries may not lead to a decline in women's fertility, their employment in the modern and formal sectors will most likely result in a decline in women's fertility (*ibid*).

Reddy's (1979) study in India points to a "scissors relationship" between female activity rates and fertility in India for the age group of 25-49 showing that the rural female activity rates touch the peak, just as the age-specific fertility reaches the lowest among the 40-49 age group. Using macro-level time-series data from 1960 to 2000 for the developed countries of France, West Germany, Italy, Sweden, the UK, and the USA, Engelhardt et.al. (2004) find a negative and significant correlation between fertility and women's employment until the mid-1970s, after which the correlation becomes weak and insignificant. This result is in conformity with the hypothesis which posits that the incompatibility between work and motherhood may be reduced due to the institutional changes which include increase in availability of childcare and change in attitudes towards working mothers (*ibid*). Bernhardt (1993) mentions Kessler Harris' (1982) study of women in the labour force in the United States in which by examining the demographic trends she observes that women's child bearing years have reduced by nearly half, but at the same time their life-spans have increased so that women can spend more years of mature life without children or partners (cited in Bernhardt, 1993).

In the Indian economy where a large proportion of women are engaged in traditional occupations such as agriculture or home based enterprise etc. which are more compatible with child care, presence of children may not hinder women's labour force participation. However, the fact that this situation is changing in recent times due to a decline in traditional work opportunities and change in the perception of work with the spread of education, there is an upward pressure on age at marriage to raise the chances of pre-marriage work experience which offsets the negative effects of fertility on participation (Eapen, 1992).

2.4. WOMEN'S WORK AND TIME USE STUDIES

The importance of time use studies in the analysis of women's work stems from the fact that a large proportion of women's work is unpaid and undervalued albeit contributing vastly to the welfare and sustenance of the household. The implication of the invisibility or undervaluation of women's contributions is that women's status is subordinate to that of men within the household and in society. The undervaluation of women's work affects their status in society, their opportunities and leads to "gender-blindness of development policy" (UNDP, 1995, p. 87). Since women are burdened by unpaid work their ability to participate in the

labour market is constrained, which in turn limits their contributions to the income of the household reinforcing their subordinate status (Asian Development Bank, 2015, p. 5). It also means underestimation of national output. The Human Development Report (1995) states that rough estimates of all unpaid work of men and women and underpayment of women's market work at the prevailing wages stood at a staggering amount of \$16 trillion, which was about 70% more than the officially estimated \$23 trillion of global output, out of which women's invisible and non-monetized contribution was \$11 trillion (UNDP, 1995, p. 87).

Conventional labour force statistics' failure to notice women's unpaid labour encourages employing time use studies for evaluating the non-market work of women. Time use surveys provide information on how individuals spend time during the course of the day in performing different activities. Women's unpaid productive activities in the household which are omitted in traditional methods of data collection are captured by a time use survey which helps in estimating women's real workload (United Nations, 1991, cited in Bhatia, 2002). From a gender perspective, therefore, time use surveys are significant in drawing attention to the nonmarket work mostly performed by women (Asian Development Bank, 2015, p. 3) which help in policy formulations leading to greater gender equality (Hirway, 1999).

The advent of time use analysis may be traced to the early 1900s when they were used for the first time in social surveys to report on the living conditions of working class families. In countries where industrialization was in progress there was a growing concern about the proportions of work and leisure in the daily life of labourers due to long working hours, and organized labour advocated for the shortening of the working day (ed. Szalai, 1972, cited in United Nations, 2005). Beginning in the 1920s, time use studies were carried out in UK, the centrally planned economies and in USA for various purposes like development and community planning in the centrally planned economies, understanding the effect of new technology on the time use of farm homemakers in the USA, getting new insights into psychological and social motivations, the problem of commuting and the length of commuting time. Encouraged by the field of "new household economics" which focused on the unpaid household activities as being a part of productive activities, developing countries also started conducting time-use studies in the 1970s for development planning purposes (Asia Society 1978, cited in United Nations, 2005) concerning (a) the utilization of women and children as important human resources in the household, and (b) improving the

measurement of employment, unemployment and underemployment (United Nations 1990, cited in United Nations, 2005).

In India one of the earliest time use survey was carried out by Devaki Jain and Malini Chand in three villages each in Rajasthan and West Bengal during 1976-77 (Hirway and Jeyalakshmi, 2007). A time-allocation study on a sub-sample of Employment and Unemployment Survey conducted in the 38th Round (1983) of the National Sample Survey Organisation was also carried out in 1983 by the National Council of Applied Economic Research (NCAER). A pilot survey on time-use was also conducted by the Directorate of Economics & Statistics, Government of Tamil Nadu during 1996 (Gupta, n.d.). India conducted its first national time use survey on a pilot basis in 1998-99. The survey included six major states in India from six major regions: Haryana from North India, Madhya Pradesh from Central India, Tamil Nadu from South India, Gujarat from West India, Orissa from East India, and Meghalaya from North-East India (Hirway and Jeyalakshmi, 2007). Several time use surveys have also been carried out at the micro level for proper evaluation of women's work.

Time use data from industrialised as well as developing economies suggest that women spend more time in unpaid non-SNA (System of National Accounts) activities vis-a-vis men who expend more time on paid SNA activities (Chakraborty, 2007). The Human Development Report, 1995 and 2000 data for industrialised economies reveal that women's share in non-SNA activities ranges from 61 per cent of total work time in Canada to 81 per cent in the Netherlands; while male's share in non-SNA activity ranges from 21 per cent in Denmark to 48 per cent in the Netherlands. The proportion of total time spent on non-SNA work by women in developing countries ranges from 76 per cent in urban Columbia to 52 per cent in the mountainous region of Nepal. The proportion of time spent by men in non-SNA activities is as little as 13 per cent in urban Venezuela and 14 per cent in urban Indonesia (*ibid*). A study conducted in Indonesia in 2004 shows that women spent about 6 hours working for business, 3 hours cooking food two times a day, 2 hours cleaning the house and yard, and about 1 hour for washing clothes, collecting water and firewood, going to the market, animal caring, and community gatherings respectively (Gagliardone, 2015). The Report of the OECD (2011) on Asia and the Pacific found that total work time which included paid, unpaid, market and nonmarket work was not uniform across the region, with the highest in Mongolia (10 hours for men and 11 hours for women) and lowest in Cambodia (6 hours for men and 7 hours for women) with women's total work time being consistently longer than men's and men spending consistently more time in market work as compared to

women who spent more time in non-market activities (Asian Development Bank, 2015). As reported in the International Labour Organisation's (ILO) Global Employment Trends 2012, taking a sample of 35 countries, Berniell and Sanchez-Paramo (2011) (cited in ILO, 2012) find variations in time spent on housework by women, with women spending 30 per cent more time than men in Cambodia and 6 times more in Guinea. Despite these regional variations, the fact of the matter is that women all over the world spend more time on housework as compared to men. It is therefore crucial that time-use be made more equal between men and women for achieving gender equalities in the labour market and elsewhere (ILO, 2009, cited in ILO, 2012).

Bhatia's (2002) study using the time use survey data conducted by Central Statistical Organisation (CSO) for 1998-99 shows that while the average time spent by an average man in a week in doing work is nearly 45 hours, the average time spent by an average woman is over 53 hours a week. Although women are found to spend a large portion of their time (20.61 percent) on extended SNA activities as compared to men whose contribution is much less (2.17 percent), their contribution in SNA activities is also quite significant (11.14 percent) albeit lower than that of men who spend a larger percentage of their time on SNA activities (24.98 percent).

In 2011-12 time use survey was conducted on a sample of 200 households in rural Punjab. The results reveal that women spend only 4.9 percent of their time on SNA activities as opposed to men who spend 22.6 percent. However, they spend 56.6 percent of their time on non-SNA activities and 38.5 percent on extended SNA activities due to greater family responsibilities. In a week, women spend about 17.4 hours for cooking, 9.3 hours for taking care of guests and visitors and 7 hours for cleaning, washing clothes, and taking care of children respectively. The results of the time use surveys in India clearly show that women are predominantly involved in subsistence production and informal jobs both in rural and urban areas, with their work being "scattered, sporadic and poorly diversified", and they spend long hours in unpaid SNA and non-SNA work. This requires policy changes to achieve the objectives of gender equality (Gagliardone, 2015).

2.5. WOMEN'S WORK AND WAGE DIFFERENTIALS

Women's paid work is generally used to gauge women's progress and their status in society. Nevertheless gender gaps in wage earnings persist as is evident from several studies with women's earnings being lower than that of men. The global gender wage gap is estimated to be 23 per cent; which means that women's earnings are only 77 per cent of men's earnings

(ILO 2016, p. xvi). The gap between women's and men's median earnings was estimated at about 20% in Turkey compared to an average of 14% in 24 European economies as revealed by OECD data (cited in UNESCAP, 2016). In India, women's estimated earnings are found to be 10-15% less than men after considering education and work experience (Bhalla and Kaur, 2011 cited in *ibid*).

In the neoclassical framework the human capital theory and the theories of discrimination are used to explain women's lesser earnings in comparison to that of men. Gender ideologies which define the roles for men and women and the type of tasks they perform may also provide justification for the gender gaps in labour market opportunities and wages for women. The gender gaps in wages cannot be linked only to variations in education or age, but may also be the result of less valuation given to women's work and of the skills required in female-dominated jobs, discrimination, and the intermittent nature of women's work (ILO, 2016, p.xvi).

Agarwal (1989) delineates a number of reasons for the disadvantaged position of women in their access to employment and earnings in comparison to men. The reasons are: (a) lesser mobility between jobs due to responsibility of childcare, female seclusion, and women's vulnerability; (b) limited information on job opportunities due to lower literacy, lesser access to mass media, and less interaction with the market place; (c) confinement to casual work in agriculture; (d) lower wages for the same tasks, due to the ideology regarding women's work being supplementary and less productive, and by the lack of unionisation among female workers; (e) the form of payment; and (e) exclusion from machinery which raises productivity, since the induction of such machinery leads to women's displacement as they are not trained to use them and therefore remain confined to manual task. These factors are found to be important in relation to agricultural work as well as non-agricultural work both in the informal and formal sector (Agarwal, 1989).

According to Chattopadhyay (1982) micro-type empirical studies on agricultural labour reveals that besides the difference in wage rates between male and female labour, there are several aspects of the terms and conditions of the employment of male and female labourers like duration of employment, the basis and means of payment, wages, nature of work, labourer's dependence on employer and so on which call for a more meaningful distinction between male and female labour. Apart from secondary data his conclusion can be justified with the data collected from the villages surrounding Sriniketan, Birbhum, West Bengal, during the year 1976-77 which points to a customary division of labour between the sexes with respect to certain operations such as interculture and transplanting, winnowing etc.

On the basis of data on agricultural wages in India for 1964-65 to 1980-81 Nayyar (1987) observes that the male wage rate exceeded the female wage rate quite sharply for all agricultural operations considered together and separately, though a slight narrowing of the differential was observed for India between 1964-65 and 1974-75. However, despite lower wages for women workers, employers have a preference for male workers due to socio-cultural prejudices preventing women's free participation in productive work (Nayyar, 1987).

According to the Rural Labour Enquiries (RLEs) of 1964-65 and 1974-75, Agarwal (1989) notes that female annual earnings are consistently lower than male's for both the years, and is less than half in 5 out of the 14 states examined, and almost half in most of the others in 1974-75. She further notes that the absolute differentials are higher in the north-west as compared to other regions and highest in the Punjab. When the total wage earnings, both agricultural and non-agricultural work were considered, the gender differentials were even greater in both the years. The inter-regional changes in the differences during the period were also found to be similar to those observed for agricultural earnings alone (Agarwal, 1989).

Barua's (2010) study was carried out in two districts of West Bengal, including the advanced district of Nadia and the backward district of Jalpaiguri, between May 2006 and February 2007. The study reports existence of wage variations among male and female agricultural labourers with lower daily wages for female agricultural labourers as compared to their male counterparts. According to most agricultural labourers the low wage rate for female agricultural labourers was attributed to the fact that the work done by female agricultural labourers involved less physical activity.

Using different Rounds of NSSO data, Sharma and Saha (2015) show the presence of gender gap in average wages between male and female workers. The study further mentions that the wage gap between rural and urban women have widened between 1993-94 and 2011-12 whereas the differentials are not so striking for males which puts the male workers in a comparatively better position than female workers (Sharma and Saha, 2015).

Sundar (1981) opines that the lower wages paid to women cannot be attributed to women's lower productivity, but is the outcome of "cultural attitudes and practices and power structures in a society", and also depends on the nature of their respective supply functions. In agriculture, the gender wage gap can be attributed to a segregation of activities undertaken by men and women that partly justifies the wage gaps between them (Chakraborty and Chakraborty, 2009).

The presence of the gender pay gap shows how women's work is valued, and often reflects gender discrimination and occupational segregation of women workers in certain

types of activities where the work and skills of women are undervalued (ITUC, 2008, p. 47; Srivastava and Srivastava, 2010). The undervaluation of women's contributions which may be because of her gender, is evident not only within the family but also during policy formulation and implementation of development programmes and reinforces gender related deprivation (Agarwal, 1997). This undervaluation of women's contributions is not confined to developing countries. In the Western world, feminists raised the issue of "wages for housework" by recognizing the invisibility of unwaged work which was regarded as having little value. From studies of American households Paula England and Barbara Kilbourne (1990) argued that the bargaining power of women who earned cash was more than that of housewives due to housework being regarded as less valuable; and women's intra-family bargaining power could be increased through their participation in wage labour (see also Sen, 1990) (cited in Agarwal, 1997).

2.6. WOMEN IN AGRICULTURE

Women contribute significantly to agricultural production, nonetheless the nature and extent of their involvement varies across class, caste, type of crops, farming systems etc. Measurement of female participation in agriculture depends upon the range of activities included as part of agricultural production and agricultural work needs to be defined broadly to capture women workers (Unni, 1989) since a lot of activities performed by women in agriculture-based subsistence economies may be subsumed as domestic or household work. Of the several studies conducted on women and agriculture in India and other developing countries most point to the fact that women's contribution to agricultural production is much more than they have been given credit for (Sardamoni, 1987; Krishnaraj and Kanchi, 2008). In the last few decades women's role in agriculture has expanded as more men move out of agriculture to join other sectors, and agriculture is being increasingly dependent on women, although an Indian farmer is perceived to be primarily male (Krishnaraj and Kanchi, 2008, p.1).

Ester Boserup's (1970) pioneering work distinguished between the male and female farming systems with the male farming system being found in densely populated regions characterised by extensive plough cultivation, and female farming system in sparsely populated regions where shifting cultivation is practiced. Boserup suggests that female seclusion will be found in plough cultivation where requirement for female labour is less as compared to wet rice cultivation where female labour is important and as such not subject to seclusion. Similar views have been expressed by Moore (1973) (cited in Miller, 1982).The

gendered nature of farming activities can be observed even today in farming systems the world over with the gender roles varying across different farming systems, the type of crops cultivated etc. The dichotomy in men's and women's jobs or "market segmentation" in agriculture clearly depicts that women are invariably confined to the jobs which are poorly paid, low technology and inferior (cited in Nayyar, 1987). Further, where men and women perform the same tasks, the males receive a higher wage than the females (*ibid*).

In India, agriculture is the primary activity for the women in the rural areas. The 2011 Census records 65 % of total women workers to be engaged as agricultural workers. Significant variations among states are nonetheless evident. Ghosh and Mukhopadhyay (1984) in their study of female in the Indian labour force using 1971 and 1981 Census data have stated that the inter-state difference in female work participation rates may be explained by the differences in the pattern of female labour used in different types of cultivation with rice growing states like Kerala, Maharashtra, Tamil Nadu and West Bengal using female labour more intensively which is in sharp contrast to states like Punjab or Haryana growing mainly wheat or millets under irrigated conditions. The study further states that even among the rice growing states variation in work participation rates has been observed. Gulati (1975) also supports the view that more women are involved in cultivation of rice as compared to cultivation of crops like wheat which require more physical labour. Nayyar (1987) however notes that the eastern states of India, especially West Bengal, in spite of being a rice growing state and having high incidence of rural poverty, both of which should induce high female participation are characterised by low female participation rates, which could possibly be explained by non-economic factors.

Agricultural labourers constitute a significant section of rural workers in India. They belong to the lowest rung of the socio-economic ladder yet they do not form a homogeneous group. Female agricultural labourers bear an even heavier burden of poverty and workload by virtue of their gender. Reddy (1979) states that while the work burden of the male worker for the day generally ends with the period of wage employment, that of the female agricultural worker extends beyond the field and into the household (Reddy, 1979). Using Census data for the period 1961-1981, different rounds of NSSO data from 1956-57 to 1983 and Agricultural and Rural Labour Enquiries data for 1974-75 Unni (1988) notes that on the whole there is a trend towards an increase in the percentage of casual workers and the proportion of agricultural labour households over the entire period. The study mentions that the percentage of agricultural labour household among all rural households for the country as a whole increased from 22 per cent in 1964-65 to 31 per cent in 1983. He further mentions that the

proportion of agricultural labourers in the workforce is likely to increase due to two main reasons- (a) agricultural development and increase in productivity of land, and (b) the division of households along with fragmentation of holdings with an increase in the number of economically unviable holdings which cause such farmers to hire out their labour for supplementing family income or join the ranks of agricultural labour. In the recent Indian Census data i.e. from 2001-2011 an increase in the proportion of agricultural labourers among total and rural agricultural workforce has been observed for both men and women. For male workers, growth rate of agriculture labourers in the marginal workers category is significantly higher than for main workers category which is the other way round for the females (Venkatanarayana and Naik, 2017) which is an indication of casualisation of the rural female agricultural workforce.

In rural India women belonging to the category of landless agricultural labourers and marginal and small farmers are forced to search for jobs to supplement family income due to their low levels of per capita income and landlessness while low wage rates discourage women of high income families to participate in economic activities which has been termed as the “discouraged worker” effect (Nayyar, 1987). According to Reddy (1979) the “discouraged worker” effect also occurs due to high density of population in the rural areas, where competition between men and women generally drives women out of the labour force as men are usually preferred to women. The participation of agricultural labour particularly women and their entry and exit from the workforce depended on the income levels of the household which is fluctuating and unstable. This implies that the primary reason for women’s participation appears to be the economic benefits to household through women’s increased participation (Unni, 1988). In this sense women’s participation may be regarded as distress participation. Seasonality also affects the female participation rates more than male participation rates since women withdraw first from the labour market in order to give males an opportunity to find work first which has been termed as “sexual dualism” (Nayyar, 1987). Seasonal employment of women labourers has been supported by various studies.

A study of Farm Management Reports of Madhya Pradesh (1956-57), Maharashtra (1967-68) and Assam (1970-71) was carried out by Chattopadhyay (1982) in which he observes that, firstly there are some types of agricultural operations (e.g., harvesting, interculture and transplanting) for which female labour is preferred by employers due to the nature of the work as they can be paid lower wages, and secondly females are preferred to males for certain operations in those areas where cultivation is highly non-mechanised.

Nisha's (2008) study on 120 women labourers in agriculture in Palakkad district in Kerala shows that maximum employment was obtained by the women labourers in agriculture during *kharif* (57.62 days) and *rabi* season (54.91 days) with highest employment measured by the number of days in weeding (46.28 days) next only to harvesting and post harvest operations (36.90 days). With the exception of harvesting and post harvesting operations, for all other operations they received wages in cash. The women labourers were unemployed for maximum days in summer (110.04 days).

Sengupta's (2012) study of investigation of the correlates of work participation of women cultivators and women agricultural labourers in the districts of West Bengal during the post reform period reveals that for women cultivators, the significant explanatory variables are 'percentage share of irrigated area in net sown area in a district' and 'urbanization index of a district', whereas for women agricultural labourers, the significant explanatory variables are 'percentage share of working-age women population in total rural women population in a district', 'cropping intensity of a district' and 'percentage share of irrigated area in net sown area in a district' throughout the whole period.

Kerur (2014) conducted a study of agricultural labourers in Bijapur district of Karnataka. The study concluded that out of the total employment in agriculture in a year, women agricultural labourers got 46.25 per cent during the *kharif* season, 42.40 per cent during the *rabi* season and only 11.35 per cent employment during the summer season with least employment in the month of May. Women labourers got on an average Rs. 12,195.00 in *kharif* season, but in summer season women labourers received only Rs. 3,180.00. According to the women agricultural labourers, poverty was the main problem followed by off season unemployment, lack of alternative sources of employment, non-availability of MGNREGA jobs, indebtedness, discrimination in wages, low wages and illiteracy.

Murugan's (2014) study of agricultural women labourers in paddy cultivation in Thoothukudi district of Tamil Nadu reveals that in all the three farm sizes in the study area two-thirds of the farm activities were undertaken by females and one-third by males with women being involved in activities like transplanting, weeding and harvesting and men in ploughing, spraying and manuring. The study also points out that women received only half the wages received by men despite working for a greater number of mandays than men. Women's seasonal unemployment in agriculture has severely impacted the income, expenditure, savings and debt position of the labourers.

Agricultural labourers despite being the backbone of Indian agriculture have not been provided with work which would enable them to earn sufficiently throughout the year, which

along with lack of maternity, child and health care facilities points to the fact that agricultural labourers may have been overlooked in development planning (Sardamoni, 1987).

2.6.1. Women and New Technology in Agriculture

The agricultural prosperity as a consequence of the new technology in agriculture which included high yielding variety (HYV) seeds, mechanical equipment, etc. had significant effects on the Indian economy. The new technology impacts men and women in different ways since the extent and nature of involvement of men and women in agricultural field work, non-field work, including cattle rearing, domestic work and child care, etc. and the extent of their control over and pattern of distribution of household earnings and of consumption items may be different (Agarwal, 1984).

As mentioned earlier agriculturally prosperous regions have been associated with lower female participation rates. The increases in household income due to prosperity in agriculture brought about by the new technology or the Green Revolution led to withdrawal of marginal workers, i.e., women, children, elderly men from the labour force due to the “discouraged worker” effect causing women to devote more time to their homes, children and education leading to a decline in their participation rates as corroborated by studies especially in agriculturally advanced states like Punjab and Haryana (Reddy, 1979; Chattopadhyay, 1982; Nayyar, 1987). It may however be noted that although there is a substitution of women’s field labour by hired labour with increase in family income due to family status, women’s work within the household such as cooking etc. cannot be substituted by hired labour even in the households who are economically well-off, which implies that although women may withdraw from working in the fields they are required to spend more time on non-field related work (Agarwal, 1984).

The change in use of human inputs to technical inputs brought about by the Green Revolution led to a marginalisation of women’s work as their roles in agriculture shifted from being regarded as primary producers to being regarded as subsidiary workers. Mechanization of agriculture, an important characteristic of the Green Revolution may lead to “gender discrimination and class polarization” as women from subsistence and marginal households are displaced (Mallaiah, 2009). Although mechanisation led to displacement of agricultural labourers, it was likely the first ones to be displaced were the more marginal workers which included children, elderly men and women with adult males remaining for the longest time (Billings and Singh, 1969). It has been observed that where manual labour is replaced by the introduction of machines women may lose their jobs as they are primarily responsible for undertaking the manual tasks while men get the new jobs of operating the machines

(Mallaiah, 2009). Dhillon's (1980) study on the changing role of rural women in Ludhiana District of Punjab found that women's contribution to agriculture was declining as they were incapable of dealing with the technological advancement, and they continued doing certain monotonous farm activities related to harvesting and processing of food-grains. Mencher and Sardamoni (1982) in their study of female agricultural labour in rice producing villages in Kerala, Tamil Nadu and West Bengal mention that the introduction of any technology or innovation in paddy cultivation would lead to a loss of employment opportunities for women, which in the absence of alternative employment opportunities create more hardship for them. Achanta's (1982) study reveals that in villages where agriculture is modernised, a decline in women's economic activities has been observed as compared to villages where traditional farming is still in use as they are not able to cope up with new innovations in agriculture. The study mentions that this is partly due to negligence of extension personnel to organise training programmes for women, and partly due to conventional view that women and machines do not go together. During the last half of the 1970s the share of women workers declined due to the result of certain changes in agriculture such as the use of chemical fertilisers instead of manure, and introduction of weedicides which narrowed down the range of activities previously performed by women considerably, while new activities such as spraying of pesticides etc. which involved the use of machinery, were allocated to male workers (Bhalla, 1989). Gupta and Maiti (2008) note that in eastern Uttar Pradesh, use of machines like combine harvester threw women out of jobs and led to a decline in the number of working days for them during the harvesting season.

Basant (1987) notes that the new technology along with its various components has led to an increase in the share of hired labour relative to family labour and male labour relative to female labour. As regards the additional demand for hired labour which rose due to the intensive nature of the new technology, Bhalla (1989) notes that given the fact that Indian agriculture is characterized by surplus labour, the introduction of the HYV technology which raises the demand for hired labour reduces the female share of field labor days as the vast majority of hired labour days are supplied by male workers, and that the share of female labourers is likely to increase only if there are bottlenecks with regard to male labour supply. She further notes that the hired female labour days per acre figures rose from about six days to about nine days per acre only in regions with a less adequate supply of male labourers (Bhalla, 1989). Evidence also indicates that the adoption of the HYV package in India led to greater usage of hired male labour with women being employed only when there was a shortage of labour and for specific operations like cotton picking, increasing the unpaid

family labour days for women. In instances where women are engaged as wage labour their wages are lesser than those paid to male workers and hardly above the subsistence level (Kak, 1994).

Yet, certain studies point to the increase in the use of casual hired female labour due to the introduction of the new technology. Regarding the effects of new agricultural technology, particularly High Yielding Variety (HVY) rice on female employment in three principal rice-growing states, viz, Andhra Pradesh, Tamil Nadu and Orissa, Agarwal (1984) notes that the adoption of HVY rice tends to increase the use of both male and female casual labour time. The impact on the use of female family labour is however clearly not predictable in all the three states due to the fact that on the one hand the use of HVY rice increases the requirements of farm labour which induces intensive use of female family labour, on the other hand, the increase in family income leads to a withdrawal of women from manual field work due to family status. Increased absorption of female labour per unit of land especially under HVY paddy at least in the early years have been documented by several studies as mentioned by Krishnaraj and Kanchi (2008, p. 109). Joshi and Alshi's (1985) study regarding the impact of HYVs on female labour employment in Akola district of Maharashtra state also reveals that the requirement of casual hired female labour increased considerably due to the adoption of HYV of cotton and jowar- about 157 per cent more female labour per hectare in HVY cotton farms over local variety, and 26 per cent more female labour in HVY jowar crop over local variety. Chand, Sidhu and Kaul's (1985) study in Punjab revealed that modernization of agriculture has led to an increase in the employment per hectare of cultivated area for all kinds of female labour and a decline in the differences in the male and female wage rates.

The impact of Green Revolution on female employment has presented mixed results. Studies conducted especially in the post eighties period do not lend support to the argument that technology adversely impacted female labour force participation, and neither to the phenomenon that casualisation nor unemployment was specific to technologically advanced states (cited in Krishnaraj and Kanchi, 2008, p. 109-110). Nevertheless, there are studies which point to the contrary. Krishnaraj and Kanchi believe that "the conclusion arrived at appears to be largely dependent upon the vantage point in terms of the time that has elapsed between the introduction of a new technology and the assessment of its impact".

2.6.2. Women's Work in Hill Regions

Hill and mountain regions are some of the least developed regions of any country owing to harsh climatic and environmental conditions, remoteness and difficult access. Among the

poorest and most disadvantaged people in the world is the mountain community who is confronted with political, social and economic marginalization and lack access to basic services such as health and education. Moreover, they are distantly located from the centres of commerce and power, as such they have little influence on the policies and decisions that impact their lives, and their voices often go unheard (FAO, 2011). Women in these regions especially those in the rural areas therefore face marginalization twice over, firstly by virtue of the marginalized environments in which they live and secondly by virtue of their gender. Although high rates of female labour force/work participation have been observed in hill and tribal belts it has been noted that most of these female workers are family farm labour, not wage labour who are required to work in the field and manage farms as male labourers tend to migrate. The major constraint faced by women looking for wage employment in the hills is the overall scarcity of jobs (Chen, 1989; Roy and Tisdell, 1993). Besides male-migration which causes women to work on and manage farms, low levels of class hierarchy in the hills relative to the plains is also the reason for the limited use of hired labour (Chen, 1989). In Nepal, the decade long armed conflict, which started in 1996, could have led to extra work for women as they were left alone to look after their families as heads of household and sole bread winners due to family separation, husband's death, displacement of men, migration and disability (Menon and Rodgers, 2011). The high work participation of women in the hill regions however, does not indicate better life, "it only depicts their servitude to the hard economic life of their habitat" (Pande 1996, p.32).

Historically, women's labour has been crucial for the sustenance of the hill village economy (*ibid*, p.23). Women in rural households of the hill regions contribute a lot to farm activities as highlighted by several scholars with some studies reporting some tendency towards sexual division of labour in agriculture, rearing of farm animals and household activities. These studies have brought to light women's roles in productive activities in mountain farming systems measured both in terms of the number of women working and the number of hours worked.

Bhati and Singh's (1987) study of total labour inputs of 120 farm households in Himachal Pradesh finds that women's labour accounts for 61 percent of the total farm work in comparison to men's 39 percent with women's participation being greater in tending of farm animals. There was some gender division of labour in agriculture with men specializing in heavy and seasonal work and women in light and regular work. The study further observed that on an average the time spent by a woman and a man on farm work was 3.52 and 3.70

hours per day respectively. Given the fact that women also perform household tasks, it leads to longer working hours for women.

Thakur (1991) carried out a study regarding the nature and pattern of farm female workers' employment in the rural areas of Himachal Pradesh. The study exhibits the differing amount of time spent by women in productive and necessary activities according to the size of the holdings. The percentages of female worker days spent in productive activities were found to be 54.61, 56.93 and 57.42 on the marginal, small and medium size of holdings respectively, which shows that women's involvement in productive activities increases with an increase in the size of the holdings. However, for necessary activities, the percentages of female worker days were found to decrease with an increase in the size of the holdings, the percentages being 44.61, 41.84 and 41.55 for marginal, small and medium size of holdings respectively.

Pande (1996) in his study of women of hill region of Garhwal and Kumaon divisions of Uttarakhand (which was formerly a part of Uttar Pradesh) points out their significant contributions in all agricultural and animal husbandry operations. The hill women in the study area devote about 16.49 hours on an average day for performing different types of activities which have been categorized as outdoor, indoor and leisurely and recreational activities. Maximum time is spent by women in collection of fodder, fuelwood and water (32.8 percent), followed by agriculture and animal husbandry (29.35 percent), indoor household activities (29.08 percent) and leisurely and recreational activities (8.77 percent).

Ishaq and Farooq's (2006) study found that women in the Northern mountains of Pakistan participated actively in different activities such as sowing (except maize), thinning, weeding/hoeing, transportation of inputs to the fields (except for wheat) along with its application, irrigating the fields, harvesting and grading of potato; besides being involved in management of fruit plants i.e. in weeding/hoeing, transportation and application of inputs, irrigating the fields, picking, grading and drying of fruits such as apricots, almonds, walnuts and mulberries, and cracking of walnuts and almonds. Quite often women's time allocation to these tasks is more than men as they participate in all activities related to crop production besides undertaking the normal domestic chores of cooking, looking after children, elderly and infirm, fetching fuel and water, cleaning and maintaining the house etc. The high involvement of women in farming was due to the fact that male members were attending educational institutions or were out for a job. Women however had no role in marketing, and the selling of all the fruits and potatoes was performed by the male member of the household. Women were also actively involved in livestock raising. It was observed that 88% of the

females were involved in cutting fodder for livestock, 64% in grazing livestock in summer and cutting grasses, 68% in cutting and collecting thorny bushes and 100% in feeding and milking the livestock.

Rahman, Karuppaiyan, Kishore and Denzongpa's (2009) study of traditional practices of ginger cultivation in Northeast India mentions that although men and women were found to be doing almost all types of work from land preparation to seed storage, their roles were determined more by family situation than by gender or ethnicity. Women work equally with men in families with fewer men as compared to families with more male members. Ploughing is generally done by men whereas hoeing and digging are done by both men and women. Activities such as sowing, planting, manure extraction and harvesting are done by both men and women, while mulching is done mostly by men with help from women when required. Weeding is however done exclusively by women. In the northeastern state of Sikkim extraction of mother rhizome is done by women but selling is done by men. Women in Mizoram, Meghalaya and Nagaland take part in retail selling of ginger.

Sidh and Basu's (2011) study of women's contribution to household food and economic security in the Garhwal Himalayas in Uttarakhand shows evidence of gendered division of labour within households with men being engaged primarily in paid work and certain specific tasks in fields and within the household such as planting paddy, market-related work, taking children to school, grazing cattle and major repair work at home. Women however shoulder greater responsibilities working in and outside the household and perform most of the activities related to agriculture, animal husbandry, fetching fuel wood, water etc. and other household activities. Since most of women's work is not marketed it does not earn income for the family. The study also observes that even among the women, the hours of work and the nature of work depend on their social status i.e. daughter, daughters-in-law or mothers-in-law with daughters-in-law having to work longer hours than their mothers-in-law and unmarried girls.

Moktan and Mukhopadhey (2012) conducted a study in the hill district of West Bengal to examine the level and extent of women's work in agriculture. Using a sample of 300 farm women the study concluded that the farm women of different farming categories participated in all the identified agricultural activities to a great extent. Women participated mostly in activities such as transplanting and intercultural operations. The other activities performed by marginal and small-medium category farm women were uprooting of seedlings, bringing seedlings to the main field, land preparation, harvesting, seed sowing, processing of farm produce and manure and fertilizer application. The results show that the mean

participation level of women was in more than 10 agricultural activities with a total mean of 10.42 and the total mean annual participation hour was 1366 hours per year.

In recent times, climate change and environmental degradation is one of the most important global challenges affecting mountain ecosystems (FAO, 2011). The loss of forest and water resources as a consequence of the climate change have an adverse impact on the lives of mountain women as they now need to travel longer distances to meet the family's requirements of fuel wood and water. Singh's (2005) study in Kinnaur district of Himachal Pradesh shows that women allocate 80 per cent of their work time as compared to men's 20 percent in the collection of forest-based resources like leaf litter, fuel wood, fodder and non-timber produce especially medicinal herbs and some wild edibles like mushrooms which is strenuous and requires working in inhospitable areas of the forest; whereas men are relatively more engaged in seasonal collection of minor forest produce particularly medicinal herbs. Since women have a rich indigenous knowledge of forest based resources, depletion of forests also results in destruction of relevant knowledge that women have been gathering since generations (cited in Singh, 2005). According to the FAO (2011) climate change and environmental degradation can lead to food deficits, increasing rate of outmigration and trafficking of mountain girls and women to lowland cities (FAO, 2011).

An important issue related to women's participation in agriculture is the issue of ownership of productive resources. A pre requisite for achieving higher and better quality of agricultural production is effective rights for women in agriculture, along with essential inputs and credit support as this will lead to efficient use of resources, besides enabling women to control the use of household income for their own well-being and the well-being of the other members of the household (Kelkar, 2010). According to Maskey (1993), studies in eastern Nepal found that among those attending extension demonstrations only 12% were women, and among those attending agricultural training programs mere 5.1% were women (cited in Gurung and Gurung, 2001). It has also been found that compared to hill and mountain regions, women from the flatlands of Nepal (Terai) had 4.5 times more contact with extension and training services (Shrestha et. al. 1984; Kiff 1991; Maskey 1993 cited in Gurung and Gurung, 2001). As regards the ownership rights of the domestic animals, Dwivedy's (2014) study of female labour in farming sector in Sikkim shows that in contrast to men, women in the study area did not own bullocks, but owned cows and pigs although fewer than men and more of small animals i.e. goats and poultry. Further, only 7% of female sample farmers had ownership of land (Dwivedy, 2014). The lack of ownership of cattle and inequality in access to land and other production resources have led to women's poverty and

socio-economic insecurity (*ibid*). Even within the household the patriarchal norms require that a woman feed her family first, especially the males and children before partaking of her food. This intra household inequality in access to household resources increases the risk of poor nutrition for women and girls with adverse impacts on their health. The ownership of productive resources is an important determinant of the power relations within the household with women owning assets having a higher bargaining power and more say in household decision-making than other women.

2.7. CONCLUSION

The present chapter has provided a review of literature on women's labour force/work participation on crucial related issues. Globally there is underutilization of the labour resources of women with the female participation rates being lower than male participation rates in major regions across the globe. Although a narrowing of gender gaps has been observed in certain regions, women's positions are far from satisfactory with majority of them being employed in informal jobs which are low paid having little or no social security. Women in rural areas in developing countries in particular are involved as unpaid family labour on family farms with little or no visibility in national income statistics. Studies in India express concern about the declining trend in female labour force participation in the recent decade and try to provide explanations for this phenomenon.

The chapter also reviews studies on determinants of women's labour market decisions with primary focus on the relations between women's labour force participation and economic development, education and fertility. Not being determined by a single factor, women's labour market decisions are complex and vary across different regions, class, cultures, and societies etc. making generalisations hard.

Review on time use studies that have been undertaken to capture women's unpaid work points to the larger work burden of women in terms of time spent in different activities, with women expending more time in unpaid non-SNA activities vis-a-vis men who expend more time on paid SNA activities. Where women participate in paid work, studies undertaken in several countries have drawn attention to the gender gaps in wage earnings with women earning only 77 per cent of what men earn. The gender gaps in earnings reveal gender discrimination and occupational segregation of women workers in certain types of activities where the work and skills of women are undervalued.

A review of women's role in agriculture reveals the high involvement of women in agricultural activities although the extent of their involvement varies across different regions, cultures and farming systems. In recent decades with men moving out of agriculture, a trend towards feminization of agriculture is being observed in the rural areas. Studies also point towards the seasonality of women's employment in agriculture which implies that women's participation is largely distress participation. The advent of the Green Revolution or new technology in agriculture had different impacts on men and women's employment. Most of the studies mention that women have been displaced due to the introduction of the new technology as many activities have been mechanized and men have taken over many of the mechanical tasks. Studies on women's work in hill and mountain regions reveal relatively high work participation of women vis-à-vis the lowland areas which has been attributed largely to men's out migration. The studies also reveal their active participation in different farm activities including livestock rearing besides being involved in domestic and household chores. Nevertheless, women face several constraints in access to productive resources as understood from several studies.

From the literature presented in the present chapter it becomes clear that the position of women in society is one of disadvantage and inequality. To achieve gender equality and to make development more inclusive for women gender mainstreaming is an important strategy which has been ignored in development policies. Despite the increasing awareness on gender issues and the realisation of the gender dimension of development, the extent to which gender issues have been included in development policies and translated into practice is still very limited. The problem is even grave in mountain areas which experience deprivation and marginalization in several aspects, and where women's involvement in agriculture and natural resource management is relatively high as compared to other areas. Conscious efforts at all levels and sensitiveness during policy making and implementation are crucial in formulating strategies for effective removal of gender bias. The strategies adopted need to take into account the variability across areas, groups, environments and region specific needs for sustaining development and inclusive growth.

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Chapter III

Darjeeling Hill Region- A Brief Introduction

3.1. INTRODUCTION

The district of Darjeeling is the northernmost, smallest and the only hill district of West Bengal and is located between 27° 13' and 26° 31' North latitudes and 88° 53' and 87° 59' East longitudes (Census of India, District Census Handbook, Darjeeling, 2011). The district accounts for 3.55% of the total area and 2.02% of the total population of the state according to the Census 2011. The district is distinctly different from the other districts of West Bengal in terms of its history, geography and ethnicity hence deserves special attention and policy formulation in comparison to the other districts. The present chapter intends to provide an insight into the various aspects of the Darjeeling district in terms of its history, geography, economy and demography. At the time of undertaking the present study, Kalimpong was a sub-division of Darjeeling district. It was constituted on 14th February 2017 as the 21st district of West Bengal. Since no separate secondary data exists for Kalimpong district all the data in the following analysis pertains to the former district of Darjeeling (including Kalimpong sub-division).

3.2. HISTORICAL BACKGROUND

Though the history of the Darjeeling Hills “cannot be independently traced back to any significant period of time”, it may be construed that even before the formation of the Kingdom of Sikkim it had always been a part of the Himalayan kingdom of Nepal (Roy, n.d.). The Kingdom of Sikkim however claimed sovereignty to the Hills which was never accepted by the Nepalese Crown and was manifested in several attacks on Sikkim during which the hills were mostly covered with forests and no significant settlements were observed (*ibid*). During the 30 years starting from 1780, the Gurkhas who had seized power in Nepal and invaded Sikkim “overran Sikkim as far east as the Tista and conquered and annexed the Terai” (Dash, 1947, p. 37). Though the Nepalese conquest of Sikkim ended in 1810, Nepal never accepted Darjeeling to have belonged to Sikkim. Meanwhile, the British East India Company being concerned over Nepal’s growing power and to win over Sikkim as an ally to destroy the Nepalese King went into war with Nepal in 1814 to gain back Darjeeling and hand it over to the Raja of Sikkim (Roy, n. d.). The signing of the Treaty of Sugauli (1816) which ended the Anglo-Gorkha War (1814-1816) was crucial in the

consolidation of Darjeeling (Das, 2014, p. 34). Through this treaty the Nepalese were forced to surrender the land back to the British East India Company who handed it back to the Raja of Sikkim through the Treaty of Titaliya in 1817 (Roy, n. d.). Ten years after the Treaty was signed there arose disputes between Sikkim and Nepal which was referred to the Governor General who appointed two officers in 1828, Captain Lloyd and Mr. Grant to settle the disputes. The two officers were attracted by the numerous advantages of the Darjeeling Hills as a sanitarium and for military purposes and recommended the same to the Governor General who approved of the projects (Dash, 1947, p. 37). Thereafter, General Lloyd carried out negotiations with the Raja of Sikkim and succeeded in executing the “Deed of Grant” through which the Raja handed over the Darjeeling Hills and the Terai to the British East India Company in 1835 (*ibid*). Darjeeling was thus acquired by the British who have since then played an instrumental role in the economy of the Darjeeling Hills. In 1840 Darjeeling was officially recognised as a district (Das, 2014, p.38). At first, the Kalimpong area was notified as a sub-division under the Deputy Commissioner of the district of Western Duars but in 1866 it was transferred to the district of Darjeeling which was the final addition to the district and the district reached its final dimensions (Dash, 1947, p. 41).

Many explanations have been provided regarding the origin of the word Darjeeling. The evolution of the name “Darjeeling” may be traced back to 1763 when a group of monks travelled from the Pemiiongchi Monastery to Darjeeling and built a monastery in 1765 and christened it “Dorrjeeling” (Roy, n.d) after Rinzing Dorji Legden La who was the Chief Abbot of the newly built monastery, and the word “Dorjiling” originally meant “the place where Dorji lives” (Lama, 2008, p. 2). The monastery was however attacked and destroyed by the Nepalese army in 1780 and a makeshift temple dedicated to Lord Mahakal was set up in its place which still stands to date and is a landmark of Darjeeling town. In the meantime, the monks set up another monastery in Bhutia Bustee between 1808 and 1809 and legend has it that people unofficially referred to it as the “replaced Dorrjeeling Monastery” which became popular as a learning centre of Buddhism. Eventually, there occurred a steady influx of monks and Bhutia tribesmen in and around the monastery who along with the populace of the Bustee mingled with the native Lepchas which gradually led to the evolution of a “semi-prosperous economy”. The Bustee began to be known as “Dorrjeeling” since it was where the “Dorrjeeling” monastery was situated. Thus began the evolution of the present day Darjeeling (Roy, n. d.) and the present word Darjeeling may be a mispronunciation of the word “Dorrjeeling”.

Another explanation is that the Observatory Hill being the highest point in the area attracted a lot of thunder and lightning during the monsoons, hence the name Dorjiling, the Land of the Thunderbolt ('Dorji' meaning thunderbolt, the sceptre of Lord Indra and 'ling' meaning house or abode) (Lama, 2008, p. 2). O' Malley (1907) believes that the name Darjeeling is a corruption of the word Dorjeeling (O' Malley, 1907, p. 1). Yet another explanation is that in the "Rong" language of the Lepchas, the original inhabitants of the place, all the hilly regions to the south of the Kanchenzonga mountains inhabited by the Lepchas was known as "Dar-Tzu-Lyang" which meant "the abode of the heavenly goddess of beauty" (Lama, 2008, p.2). Another legend regarding the origin of the name Darjeeling, according to Rai (2008), is that somewhere near the present day Chowrasta or in the Chowkbazar area in Darjeeling town there was a big flat stone where the Khambus (a prominent Gorkha community) used to assemble for chatting. They called that place "Tajeelung" which is made up of the Kirati (another term for Khambus) words "tajee" which means chatting or talking and "lung" means stone. In addition, Rai further mentions that according to the Khambus there was a big flat stone which was used by the Khambus to take rest and exchange their "dowah" (experience of their life) chatting and sitting on that stone or "lung" and called that place "Dowahlung" which later became "Durjeeling" and eventually Darjeeling with the advent of the British (Rai, 2008, p. 70). Rahul Sanskritayan has dismissed the claim that Darjeeling is derived from the word Durjoy-linga though most of scholars accept the view that the name Darjeeling has been derived from Dorje-ling, the name of the monastery on the Observatory Hill which was later shifted to the Bhutia busty (Das, 2014, p.33).

3.3. GEOGRAPHY

Located within the Lesser and Sub-Himalayan belts of the Eastern Himalayas and bounded by the Sikkim Himalaya in the north, the Bhutan Himalaya in the east and the Nepal Himalaya in the west, the hill areas of the Darjeeling district occupy an area of 2,477.83 square kms which constitutes 79 percent of the total area of the district. Rising from 100 metres above sea level in the plains to over 4,000 meters above sea level with the mighty Kanchanjungha in the backdrop, the rugged terrain and the natural beauty of the Hill areas attract tourists from far and near (Desai, 2014, p. 10).

The Darjeeling district is in the shape of an irregular triangle. It however resembles a quadrilateral if the Siliguri sub-division is excluded (Chakraborty, 1986). In the southern region which is the base, lies the Terai, which is a low-lying marshy area having an average

height of 300 ft above sea level; and the apex is formed by the Phalut ridge which is nearly 3,600 meters high and forms the border between Nepal and India (Das and Bhuimali, 2011, p. 27). The hill portion of the district is made up of “a mass of mountainous spurs and ranges” with heights of 12,000 feet with no flat valleys or plains, lakes, precipices, and few or no bare slopes except in areas where the forests have been cleared for tea gardens or cultivation. The main ridges move in all directions and lead to many long spurs on either side which forms valleys varying in climate and elevations. They mostly stretch from north to south, with the principal rivers flowing in the same direction; although many spurs and the torrents between them flow east and west, or north to south in some cases. The interior of the district may therefore be described as “a confused labyrinth of ridges and valleys” (O’ Malley, 1907, p.2). The northern boundary of the district starts on the west at the peak of Phalut nearly 12,000 ft high which forms the boundaries of Nepal, Sikkim and India; and runs east from Phalut along a ridge descending to the Rammam river. The boundary then follows the course of the river, joining the Rangit and following it upto the Tista. East of that, the boundary follows the Tista upstream until it meets the Rangpo-Chu, then moves up the Rangpo-Chu followed by Rishi-Chu to a spur of the Rishi La, the boundaries of Sikkim, Bhutan and India. From here, the boundary with Bhutan follows downwards along the Ni-Chu in a south-easterly direction until it meets the Jaldhaka river from where the boundary follows the course of the river southwards until it reaches the Jalpaiguri district. The district is bounded by Nepal on the west. From Phalut the boundary on the west moves along the southward ridge joining the river Mechi which continues as the boundary right down into the plains and up to the south-west corner of the district. On the south, the district is bounded by the Jalpaiguri district from the Khumani forest on the east to the village of Phansidewa on the Mahanadi river and westward of Phansidewa by the Purnea district of Bihar (Dash, 1947, p.1).

The differences in altitude and aspects lead to significant climatic variations in the district in spite of its size, especially between the hills and the plains. While the hill areas enjoy pleasant summer, heavy rainfall during the monsoons and cold winters with snowfall in higher altitudes, the climate in the plains is characterized by “hot summer, shorter rainy season and mild dry winter” (Chakrabarty, 1986). The intra-district variations in climatic conditions besides being affected by altitude, is also due to the configuration of the neighbouring mountains which deflect winds and significantly affect local rainfall and temperature (Dash, 1947, p.14).

The region receives heavy rainfall throughout the monsoon months, but average rainfall varies considerably from one place to another, as it depends on a number of local

conditions such as the configuration and height of local mountain features (*ibid*). The rainfall in the region fluctuates between a few millimeters in winters to 400-800 millimeters during the summers. Although altitude has no effect on rainfall received, the slope facings of the different areas may affect the rainfall pattern with the southwest, southeast or south facing slopes receiving much higher rainfall than those facing north, northwest or northeast (Desai, 2014, p.33). The heavy downpour makes the district vulnerable to landslides, most of which occur during or soon after the monsoons. In a hilly area like Darjeeling the quantity of rainfall and its pattern needs to be taken into account given that “slope percentage plays an important role in respect of surface runoff, water seepage/infiltration and land use pattern” (Desai, 2014, p. 32).

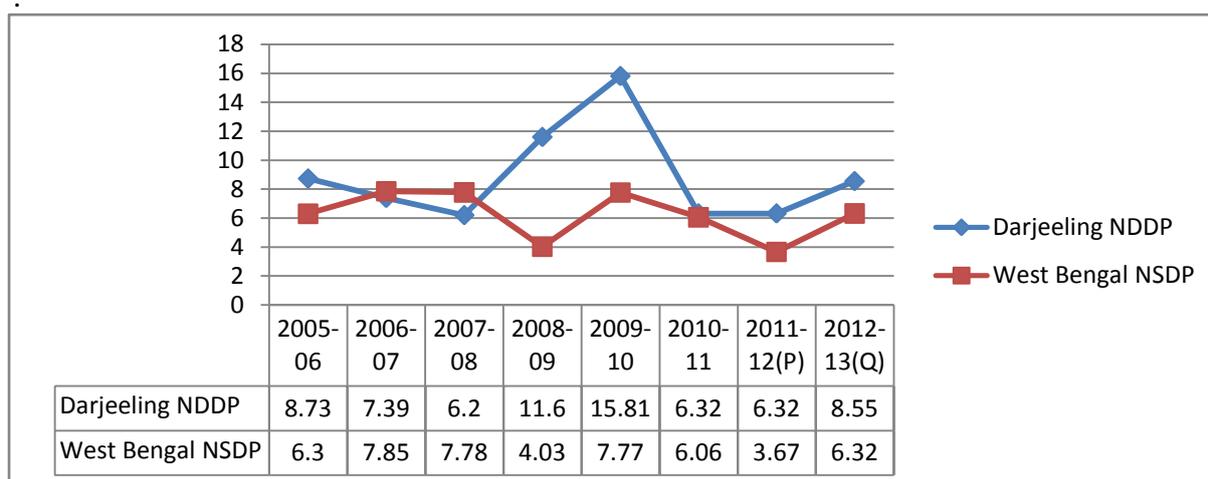
3.4. ECONOMY

3.4.1. District Domestic Product

An important economic indicator of the growth and pattern of economic development of a state or a district is the State Domestic Product (SDP)/ District Domestic Product (DDP) at factor cost with per capita income being used as a measure of the well-being and standard of living of the people (GoWB, 2015). West Bengal is a middle income state and it ranked 5th in respect of Gross State Domestic Product (GSDP) and 18th in respect of per capita income at constant (2004-05) prices for the year 2012-13(Q) among the different Indian states (*ibid*). The hill states of the country have achieved a lower rate of growth in Net State Domestic Product (NSDP) indicating poor economic growth performance, one of the reasons for which could be the disturbed law and order conditions in these regions due to insurgency (Awasthi, 2012, p. 31) which may hold partly true for Darjeeling district, being a witness to several political disturbances over a span of about three decades. Though the hill district of Darjeeling occupied the 14th position in respect of Net District Domestic Product (NDDP) at constant (2004-05) prices for the year 2012-13(Q) among the different districts of West Bengal, it occupied the second position in respect of per capita income at constant (2004-05) prices for the same year, and the top position in respect of the average annual growth of NDDP at constant (2004-05) prices for the period 2005-06 to 2012-13 (GoWB, 2015).

The percentage contribution of the district to the state’s NSDP at constant (2004-05) prices is only a little above 2% though the rates have been increasing, albeit at a slow rate. In 2012-13 the percentage share of the district to the NSDP at constant (2004-05) prices was 2.93 percent. The real value of the NDDP of the district at constant (2004-05) prices rose from Rs. 4,576.98 crores in 2004-05 to Rs. 9,003.08 crores in 2012-13 giving an average

annual growth rate of 8.87 percent. The annual growth rate of the NDDP at constant (2004-05) prices over the period 2005-06 to 2012-13 has been higher than the annual growth rate for the state with the exception of 2006-07 and 2007-08. The rate however picked up in 2008-09 and reached 15.81 percent in 2009-10, the second highest growth rate among the districts, after which the rates again declined in the following year. In 2012-13 however the rate has again increased to 8.55 percent.



Source: GoWB, 2015.

Figure 3.1: Annual Growth Rate of Net District Domestic Product at Constant (2004-05) Prices, Darjeeling District and West Bengal, 2005-06 to 2012-13.

The sectoral composition of NSDP and NDDP (Table 3.1) reveals the declining share of the primary and secondary sectors and the increasing share of the tertiary sector for the state and the district. For the district the share of the primary sector declined from 26.43 to 15 percent and for the secondary sector from 14.14 to 10.65 percent between 2004-05 and 2012-13. The share of the tertiary sector on the contrary has increased from 59.42 to 74.34 percent during the same period. The highest Compound Annual Growth Rate has also occurred in the tertiary sector followed by the secondary and the primary sector during the same period. The per capita incomes of the district as well as the state have shown an increase with the district registering a growth rate of 6.53 percent and the state a growth of 5.17 percent. Clearly, the per capita income of the district is higher than the state average.

The sectoral composition of NDDP shows that there has been services led growth in the district and the state where the service sector has grown at the expense of the primary and the secondary sectors. An increase in per capita income in the district and the high income elasticity of demand for services may have led to a higher growth of the tertiary sector. The

increasing importance and the highest share of the tertiary sector in the district's domestic product however, do not imply a high level of development in the district. The growing importance of transport and communications in the region and the dependence on tourism could have contributed to the rising importance of the tertiary sector. A considerable portion of the output in the tertiary sector may also have been generated in urban informal activities. Economists opine that the services led growth without the development of the secondary sector cannot be sustained for long as the economy will be unable to meet the increased demands for food, clothing and other industrial products as an economy undergoes structural transformation.

Table 3.1: Sectoral Composition of Net State Domestic Product and Net District Domestic Product and Per Capita Income at Constant (2004-05) Prices, West Bengal and Darjeeling, 2004-05 to 2012-13

Year	Primary		Secondary		Tertiary		Per Capita Income (Rs.)	
	Darjee ling	West Bengal	Darjee ling	West Bengal	Darjee ling	West Bengal	Darjee ling	West Bengal
2004-05	26.43	26.22	14.14	18.09	59.42	55.69	26348.4	22648.91
2005-06	24.53	25.16	14.81	17.57	60.65	57.28	28045.42	23808.28
2006-07	23.28	23.76	14.65	17.80	62.08	58.44	29480.42	25399.79
2007-08	21.73	23.16	14.48	17.85	63.79	58.98	30645.82	27094.44
2008-09	19.88	21.63	12.98	16.03	67.14	62.34	33497.57	27913.73
2009-10	17.43	21.31	13.00	16.44	69.57	62.25	37972.06	29799.05
2010-11	16.38	19.57	12.80	16.80	70.82	63.63	39513.04	31314.18
2011-12	15.15	18.82	10.98	15.03	73.87	66.15	41121.03	32164.00
2012-13	15.00	18.25	10.65	14.41	74.34	67.35	43695.79	33889.16
CAGR	1.39	1.50	5.04	3.23	11.92	8.76	6.53	5.17

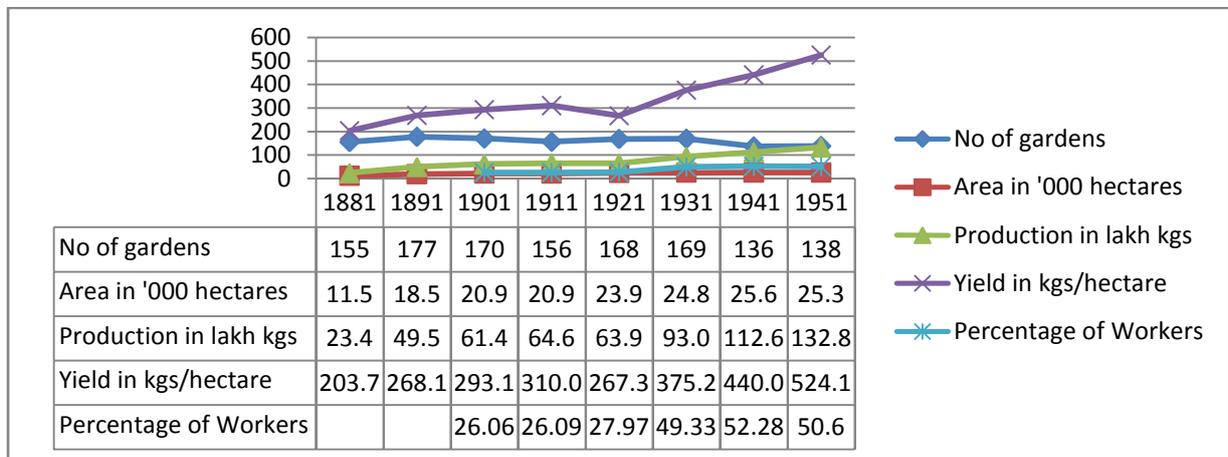
Source: GoWB, 2015. Note: CAGR-Compound Annual Growth Rate

3.4.2. Tea

The economy of the Darjeeling hills is primarily dependent on tea, tourism and agriculture. The tea industry is the backbone of the hill economy with the Darjeeling Hills having the highest concentration of tea industries in the Eastern Himalayas and absorbing the largest number of workers in the region (Chhetry, 1999, p.36). The growth of the tea industry has also been the most powerful factor contributing to the growth of population in the district (Das and Bhumali, 2011, p. 67).

The credit for the establishment of the tea industry in Darjeeling goes to Dr. Campbell, the then Superintendent of Darjeeling, who in 1840 started the experimental growth of tea in Darjeeling. However, it was not until 1856 that the industry was established

as a commercial enterprise, and the Alubari tea garden was opened by the Kurseong and Darjeeling Tea Company, and another garden in Lebong was set up by the Darjeeling Land Mortgage Bank. About the same time the planters started focusing their attention to the Tarai and in 1862 the first garden was opened out at Champpta near Khaprail. Meanwhile, the development of the tea industry in the hills gathered momentum as the soil and climate were found to be suitable to the growth of tea and by 1866 there were about 39 gardens with 10,000 acres under cultivation, having an outturn of over 4,33,000 lbs. of tea. During the next 30 years, the number of gardens in the district more than quadrupled and the outturn increased by a massive amount (O' Malley, 1907, pp.72-74). The Figure 3.2 shows the tea statistics in the district for the period 1881-1951.



Source: Das and Bhuijali, 2011, p. 68.

Figure 3.2: Tea Statistics, Darjeeling District, 1881-1951

After Independence most of the tea gardens were sold to Indian companies. However, due to lack of prior experience and absence of long term policy of the Government of India with respect to management in tea plantations, the new management who took over the reins from their British counterparts carried on the old business in a stereotyped manner with no motivation for introducing technological changes. The position of the tea companies particularly in Darjeeling therefore continued to deteriorate (Das, 2014, p. 120). Since 1961 there has been a fall in production and acreage and the number of labourers employed.

Over the years amalgamation of several estates has led to decline in the number of gardens. Further closure of several gardens has also contributed to this decline. Between 1991 and 2001 the number of tea gardens has declined from 132 to 86. Unofficial records however show the number of gardens in 2001 as only 65 which show the closure of 50 percent of the

tea gardens which is alarming. In 2011-12 there were 87 tea gardens in the district occupying an area of 18,091.96 hectares and providing employment to 51,485 people (GoWB, 2014).

The tea industry in recent years has been facing several challenges. The productivity in the Darjeeling Hills is very low compared to the all India average. The hilly terrain along with the lack of proper infrastructure, the high costs of labour in addition to low productivity have led to increase in the production costs. The effects of climate change in the form of erratic rainfall pattern causing frequent landslides along with other environmental hazards have also contributed to significant losses for the gardens along with deterioration in the quality of tea. Moreover, hardly any extra land is available for expansion or establishment of new estates. The dwindling condition of the tea gardens in the region and their subsequent closure has caused starvation deaths in several families.

3.4.3. Agriculture in Darjeeling

The agricultural activities practiced in the hill and mountain regions are significantly different from the mainstream agriculture practiced in the lowland areas and is termed as mountain farming. “Mountain farming is broadly defined as all land based activities, such as cropping, horticulture, animal husbandry, forestry, and their interlinkages, and is the prime source of sustenance of the mountain populations. Farming is also the prime user of the natural resource base and production environment in the mountain areas” (Partap, 1995). The hill and mountain regions, particularly the lower and middle mountains where annual cropping is one of the land-based activities may be regarded as one of the fragile or marginal resource areas which is defined as “one which cannot tolerate the degree of disturbance implied by the intensity of use associated with specific usage” (Jodha, 1991). In fragile areas sustainable agricultural practices are hindered due to the specific features of these regions which are related to the physiographic constraints.

Prior to the advent of the “skilful Nepalese cultivators” the system of cultivation that was practiced in the interior of the hills by the nomadic tribes i.e. the Bhutias and Lepchas, and by the Meches and the other aboriginal tribes on the foothills, was *jhumming* or shifting cultivation. *Jhumming* consisted of clearing the forest by burning the forest cover for growing crops using the hoe. However in a year or two the soil would soon become exhausted and the tribes would move on to a fresh patch and follow the same procedure. The Nepalese immigrants brought along with them the “superior method” of terrace cultivation which includes constructing terraces on the mountain slopes for growing crops by using the plough and is a distinctive and important feature of Himalayan cultivation. Cultivation thus expanded rapidly in the middle of the 19th century. Due to the reservation of forests, appropriation of

land for tea cultivation and extension of plough cultivation with the advent of the Nepalese the wasteful system of *jhumming* gradually disappeared (O'Malley, 1907, p. 64; Dash, 1947, pp. 102-103).

Though the system of land management/village administration remained significantly the same in the district, the nature of economy changed during the British period (Subba, 1985, p.37). The hills east of the River Teesta which includes the Kalimpong sub-division was made an agricultural area, while the hills to the west which comprises of Sadar and Kurseong sub-division was covered with tea gardens, the area under ordinary non-plantation crops being very small and confined to an area north-west of the Little Rangit river known as Chebu Lama's grant (*ibid*; Dash, 1947, pp. 99-100). The clear demarcation in the economy of the district may be due to the following reasons: late annexation of Kalimpong sub-division, nature of the land itself which is not very steep in Kalimpong as compared to Darjeeling and the climatic conditions which are more suitable to cultivation in Kalimpong as compared to the land in the west of River Teesta (Subba, 1985, p. 37).

The agriculture practiced in the Darjeeling Hills is different in nature from agriculture in the rest of the country in that the agriculture in the hills is primarily traditional and is characterised by small scale of operations and high labour intensity with the agricultural goods market being highly unregulated (Chetry, 1999, p. 59). The physical configuration of the district makes the conditions for agriculture extremely diverse. In the lowland areas there are stretches of alluvial soil suitable for rice cultivation. However in the hills many of the slopes are stony and precipitous and unsuitable for cultivation, although on the gentler slopes the soil is very fertile (Dash, 1947, p. 99). Due to the physical constraints therefore, the agricultural pattern of the hills is not the same as in the plains (Dasgupta, 1990, p. 62). In the hills only 13% of the total land is available for cultivation (*ibid*). The incline of the slopes, aspect of land and elevation have important influence on the fertility of land, hence nature of cultivation. Cultivation of land on steep slopes and felling of trees may give way to landslips. On less steep slopes the plough can be used and if the land is precipitous then the hoe can be used. Aspect of the land also has an influence on the fertility. An eastern or southern aspect is best since they get the benefit of the morning and midday sun whereas a northern aspect is cold and sunless (O'Malley, 1907, p. 64-65). However, even parts of the east and west facing slopes at times get little sunshine especially when the lands are eclipsed by hilltops or when they are in deep valleys (Subba, 1985, p. 104). Altitude or elevation of the land also has an immense influence on the fertility of land hence nature of cultivation.

3.4.3.1. Cropping Pattern

The farming system prevalent in the hill region of the district can be classified as a mixed crop system, primarily dominated by food crops. Before the advent of the British there was very little cultivation, so it may be said that all the crops, fruits and vegetables grown in the district are not native but have been introduced and acclimatised (Dash, 1947, p.107). The agricultural crops in the region can be broadly grouped into two categories-food crops and cash crops. The food crops include rice in wet cultivation, and maize, millets, buck-wheat in dry cultivation (also known as sukshakhet) and potato, barley etc. while the cash crops include tea, cinchona, ginger, cardamom, potatoes, fruits and vegetables (Dash, 1947, p. 103; Desai, 2014, p.83). Agriculture is greatly influenced by altitude and slope aspect and the methods of cultivation in the hills vary with the crops to be grown. No crops are grown above 2,895 meters due to the cold. Tea plantations are found between 762-1,981 meters, as also paddy. The vegetables are cultivated in the lower slopes and fruits such as orange, papaya, peaches, guava, plums, mangoes etc. are grown in the valleys and areas with low altitudes. Wheat, buck-wheat, barley, millets etc. are found to be cultivated above 1,372 meters. Cash crops like cardamom and ginger on the other hand are mainly cultivated in places where water supply is plenty such as the lower slopes and along the *jhoras* (Desai, 2014, pp. 83, 116). The principal vegetables grown in the region are peas, beans, potatoes, cauliflowers, beetroots, carrots, radishes, tomatoes, squash, *rayo saag* etc. which can be marketed far and near. It is possible to grow many of these vegetables over different altitude ranges (Chetry, 1999, p. 61). Table 3.2 shows the tentative cropping pattern of the Darjeeling Hills according to the altitude of the land. Though the cropping pattern depends on other factors such as aspect and nature of the land as well, it is clear from Table 3.2 that paddy, maize, millets and vegetables etc. cannot be grown at high altitudes.

Table 3.2: Cropping Pattern in Darjeeling Hills

Altitude	Kharif	Rabi
Below 1,000 meter	Maize/ Paddy/Millet/Vegetables	Wheat/ Barley/Potatoes
Between 1,000 and 1,500 meter	Maize/ Paddy/Millet/Vegetables	Wheat/ Barley/Potatoes
Between 1,500 and 2,000 meter	Maize/ Potatoes/Vegetables	Wheat/ Barley/Potatoes
Above 2,000 meter	Monocrop of Potatoes/ Barley/Vegetables	

Source: Dasgupta, 1990, p. 62.

3.4.3.2. Production of Major Crops

The district has lower productivity levels as compared to the other districts for almost all crops. The productivity of the district for almost all major crops is also lower than the state average. The percentage share of the district in the total production of the major crops is also miniscule with the exception of maize (Table 3.3).

Table 3.3: Percentage Share of Darjeeling District in Total Production of Major Crops in West Bengal, 2010-11 to 2012-13

Crops	Rice	Wheat	Maize	Pulses	Oilseeds	Fibre Crops	Sugarcane
2010-11	0.58	0.40	46.84	0.18	0.04	0.37	0.03
2011-12	0.49	0.48	46.62	0.19	0.03	0.39	0.06
2012-13	0.45	0.26	37.37	0.20	0.04	0.44	0.05

Source: Computed by Author from GoWB, 2009b, 2014 (District Statistical Handbook Darjeeling 2007, 2012)

As regards production of maize, the district ranked the highest contributing 37 % of the total production of maize in the state in 2012-13. The percentage share of the district in the total production has however declined, albeit marginally for rice, sugarcane and wheat; and by almost half for maize between 2011-12 and 2012-13. For pulses, oilseeds and fibre crops the percentage shares have increased slightly.

The area under the principal crops, total production and productivity of major crops in the Darjeeling district as well as for the hill and plain regions of the district can be understood with the help of Table 3.4. With the exception of potatoes and maize the area under different crops in the plains is greater than in the hill region. In 2006-07 productivity of wheat and pulses was slightly higher in the hills as compared to the plains. However, in 2011-12 the productivity of all the major crops in the hills was lower than that in the plains. The low productivity in the hill regions could be attributed to the prevalence of small and marginal holdings which may further be fragmented and scattered; low soil fertility; poor irrigation facilities and inability to use modern technology and inputs (Mamgain, 2004, p.47).

Boro paddy is not cultivated in the hills while aus paddy contributed a very small percentage (0.20 percent) to the district's total production in 2011-12. Aman paddy forms almost 20 percent of the total production of the district. Wheat production in the hills constitutes around 10 percent of the district's production. The highest contribution is of maize which formed almost 97 percent of the district's production. Pulses, oilseeds and potatoes constituted 39, 31 and 53 percent respectively to the district's total production in 2011-12. The production of most of the crops has shown an increase in the hills during the five year

period with the exception of pulses and potatoes which have shown a slight decline. For the district aus paddy and pulses have shown a slight decline.

Table 3.4: Area, Production and Productivity of Major Crops in Hill and Plain Regions of Darjeeling District, 2011-12

Year		2006-07			2011-12			Production as % of District 2011-12
Crop	Region	Area in hect.	Production in '000 metric tonnes	Productivity in kg/hect	Area in hect.	Production in '000 metric tonnes	Productivity in kg/hect	
Aus	Hill	-	-	-	7	0.01	1857	0.20
	Plain	4356	8.9	2040	3461	6.4	1863	99.8
	Total	4356	8.9	2040	3468	6.5	1863	-
Aman	Hill	5392	9.6	1773	5596	11.9	2134	19.7
	Plain	20144	37.0	1838	21646	48.6	2247	80.3
	Total	25536	46.6	1824	27242	60.6	2224	-
Boro	Hill	-	-	-	-	-	-	-
	Plain	1536	3.2	2071	1579	4.3	2723	100
	Total	1536	3.2	2071	1579	4.3	2723	-
Wheat	Hill	228	0.35	1526	201	0.40	1965	9.5
	Plain	1988	2.8	1418	1792	3.8	2097	90.5
	Total	2216	3.2	1429	1993	4.2	2083	-
Maize	Hill	NA	NA	NA	15226	35.0	2301	97.3
	Plain	NA	NA	NA	428	0.99	2313	2.7
	Total	14600	30.8	2110	15654	36.0	2301	-
Jute*	Hill	-	-	-	-	-	-	-
	Plain	2481	31.4	13	3039	33.7	11	100
	Total	2481	31.4	13	3039	33.7	11	-
Pulses	Hill	98	0.07	694	97	0.05	505	39.2
	Plain	196	0.11	536	138	0.08	551	60.8
	Total	294	0.17	588	235	0.13	532	-
Oilseeds	Hill	55	0.03	491	133	0.05	391	32.6
	Plain	216	0.11	491	275	0.12	425	67.4
	Total	271	0.13	491	408	0.17	414	-
Potato	Hill	2684	46.9	17479	3239	46.2	14254	53.3
	Plain	1632	33.3	20411	1735	40.5	23330	46.7
	Total	4316	80.2	18588	4974	86.6	17420	-
Sugar cane	Hill	NA	NA	NA	-	-	-	-
	Plain	NA	NA	NA	8	0.93	116375	100
	Total	NA	NA	NA	8	0.93	116375	-

Source: Computed by Author from GoWB, 2009b, 2014 (District Statistical Handbook Darjeeling 2007, 2012)

Note: NA-Not Available. Pulses include masur, maskalai and khesari, Oilseeds include mustard and til. *

Production in thousand bales of 180 kg each and Productivity in bales per hectare.

3.4.3.3. Production of Fruits and Vegetables

West Bengal is primarily a rice producing state. However, in recent years diversification in cropping pattern towards high value cash crops is taking place which would help to increase the contribution of non-rice crops to output ratio for achieving higher agricultural growth rates in the future besides contributing towards higher levels of nutrition, poverty reduction, employment generation and sustainable natural resources management (Bhattacharya, 2008). The state is a leading producer of a wide variety of horticultural products which includes traditional and non-traditional vegetables, fruits and high value exotic flowers.

Historically, the Darjeeling hills have pioneered the development of floriculture in India, with the nurseries at Kalimpong in the Darjeeling district being among the first to export floriculture products from India to the USA, UK and other European countries (Chattopadhyay and Roy, 2011). The state including the hill areas of Darjeeling district also has immense potential in the cultivation of medicinal plants and herbs.

Table 3.5: Area and Production of Fruits and Vegetables, Darjeeling district and West Bengal, 2001-02 to 2010-11.

Year	Darjeeling				West Bengal				As % of State			
	Fruits		Vegetables		Fruits		Vegetables		Fruits		Vegetables	
	Area	Prod	Area	Prod	Area	Prod	Area	Prod	Area	Prod	Area	Prod
01-02	10.3	0.171	20.5	0.198	147.6	1.986	838.8	10.25	7.0	8.6	2.4	1.9
02-03	10.5	0.174	20.8	0.204	152.2	1.786	874.9	10.64	6.9	9.7	2.4	1.9
03-04	10.6	0.172	21.6	0.214	160.9	2.016	859.8	10.92	6.6	8.5	2.5	2.0
04-05	10.9	0.177	21.9	0.225	166.3	2.128	868.4	11.06	6.5	8.3	2.5	2.0
05-06	11.1	0.187	22.4	0.241	172.7	2.302	889.8	11.56	6.4	8.1	2.5	2.1
06-07	8.7	0.176	21.6	0.238	187.1	2.641	903.6	12.09	4.7	6.7	2.4	2.0
07-08	11.1	0.208	21.7	0.235	194.3	2.767	912.4	12.56	5.7	7.5	2.4	1.9
08-09	11.2	0.209	21.7	0.235	203.3	2.776	922.8	12.80	5.5	7.5	2.3	1.8
09-10	11.2	0.209	21.8	0.234	208.3	2.861	932.7	13.03	5.4	7.3	2.3	1.8
10-11	11.4	0.214	22.7	0.240	211.6	2.953	943.3	13.33	5.4	7.3	2.4	1.8

Source: GoWB, 2005, 2009b, 2014(District Statistical Handbook Darjeeling 2004, 2007 and 2012). GoWB, 2006, 2009a (Statistical Abstract West Bengal, 2005 and 2008) and Economic Review West Bengal 2011-12).
Note: Area in thousand hectares and production in million tonnes.

The Table 3.5 shows the total area under, and the production of fruits and vegetables in the district and the state. The percentage contribution of the district in terms of total area and production for fruit cultivation has shown a decline from 2001-02 up to 2006-07 thereafter which it has increased and remained almost steady up to 2010-11. For vegetables however,

the percentage share of the district in total area has remained more or less steady for the decade and so has the percentage share of the district in total production of the state. The productivity of different fruits and vegetables in the district has not shown much change but is higher as compared to the productivity of other principal crops.

The area, production and yield of different fruits and vegetables in the district for the period 2008-09 and 2011-12 are shown in Table 3.6.

Table 3.6: Area, Production and Yield of Different Fruits and Vegetables, Darjeeling District, 2008-09 to 2011-12

Fruits and Vegetables	08-09			09-10			10-11			11-12		
	Area	Prod	Yield									
Mango	0.1	0.2	2833.3	0.1	0.2	2833.3	0.1	0.2	3166.7	0.1	0.2	3500
Banana	0.3	3.9	15760	0.3	3.9	15760	0.3	3.9	15760	0.4	5.5	15828.6
Pineapple	4	126.9	31964.7	4	126.9	31725	4.2	131.9	31783.1	4.2	133.9	31654.8
Papaya	0.1	3	33222.2	0.1	3	33222.2	0.1	3	30100	0.1	2.9	32222.2
Guava	0.1	1.5	16111.1	0.1	1.5	16111.1	0.1	1.5	16111.1	0.1	1.7	13750
Jackfruit	0.2	2.6	15117.6	0.2	2.6	15117.6	0.2	2.6	15117.6	0.2	2.6	15117.6
Litchi	0.1	0.6	9166.7	0.1	0.6	9166.7	0.1	0.6	9166.7	0.1	0.6	9166.7
Mandarin Orange	3.7	36	9777.2	3.7	36.2	9818.4	3.7	36.5	9873	3.8	37.6	9936.5
Other Citrus fruits	0.1	1.2	8857.1	0.1	1.2	8857.1	0.1	1.2	8857.1	0.1	1.3	8928.6
Others	2.7	32.8	12312	2.6	32.7	12369.6	2.6	32.8	12381	2.7	32.8	12373.6
Tomato	1	13.5	13915.3	1	14.5	14948.3	1	14.7	14959.2	1	14.7	14808.1
Cabbage	1	30.1	30292	1	30.1	30292	1	30.5	30198	1	31.1	30194.2
Cauliflower	0.9	26.6	29092.9	0.9	26.6	29092.9	0.9	27	29000	0.9	27	29000
Peas	2.6	12.2	4674.8	2.6	12.2	4674.8	2.7	12.6	4733.1	2.7	12.1	4545.1
Brinjal	1.2	24.6	20642.9	1.2	24.6	20647.1	1	20.6	21500	1.2	26.2	21677.7
Onion	0.1	0.5	8846.2	0.1	0.5	8846.2	0.1	0.5	9600	0.1	0.4	8000
Cucurbits	5.2	80.6	15630.3	5.3	78.6	14952.4	5.3	81.4	15266.4	5.3	81.4	15499
Ladies Finger	0.5	6.1	12004	0.5	6.1	12004	0.5	6.2	12215.7	0.5	6.1	12019.6
Radish	1.1	13.9	12428.6	1.1	13.9	12428.6	0.8	9.7	12802.6	1.1	14.4	12945.9
Others	8.2	26.7	3271.2	8.2	26.7	3270.4	9.5	36.8	3865.5	8.3	27.9	3367.9

Source: GoWB, 2014 (District Statistical Handbook Darjeeling 2012)

Note: Area in thousand hectares. Production in thousand tonnes. Yield in kgs per hectare.

3.4.3.4. Land Use Pattern

In order to understand the relationship between man and the environment it is important to study land use pattern. In view of rapidly increasing population pressure and decreasing man land ratio, the study of land use becomes increasingly crucial so as to achieve optimum utilization of land and prevent its exploitation and degradation. Land use classification may

be defined as “the systematic arrangement of various classes of land on the basis of certain similar characteristics, mainly to identify and understand their fundamental utilities in satisfying the needs of human society” (Das, 1990, p.141). Among the different uses of land, the most important is agricultural use of land since it is essential for survival.

When the British first took over the area from Sikkim in 1835, the region was entirely covered with forest with little habitation. With growth in population the forests were converted into cultivated land and tea gardens (Dash, 1947, p.123). In fact, the main problem in the Darjeeling hills is population explosion since deforestation has taken place to a large extent to cater to the large volume of population, which results in maximum soil erosion in the hills (Desai, 2014, p. 100). In 1901 more than 50 percent of the geographical area was under forests whereas in 2011-12 only 38 percent of the total reporting area was under forests. Between 1901 and 1931 Darjeeling’s forest area diminished by 6.08 percent, between 1931 and 1961 by 0.61 percent and by 11.95 percent between 1961 and 1991 (Das and Bhumali, 2011, pp. 148-149). During 2002-03 and 2011-12 the forest area has remained constant. The percentage of arable land on the other hand has increased continuously between 1901 and 1991. While only 20 percent of the total geographical area was arable in 1901, the percentage increased to 56 in 1991; with an increase of 0.62 percent between 1901 and 1931, 11.54 percent between 1931 and 1961, and 24.49 percent between 1961 and 1991 (*ibid*).

Table 3.7: Classification of Land Utilisation Statistics, Darjeeling District, 2007-08 to 2011-12 in thousand hectares

Year	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
2007-08	325.47	124.57	37.22	2.38	0.83	2.00	1.80	3.82	12.15	140.70
2008-09	325.47	124.57	39.88	2.48	0.87	2.21	1.67	3.75	17.53	132.51
2009-10	325.47	124.57	40.16	2.14	1.13	2.33	1.55	3.65	17.67	132.27
2010-11	325.47	124.57	40.53	2.46	0.83	2.35	1.49	3.22	16.44	133.58
2011-12	325.47	124.57	38.62	2.57	0.57	2.64	1.31	3.18	17.36	134.65

Source: GoWB, 2014 (District Statistical Handbook, Darjeeling, 2012) (1) Reporting Area (2) Forest Area (3) Area under Non-agricultural use(4) Barren & unculturable land (5) Permanent pastures & other grazing land(6) Land under Misc. tree groves not included in Net area sown (7) Culturable waste land (8) Fallow land other than Current fallow (9) Current fallow (10) Net area sown.

In the Darjeeling Hills the problems related to the land use is the high density of population. Since the scope for extension of agricultural land is limited, there is increasing pressure on

forested and other restricted land to cope up with the increasing demand for food. Another problem is that the carrying capacity of the roads has never been examined with respect to geology etc. The increase in vehicular traffic in recent years due to expansion of trade and commerce along with heavy rainfall has contributed to the frequent landslides especially along the roadsides (www.darjeeling.gov.in). The classification of land utilization is shown in Table 3.7.

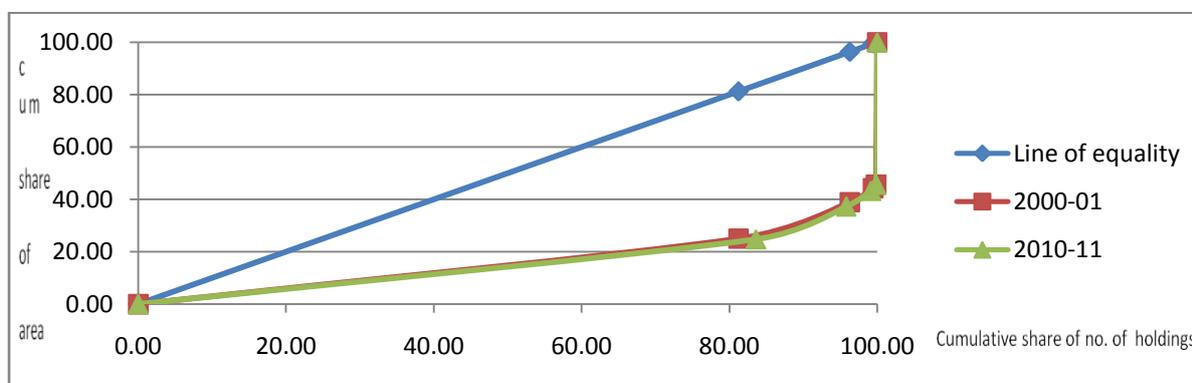
3.4.3.5. Economic Structure of Land Holdings

The distribution and structure of operational holdings (Table 3.8) in the district clearly reveals inequality in the distribution of holdings. Table 3.8 shows that more than 95 per cent of the total holdings are under small and marginal farmers who own 37 percent of the total operated area. The percentages have not shown much variation over the decade.

Table 3.8: Distribution of Operational Holdings over Size-class, Darjeeling, 2000-01 to 2010-11

Size-Class in hectare	Number			Area		
	2000-01	2005-06	2010-11	2000-01	2005-06	2010-11
Marginal	81.22	83.21	83.59	25.33	25.01	24.77
Small	15.08	12.58	12.22	13.57	12.77	12.52
Semi-medium	3.15	3.67	3.37	5.35	6.28	5.97
Medium	0.38	0.40	0.67	1.38	1.48	2.38
Large	0.17	0.15	0.14	54.36	54.46	54.36
Total	100	100	100	100	100	100
Total Number	92001	103697	104358	152376	151957	151303
Average size of holdings in hectares				1.66	1.47	1.45

Source: GoWB, 2009b, 2014 (District Statistical Handbook Darjeeling, 2007, 2012). Note: Marginal-Below 1.0 hectare, Small-1.0 hectare and above but less than 2.0 hectares, Semi-medium-2.0 hectares and above but less than 4.0 hectares, Medium-4.0 hectares and above but less than 10.0 hectares, Large-10.0 hectares and above. It includes mostly institutional holdings



Source: Computed by author from GoWB, 2009b, 2014 (District Statistical Handbook Darjeeling, 2007, 2012).

Figure 3.3: Land Holding Structure, Darjeeling District, 2000-01 and 2010-11

The Lorenz curve for number and area of land holdings for the years 2000-01 and 2010-11 is shown in the Figure 3.3 which exhibits the predominance of small and marginal peasantry where a small proportion of total peasants are controlling a significant share of total area.

3.5. DEMOGRAPHY

The status of women of any region can be better understood by an analysis of the demographic attributes of that region viz. fertility, mortality, marriage, migration and social mobility, as these attributes “shape the size and composition of human population” and have a strong influence on the quality of life and the social position of women (Banerjee and Mukherjee, 2005, p. 21). Banerjee and Mukherjee, further mention that there is a two-way relation between women’s experiences of empowerment (or disempowerment) and the demographic characteristics with each influencing the other (*ibid*).

3.5.1. Growth of Population

The growth of Darjeeling district is a remarkable example of population expansion that has ever been recorded in Bengal (O’ Malley, 1907, p.35). When it was first acquired by the East India Company in 1835 from the Raja of Sikkim it was mostly covered by forest and the population comprised of only “100 souls” on an area of 138 square miles (*ibid*). The low population may have been due to the heavy forest, poor communications and “a primitive system of government which countenanced slavery” and did not promote development (Dash, 1947, p.49). The onus of altering the present state of affairs rested with Dr. Campbell, the first Superintendent whose main objective was to encourage the settlement of the neighbouring tribes and to promote Darjeeling as the commercial centre of the hills. Dr. Campbell was successful in his endeavours and by 1850 he reported that the number of inhabitants had risen to 10,000 (O’ Malley, 1907, p.35). Prior to 1872, enumeration of the population of the entire district had not been carried out. A rough census of Darjeeling Municipality undertaken in 1869 gave a total population of 22,607 persons with the number of males being 14,766 and females 7,841 (Hunter, 1876, p.24).

Prior to 1860 there were some annexations and addition of territory to the Darjeeling hill tract along with the Terai. The exact population of the Terai was not known but the 1872 Census showed the total population of the Terai to be 47,985 (Dash, 1947, p. 49). After the Bhutan War of 1865, the Kalimpong sub-division was also annexed, whose population was estimated to be 3,536. In 1881 its population stood at 12,683 which show considerable immigration since annexation (*ibid*).

The first regular Census of the district after the annexations was complete and the district thus constituted was carried out in 1871-72 (*ibid*). The total population stood at 94,712 with the number of males being 53,057 and females 41,655 respectively dwelling in 18,864 houses with the average density of population being 77 per square mile (Hunter, 1876, p. 25). The total population and the decadal growth in population in the district and the state of West Bengal are shown in the Table 3.9.

Table 3.9: Population and Decadal Variation in Population, Darjeeling and West Bengal, 1872-2011

Year	Population		Decadal Variation (Absolute)		Decadal Variation (Percentage)	
	Darjeeling	West Bengal	Darjeeling	West Bengal	Darjeeling	West Bengal
1901	2,65,780	169,40,088	-	-	-	-
1911	2,79,899	179,98,769	14,119	10,58,681	5.3	6.3
1921	2,94,237	174,74,348	14,338	-5,24,421	2.1	-2.9
1931	3,32,061	188,97,036	37,824	14,22,688	12.9	8.1
1941	3,90,899	232,29,552	58,838	43,32,516	17.7	22.9
1951	4,59,617	262,99,980	68,718	30,70,428	17.6	13.2
1961	6,24,640	349,26,279	1,65,023	86,26,299	35.9	32.8
1971	7,81,777	443,12,011	1,57,137	93,85,732	25.1	26.9
1981	10,24,269	545,80,647	2,42,492	102,68,636	31	23.2
1991	12,99,919	680,77,965	2,75,650	134,97,318	26.9	24.7
2001	16,09,172	801,76,197	3,09,253	120,98,232	23.8	17.8
2011	18,46,823	912,76,115	2,37,651	110,99,918	14.8	13.8

Source: Census of India website-www.censusindia.gov.in A-2 Decadal Variation in Population since 1901

The population of the District increased manifold during 1872-1881. This large increase has been attributed partially to “the incompleteness and inaccuracy of the first census” and mostly to the development of the tea industry and the opening of new tea estates; the influx of settlers to cultivate the wastelands of the district; improvements in communications due to building of roads and railways which facilitated development and encouraged educational activity. The importance of the tea industry on the growth of the population of the district may be judged from the fact that in 1872 there were only 74 tea gardens with an area of 14,000 acres. This number increased to 153 tea gardens with total acreage being 30,000 in 1881. The local labour being insufficient to meet the demands of the highly labour intensive tea industry, large scale immigration from the neighbouring areas of Nepal ensued which caused the population to increase by large numbers. The development of the tea industry also led to increase in the number of Europeans as supervising staff. The influx of agriculturists is

apparent from the expansion of population of Kalimpong which had a population of 3,530 in 1865 when it was annexed from Bhutan which increased to 12,683 in 1881 and to 26,631 in 1891 which can be attributed entirely to the immigration of agriculturists (O'Malley, 1907, pp. 35-37; Dash, 1947, p. 50). After 1891 the tea industry experienced depression which may be responsible for the decline in the growth of population. Immigration may also have steadied (Dash, 1947, p. 50).

After 1941 the population shows a sharp increase. This may be attributed to the fact that since the figures after 1951 were drawn from the Census of India, it included the population of a part of Phansidewa area which belonged to Bihar and also to West Dinajpur until 1959 (Subba, 1985, p.10). The growth rate of population has however been declining since the 1980s. Another trend worth mentioning is that the growth rate of population of the district is higher than that of the State. Subba mentions three important factors among others which have led to greater increase in urban population of the district as compared to that of the state which may be the reason for the higher growth rate of total population in the district- the large influx of Tibetans after the Chinese annexation of Tibet, in migration of the non-Nepalese communities like Marwaris, Biharis, etc. and the out migration of the members of rural agricultural households to urban areas in search of jobs, education etc. (*ibid*, p.11). An important feature of the population growth in the district especially up to 1901 is that the growth has been exogenous and not endogenous (Dasgupta, 1990, p. 10), and is a remarkable example of population growth caused due to in migration (Das & Bhuimali, 2011, p. 38).

The Darjeeling district comprises of three sub-divisions which lie in the hill areas- Darjeeling Sadar, Kalimpong and Kurseong, and Siliguri sub-division which lies in the plains. The Darjeeling Hills occupy an area of 2,477.83 square kms and had a population density of 353 persons per square kilometer according to 2011 Census. The Table 3.10 shows the population of the district and the population of the hill region as a percentage of the district.

The three hill sub-divisions together accounted for more than half (almost 53 percent) of the population of the district in 1991 which declined to 49 and 47 percent respectively in 2001 and 2011. The decline in the proportion of the hill population may be an indication of migration of the hill population to the lowland areas or an in migration from the surrounding states or countries to the Siliguri sub-division of the district. Almost 58 percent of the district's rural population resided in the hills in 1991 which has gradually declined to 53 and 52 percent respectively in 2001 and 2011. Since more than 50 percent of the district's rural population resides in the hill areas the hill economy is primarily rural. As regards the urban

population, the hills comprised about 41 percent of the district's urban population in 1991 which increased slightly to 41.24 percent in 2001 but again declined to 40 percent in 2011. The proportion of the district's female population residing in the hills is greater than the proportion of the male population in both rural and urban areas which may again be an indication of male outmigration from the hill areas.

Table 3.10: Population of Darjeeling Hills as a Percent of District, 1991-2011

Year	1991			2001			2011		
	Person	Male	Female	Person	Male	Female	Person	Male	Female
Total									
Darjeeling District	1299919	679323	620596	1609172	830644	778528	1846823	937259	909564
Darjeeling Hills	684818	351881	332937	790591	401520	389071	875703	440257	435446
As Percent of District	52.68	51.8	53.65	49.13	48.34	49.98	47.42	46.97	47.87
Rural									
Darjeeling District	903859	467324	436535	1088740	556633	532107	1118860	566965	551895
Darjeeling Hills	522475	267871	254604	575940	290521	285419	583639	294454	289185
As Percent of District	57.8	57.32	58.32	52.9	52.19	53.64	52.16	51.94	52.4
Urban									
Darjeeling District	396060	211999	184061	520432	274011	246421	727963	370294	357669
Darjeeling Hills	162343	84010	78333	214651	110999	103652	292064	145803	146261
As Percent of District	40.99	39.63	42.56	41.24	40.51	42.06	40.12	39.37	40.89

Source: Census of India, 1991-2011 (Census of India website-www.censusindia.gov.in)

3.5.2. Population Density

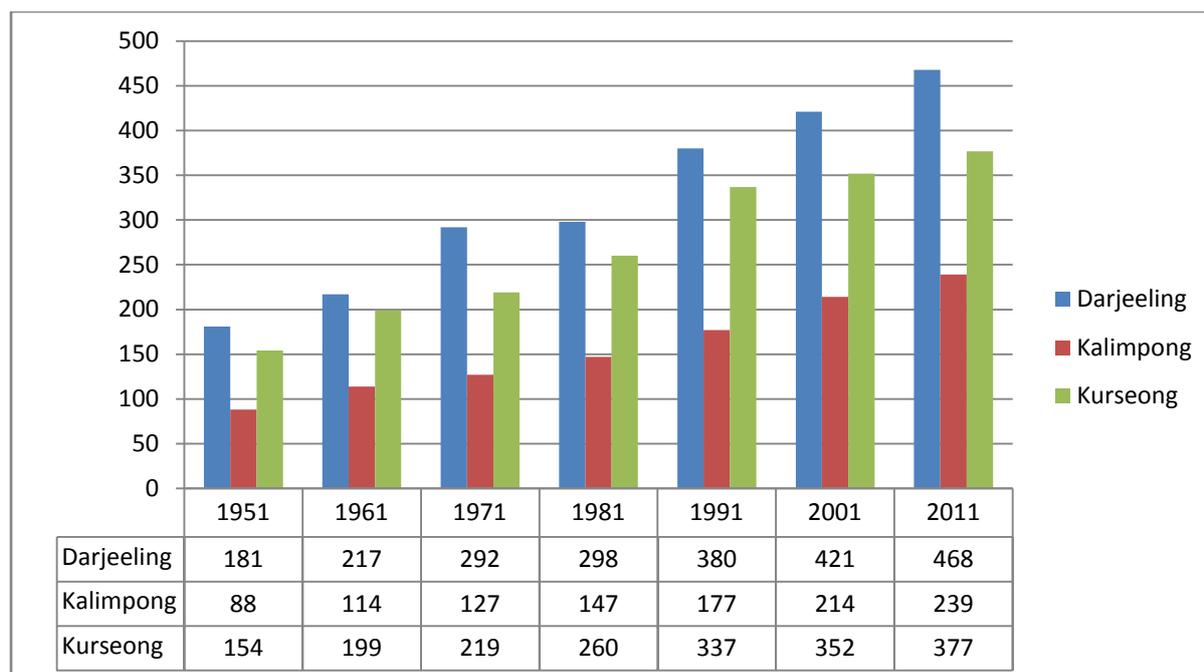
O' Malley (1907) mentions that in the first regular census of the Darjeeling district undertaken in 1871-72 the average density of population was 81 per square miles. He further mentions that the district as a whole, was very sparsely populated with only 214 persons per square mile by 1901. However if the 38 percent of the total area which is occupied by reserved forests is excluded the density will rise to 346 persons per square mile (O' Malley, 190, pp. 35, 38). However the density has been increasing continuously over the years and stands at 586 per square km according to 2011 Census (Table 3.11). During the seventy years since 1941 to 2011 the population density has increased almost five times. Among the three hill sub-divisions the highest population density can be found in Darjeeling Sadar sub-division followed by Kurseong and Kalimpong (Figure 3.4).

Table 3.11: Density of Population of Darjeeling District, 1901-2011

Year	1901	1921	1941	1961	1981	1991	2001	2011
Density of Population per square km	208*	236*	314*	497*	325	413	511	586

Note: * persons per square mile.

Source: Data upto 1961- Das and Bhumali, 2011, pp. 43-44. Data for 1981-calculated from Primary Census Abstract Darjeeling District, 1981. Data for 1991-2011-calculated from Census of India, 1991-2011 (Census of India website-www.censusindia.gov.in)



Source: Data for 1951-1971-Sanyal (1986). Data for 1981-Compiled from Primary Census Abstract, Darjeeling Data for 1991-2011- Compiled from Census of India, 1991-2011 (Census of India website-www.censusindia.gov.in)

Figure 3.4: Density of Population per square km, Darjeeling Hills, 1951-2011

3.5.3. Urbanization

“From a sociological point of view urbanisation means the spread of urbanism” which is regarded as a phenomenon that “automatically leads to a substantial transformation in a person’s way of life such as changes in attitudes, values or behavioural patterns” (Chatterjee, 2006 cited in Das, 2014, p. 79). The development of Darjeeling as a hill station leading to urbanization began with the establishment of a sanatorium by the British army personnel. However, the real catalyst was the establishment of the tea gardens which gave birth to Darjeeling town along with popular towns like Kurseong and Kalimpong (Das, 2014, p.79). The emergence of Mirik as a new town in the later decades is also an extension of tea garden and tourist centre (Desai, 2014, p. 146). The physical configuration of the Darjeeling

Himalayas which is comprised of hills, ridges, spurs and deep valleys has also greatly influenced the development and distribution of urban settlements in the region, producing a settlement pattern markedly different from the rest of the state (Dasgupta, 1986).

West Bengal belongs to the group of states which is relatively more urbanised with the state average being slightly higher than the all India average. The North Bengal region to which the district belongs has 18.70 percent of population residing in urban areas. With the exception of the districts of Darjeeling and Jalpaiguri the other districts of the region have low proportion of urban population. It has been noted that the level of urbanisation in the Darjeeling Hills soared from 17.24 percent in 1971 to 21.59 percent in 1981 (Das, 2014, p. 80). Further, the Darjeeling hill areas has had a very high growth in the level of urbanisation, as such it has become the most urbanised of all hill urban areas of the Eastern Himalayas (*ibid*). Table 3.12 shows the percentage of urban population in the Darjeeling Hills, Darjeeling district and West Bengal for 1991-2011.

The proportion of urban population shows an increasing trend in the hills, district, the state and the entire country since 1991. In the Darjeeling district a little less than 40 percent of the population resides in urban areas according to 2011 Census.

Table 3.12: Percentage of Urban Population in Darjeeling Hills, Darjeeling District and West Bengal, 1991-2011.

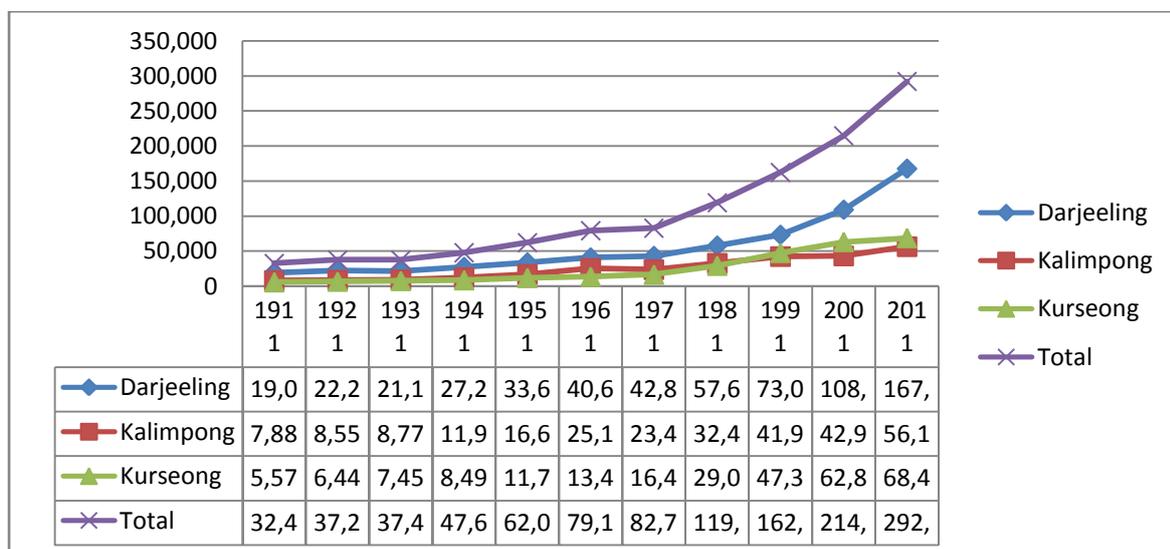
Years	1991			2001			2011		
	Person	Male	Female	Person	Male	Female	Person	Male	Female
Darjeeling Hills	23.71	23.87	23.53	27.15	27.64	26.64	33.35	33.12	33.59
Darjeeling District	30.47	31.21	29.66	32.34	32.99	31.65	39.42	39.51	39.32
West Bengal	27.48	28.35	26.53	27.97	28.58	27.32	31.87	31.97	31.77
India	25.73	26.18	25.25	27.82	28.29	27.31	31.14	31.37	30.91

Source: Compiled from Census of India, 1991-2011 (Census of India website-www.censusindia.gov.in)

The percentage of urban population in the hill areas is however 33 percent in 2011 which is lower than that for the district. The hill areas as well as the district however, show higher percentage of urban population compared to the state and the entire country. Among the three hill sub-divisions, Darjeeling sub-division has a larger number of urban population in comparison to Kurseong and Kalimpong sub-division (Figure 3.5). The increase in the percentage of urban population is higher for the females as compared to the males between 2001-2011 for the Darjeeling district including the hills as well as for the state and the country. The character of male and female urbanization is significantly different as the

reasons for their migration to urban areas may not be the same. While men migrate in search of better employment opportunities, women migrate when they marry or when the whole family migrates. They seldom do so in search of better employment opportunities (Mehrotra, cited in Banerjee and Mukherjee, 2005).

The increasing population density and the rates of urbanisation are associated with numerous problems related to lack of civic amenities like sanitation, water supply, growth of slums, and increase in criminal activities etc. which adversely affect the quality of life of the women folk and their status (*ibid*). Desai (2014) notes that most of the hill towns, almost 70 percent are small in character but accommodate less than 40 percent of the urban population (Desai, 2014, p. 148) which is an indication of the growing urban density. In Darjeeling hill areas too medium and small towns are expanding quite rapidly. Urbanisation in the Darjeeling hills, notes Dasgupta (1986), is characterised by “uncontrolled and unplanned haphazard growth, mushrooming of squatter colonies through illegal and forceful occupation of land, inadequate urban facilities like water supply, sewerage etc. and congested and unhealthy living conditions” with negative impacts on the health and quality of life of the people including women living in these areas.



Source: Data for 1911-1971-Compiled from Dasgupta, 1986. Data for 1981-Primary Census Abstract, Darjeeling, 1981. Data for 1991-2011-Compiled from Census of India, 1991-2011 (Census of India website-www.censusindia.gov.in)

Figure 3.5: Growth of Urban Population, Darjeeling Hills, 1911-2011

Further, the proliferation of the township along downward slopes has made the region prone to natural calamities like landslides (Maitra, 1986). It has been mentioned by Haigh and

Vallely (2010) that both in developing and developed countries, there is evidence to suggest that women are more likely to die as a result of natural calamities due to climate change, and if they survive, suffer more in the aftermath due to heavier burden of workload in the process of rebuilding their households. The many challenges that women face as a consequence of natural disasters may in turn affect their ability to return to paid employment, since women are generally concentrated in the informal sector, which often suffers most when disasters strike and recovers the slowest (Masika, 2002 cited in Haigh and Vallely, 2010).

The disproportionate growth of urban settlements in the Darjeeling hill region has led to an increase in demand for employment along with social and civic services of a very large magnitude which cannot be provided by the resources of this region (Maitra, 1986). The problems of unemployment, stagnation and low income which are the inevitable consequences of urbanisation have also fuelled the flames of political upheavals in the region (*ibid*). Since the hill towns and cities have not emerged due to planned intervention but expanded as trade centres, their expansion needs to be controlled and must be in an environmentally sustainable manner (Desai, 2014, p. 148).

3.5.4. Age Distribution of Population

Besides the total size, the age and sex structure of the population is an important demographic characteristic of the population as it determines the future growth potential of an economy, besides being a basic determinant of a nation's supply of manpower and influences requirements for essential goods and services (Premi, 2006, p. 103). The sex-age structure of a population at any time is the result of past levels of fertility, mortality and migration and has an effect on present levels of birth and death rates and rate of future population growth rates (*ibid*). As a consequence of the demographic transition that almost all countries pass through which is characterised by decline in death rates faster than decline in birth rates, a country's population may grow rapidly with a higher proportion of the younger age groups. However, within a period of 15-25 years the younger age population reaches the working age and the productive capacity of the economy expands and demographic dividends may be reaped in the form of increase in the size of the labour force and its repercussions on the economy due to increased human and physical capital formation. For women it may imply an increase in workforce participation due to decline in fertility (Bloom, 2011). India, passing through this stage of demographic transition has one of the largest proportions of population in the younger age groups. Due to this large base India has high potential for future growth though it may take another 20-30 years for the population to become stationary.

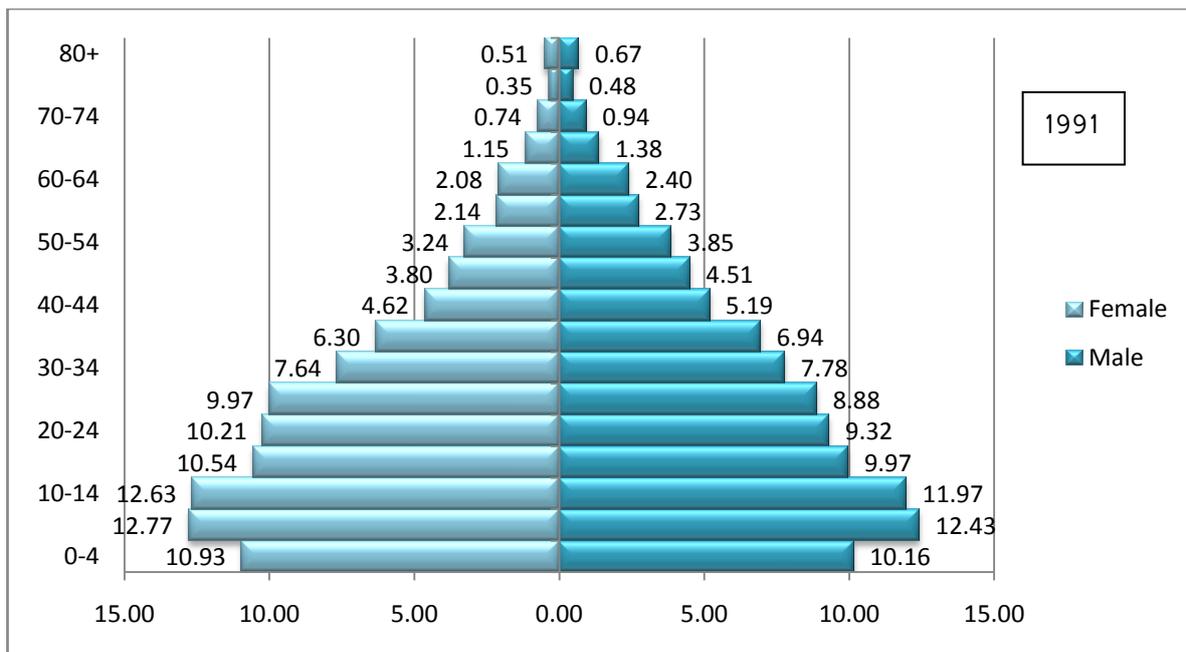
Table 3.13: Percentage Distribution of Population by Age Group, Darjeeling District, 1991- 2011

Age Group	1991		2001		2011	
	M	F	M	F	M	F
0-4	10.16	10.93	8.29	8.56	7.11	7.01
05-09	12.43	12.77	10.84	10.95	8.91	8.71
10-14	11.97	12.63	12.11	12.24	10.24	10.13
15-19	9.97	10.54	10.71	10.78	10.3	10.1
20-24	9.32	10.21	9.04	10.11	9.68	10.34
25-29	8.88	9.97	8.43	9.58	9.24	9.92
30-34	7.78	7.64	7.76	7.89	7.89	8.29
35-39	6.94	6.3	7.65	7.59	7.66	8.08
40-44	5.19	4.62	6.25	5.47	6.8	6.61
45-49	4.51	3.8	5.09	4.54	5.75	5.6
50-54	3.85	3.24	3.84	3.39	4.87	4.47
55-59	2.73	2.14	2.81	2.45	3.5	3.25
60-64	2.4	2.08	2.38	2.28	2.89	2.76
65-69	1.38	1.15	1.81	1.66	1.98	1.81
70-74	0.94	0.74	1.27	1.1	1.42	1.28
75-79	0.48	0.35	0.65	0.52	0.79	0.7
80+	0.67	0.51	0.77	0.72	0.84	0.83
ANS	0.4	0.38	0.31	0.17	0.13	0.12
Total	100	100	100	100	100	100

Source: Compiled from Census of India, 1991-2011 (Census of India website-www.censusindiagov.in).

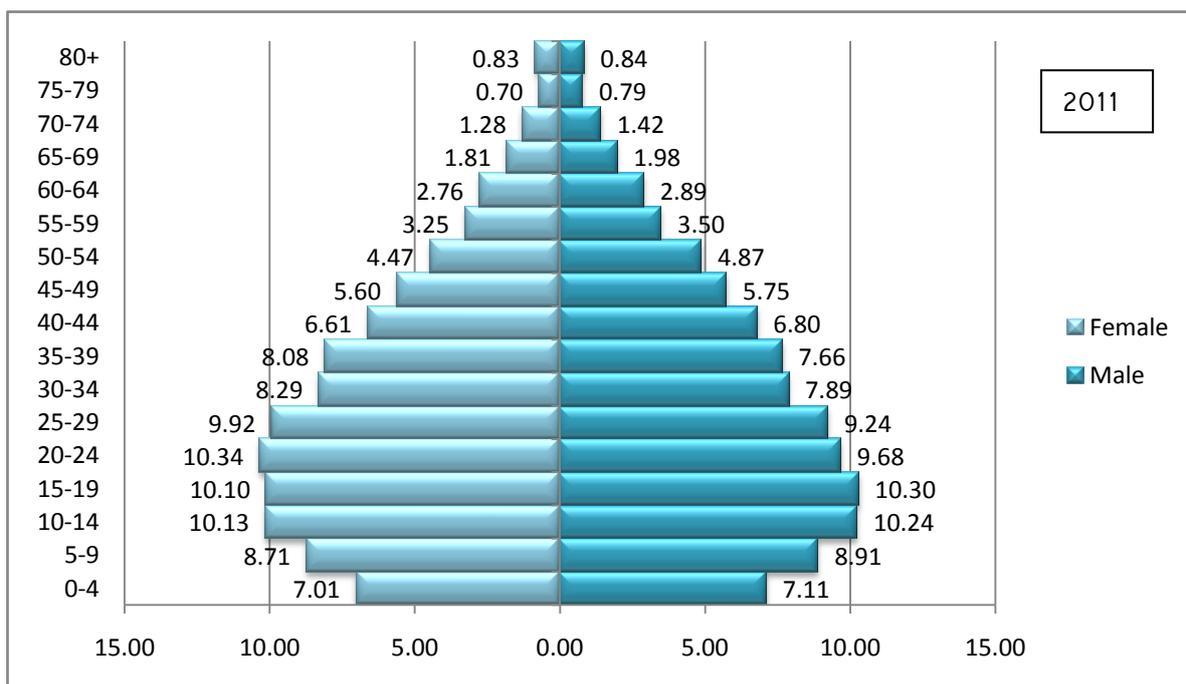
Note: M-Male, F-Female

The age structure of a population is generally represented in five yearly age groups. Table 3.13 which shows the age-sex structure of the population for the Darjeeling district reveals that the share of population in the age groups 0-4, 5-9 and 10-14 years has shown a decline between 1991-2011 except for the 10-14 age group for males which has shown a slight increase between 1991-2011. The decline in the share of the child population could be attributed to the declining birth rates. This decline also implies a decline in the child dependency rate. The share of the adult population i.e. most of the age groups between 15-59 years has shown an increase. This is the population in the working age group and increase in their share could mean an increase in work participation rates. The share of the aged population has also shown a continuous increase since 1991 which could be the result of increase in life expectancy. This also increases the dependency ratio and calls for social security measures for the older section especially women since women in the older age group form a vulnerable social group as they may be jobless or widowed or without any kinship and may be subject to illness and poor health (Banerjee and Mukherjee, 2005).



Source: Compiled from Census of India, 1991 (Census of India website-www.censusindia.gov.in)

Figure 3.6: Age-Sex Pyramid, Darjeeling District, 1991



Source: Compiled from Census of India, 2011 (Census of India website-www.censusindia.gov.in)

Figure 3.7: Age-Sex Pyramid, Darjeeling District, 2011

3.5.5. Sex Ratio

Sex ratio defined as the number of females per thousand males is an important indicator of gender development and the relative status of women in the society as it can be used to assess

relative excess or deficit of men or women in a given population at that point of time. It has also been regarded as an indicator of inequality in intra-household allocation between boys and girls (Dreze and Sen, 1995, p.144). It also provides information about the present settlement pattern of an area besides being an indicator of future demographic pattern, with a high sex ratio indicating a stable settlement and a lower sex ratio a male dominated settlement pattern which is indicative of a migratory population (Desai, 2014, p. 146). The population sex ratio depends on three factors: the sex ratio at birth, differential mortality rates between men and women at different ages, and losses and gains through migration (Coale, 1991, cited in Hesketh and Xing, 2006). Sex ratio at birth favours males but females being more resistant to diseases have greater overall longevity; which implies that in the absence of discrimination in access to health care and nutrition females have lower mortality across all age groups (Sen, 1992 cited in Hesketh and Xing, 2006). However, the deficit of women in the population is evidence of the discrimination that women face in their capacity to survive which according to scholars is the outcome of a complex nexus of socio-cultural forces which come into play right from the time of conception and continue even after birth (Banerjee and Mukherjee, 2005) due to the tradition of son preference. The discrimination against women is manifested in their unequal access to “life supporting resources such as food, nutrition and health care, especially during childhood” (Som and Mishra, 2014).

Many parts of the Third World have sex ratios well below unity in contrast to Europe and North America (Dreze and Sen, 1995, p. 141). India is one of the several Asian countries with low sex ratios although there have been improvements in the different Census years. However there are inter-regional variations in sex ratio in the country with the southern states particularly Kerala showing better status of women as compared to large parts of north India, especially the north-western states (Banerjee and Mukherjee, 2005). This is a reflection of the character of gender relations in different parts of the country (Dreze and Sen, 1995, p. 142). West Bengal’s sex ratio has never been better than that of India as a whole which has been attributed partly to the migration of males from surrounding areas for purpose of employment. However when the sex ratio was adjusted for migration it was found to show considerable improvement and stood close to the all India level (Banerjee and Mukherjee, 2005). Darjeeling district has shown an alternate rise and fall in the sex ratio since 1901 and has a lower sex ratio than most of the hill areas of North-East India and the averages for West Bengal and India which points to the presence of floating migratory population in Darjeeling (Dasgupta, 1990, p. 15). Darjeeling district’s sex ratio has shown an improvement during 2001 and 2011 and is higher than that for West Bengal and India which could point to out

migration of males from the district to cities and towns for better employment opportunities. The out migration of male increases the work burden of the women folk left behind in domestic as well as care activities as substantiated by several studies.

Table 3.14: Sex Ratio in Darjeeling Hills, Darjeeling District, West Bengal and India, 1901-2011

Years	Darjeeling	Darjeeling	West Bengal	India
1901	-	876	-	972
1911	-	871	-	964
1921	-	898	-	955
1931	-	881	-	950
1941	-	884	-	945
1951	-	863	865	946
1961	-	864	878	941
1971	-	862	891	930
1981	924	893	911	934
1991	946	913	917	927
2001	969	937	934	933
2011	989	970	950	943

Source: Data for Darjeeling District 1901-1981- Dasgupta, 1990, p. 14. Data for West Bengal and India for 1971 and 1981-Banerjee and Mukherjee, 2005. Data for Darjeeling, West Bengal and India for 1991-2011- Compiled from Census of India, 1991 (Census of India website-www.censusindia.gov.in) Data for West Bengal 1951-1961-Som and Mishra, 2014. Data for India 1901-61-Premi, 2006.

Child sex ratios (CSR) are considered to be better than the overall sex ratio in indicating the status of women as it is not affected by sex-selective migration (Som and Mishra, 2014). The CSR reflects the discrimination that children are subjected to prior to birth through sex-selective abortion of female foetuses, and after birth through infanticide and subsequent neglect of females in the later years. The sex ratio was calculated separately for the age groups 0-6 years and 7 years and above for the first time in the 1991 Census (Premi, 2006, p. 106). From Table 3.15 it is clear that the CSR is showing a declining trend from 1991-2011 for the district as well as the state and India though the district fares better than the state and the country. The declining CSR is not a welcome trend and is indicative of the gender discrimination in the early years of life. It may also result in demographic imbalance over time.

Table 3.15: Child Sex Ratio (0-6 years) Darjeeling District, West Bengal and India, 1991-2011

Years	Darjeeling	West Bengal	India
1991	976	967	945
2001	962	960	927
2011	952	956	919

Source: Compiled from Census of India, 1991-2011 (Census of India website-www.censusindia.gov.in)

3.5.6. Literacy Rate

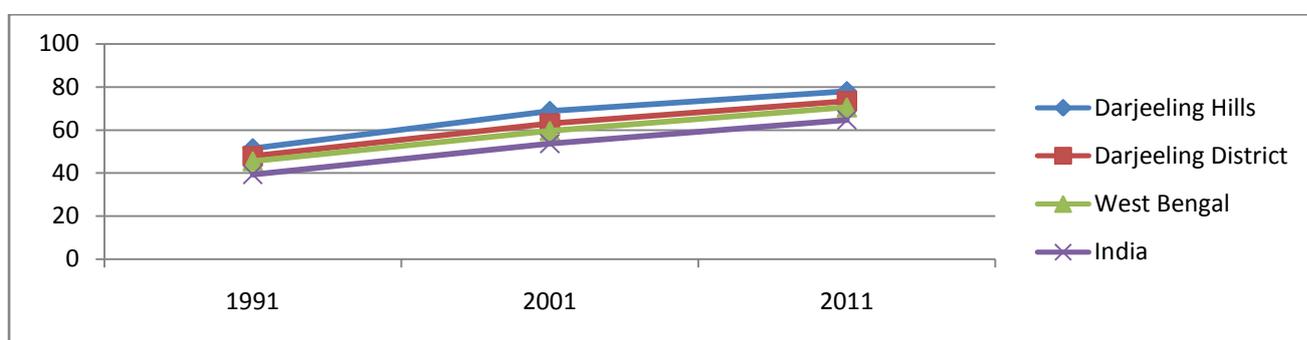
Access to education, particularly basic education is of crucial importance in achieving economic development (Dreze and Sen, 1995) as being educated strengthens other dimensions of human development by expanding the choices people make. Being literate, according to Dreze and Sen is instrumental in self-defence since social interaction often involves the written media, and basic education acts as “a catalyst of social change” (Dreze and Sen, 1995, p. 109). The World Bank has also acknowledged the importance of education as is apparent in the Bank’s statement according to which education, especially basic education is an important means of poverty reduction which can be achieved by increasing the productivity of the poor, improving health, reducing fertility and equipping people with the necessary skills which enables them to participate fully in economy and society (World Bank 1995, p. 1). In this context female literacy rates are even more significant in determining the overall status of women and their family members especially the girl children. Women’s education is known to have positive impacts on social, human and economic development as it leads to late marriage, lower levels of fertility, low maternal and child mortality rates and lower population growth in the long run. Women’s education also helps to achieve women’s social, economic and political empowerment. Investment in female education as an important development strategy has thus been emphasised by the World Bank due to its high rates of social return (Oxaal, 1997). However, it is only recently that female education has been recognized as a social issue in India, with female literacy gaining prominence only during the twentieth century (Dreze and Sen, 1995, pp. 132-133). Educational attainment is measured by levels of literacy generally defined as the percentage of literate population above the age of six years. According to the Human Development Report, 1990 although the figures for literacy only crudely reflect access to education, it is nonetheless “a person’s first step in learning and knowledge-building”, so literacy rates are an important component of any measure of human development (UNDP, 1990, p. 12).

Table 3.16: Literacy Rate, Darjeeling Hills, Darjeeling District, West Bengal and India, 1991-2011

Years	1991			2001			2011		
	Person	Male	Female	Person	Male	Female	Person	Male	Female
Darjeeling	61.4	70.8	51.4	77.0	85.0	68.8	83.8	89.6	78.0
Darjeeling	58.0	67.1	47.8	71.8	80.1	62.9	79.6	85.6	73.3
West Bengal	57.7	67.8	46.6	68.6	77.0	59.6	76.3	81.7	70.5
India	52.2	64.1	39.3	64.8	75.3	53.7	73.0	80.9	64.6

Source: Compiled from Census of India, 1991-2011(Census of India website-www.censusindia.gov.in)

According to the first census that was carried out in independent India in 1951, only one-fourth of the population of the state was literate (Basak and Mukherjee, 2012). In 2011 however, more than three quarters of the population above the age of seven years are literate. The literacy rate for the Darjeeling hills has been higher than the district average which has also been higher than the state and the all India average for both males and females. The upward trend in the female literacy rates as can be seen from Figure 3.8 is a positive indication. Nevertheless, although the increasing and high levels of female literacy rates indicate improvement in the status of women, its importance should not be over emphasised. It should be analysed with respect to other indicators of women's well being.



Source: Compiled from Census of India, 1991-2011(Census of India website-www.censusindia.gov.in)

Figure 3.8: Trends in Female Literacy Darjeeling, West Bengal and India, 1991-2011

3.5.7. Marital Status

Table 3.17 shows the distribution of male and female population of different age groups by marital status for the period 1991-2011. The table reveals that below 20 years of age there is a larger proportion of male population who are not married as compared to the females. In 2011 while only about 3 percent of the male population below the age of 20 are married, a little less than 10 percent of the female population are married showing that girls are getting married at a younger age than boys. Early marriage leads to early childbirth with adverse impacts on the health of young mothers and their children. In the age group i.e. 20-29 less than 50 percent of the males are married as compared to females in all three Census years whereas more than 70 percent of the female population in that age group was married in 1991 and 2001 which decreased to a little less than 70 percent in 2011. A closer look at the percentage of widowed population reveals that for all age groups the percentage of widowed female population is greater than that for men. For higher age groups there is a higher percentage of female population who are widowed. For the 70+ age group more than 60

percent of the female population is widowed as compared to male population whose percentage is less than 25 percent for all three census years. Widowed women especially in the older age group constitute a vulnerable section since they are in poor health, may not have regular source of income and are dependent on their children or relatives. Separated or divorced population is negligible.

Table 3.17: Distribution of Population by Age Group and Marital Status, Darjeeling, 1991-2011

Age	Never Married		Married		Widowed		Divorced/Separated	
	Male	F	M	F	M	F	M	F
1991								
10-19	97.82	86.47	2.09	10.18	0.02	0.06	0.05	0.12
20-29	54.36	24.46	45.03	74.36	0.32	0.87	0.28	0.62
30-39	13.34	6.06	85.15	88.80	1.06	3.27	0.44	0.92
40-49	38.75	23.31	59.94	70.50	0.94	3.18	0.35	0.77
50-59	4.20	2.59	88.51	72.96	6.55	22.70	0.74	0.87
60-69	3.31	1.79	82.36	52.74	13.59	43.98	0.74	1.00
70+	8.31	3.03	66.35	28.64	23.94	66.60	1.06	0.40
2001								
10-19	98.03	89.77	1.84	9.89	0.05	0.19	0.08	0.15
20-29	53.94	25.44	45.24	72.64	0.40	1.03	0.42	0.90
30-39	12.94	7.39	84.78	87.32	1.16	3.82	1.13	1.47
40-49	5.50	5.27	90.93	82.76	2.31	10.36	1.27	1.62
50-59	4.25	4.67	88.98	71.15	5.66	22.81	1.12	1.38
60-69	4.36	4.57	81.21	51.79	13.50	42.51	0.93	1.12
70+	6.43	5.23	67.55	33.28	24.99	60.55	1.03	0.93
2011								
10-19	97.26	90.23	2.60	9.45	0.05	0.17	0.08	0.15
20-29	56.83	29.96	42.34	68.28	0.29	0.83	0.54	0.92
30-39	14.19	9.02	83.77	85.77	0.83	3.52	1.20	1.70
40-49	6.31	5.70	90.34	81.86	2.00	10.44	1.36	2.00
50-59	4.61	5.26	89.30	71.05	4.82	21.94	1.26	1.74
60-69	4.38	5.23	83.87	51.69	10.67	41.72	1.08	1.36
70+	5.26	5.58	69.59	31.16	24.09	62.38	1.05	0.88

Source: Compiled from Census of India, 1991-2011(Census of India website-www.censusindia.gov.in)

3.6. CONCLUSION

The present chapter provides a brief introduction of the study area in terms its history, geography, economy and demography as these factors are important in planning and designing policies catering to the precise needs and specificities of the region. The history of Darjeeling, much like the weather presents a record of constant changes with frequent

invasions and conquests by the neighbouring countries like Nepal, Bhutan and Sikkim vying with each other for possession of the region (Das, 2014). In 1840 Darjeeling was officially recognised as a district (*ibid*, p.38), and in 1866 with the final addition of Kalimpong the district reached its present dimensions (Dash, 1947, p. 41).

The physical configuration of the region characterised by ridges and narrow valleys (Dash, 1947) of differing altitudes, the different rivers that drain the region, along with the climatic variations has had a significant effect in the economy of the region. The climate of the region is favourable for tea cultivation, and the tea industry is an important employment provider along with the tourism industry. Besides, agriculture is also a key contributor to the economy of the Darjeeling hills. However, the sectoral composition of the NSDP and NDDP reveals the declining share of the primary and secondary sectors and the increasing share of the tertiary sector for the district.

Agriculture in the region is greatly influenced by the altitude and slope aspect and the methods of cultivation in the hills vary with the crops to be grown. The cropping pattern is affected by the altitude and no crops are grown above 2,895 meters due to the cold. The district has lower productivity levels as compared to the other districts and to the state average for almost all crops which could be attributed to the prevalence of small and marginal holdings which may further be fragmented and scattered; infertile land; poor irrigation facilities and inability to use modern technology. However, in recent years diversification in cropping pattern towards high value cash crops and horticulture and floriculture is taking place which would help achieve higher growth rates in agriculture besides augmenting the income of the farming communities in the region.

An analysis of the demography of the region reveals that the region has been experiencing increasing population density and increasing urbanisation which are associated with numerous problems related to lack of civic amenities like sanitation, water supply, growth of slums, increase in criminal activities, vulnerability to natural disasters like landslides etc. which adversely affect the quality of life of the women folk and their status. The sex ratio in the Darjeeling hills is relatively higher than that for West Bengal and India which could point to out migration of males from the district to cities and towns which lead to increase in women's work burdens. However, the Darjeeling hills witness higher literacy rates in comparison to the district average which has also been higher than the state and the all India average for both males and females which is a positive indication. However, its importance should not be over emphasised and should be analysed with respect to other indicators of women's well being.

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Chapter IV

Structure of Women's Work Participation Rates in Darjeeling

4.1. INTRODUCTION

Labour supply plays a very important role in the economic development of any nation. “A robust and ample labour force promotes development, and development in turn, feeds back on labour market conditions” (Atal, 2017). Economists mention two important features to be of prominence during the modernisation of a country's labour market. Firstly, as stated by Lewis “surplus labour” from the traditional sector basically the agricultural sector is transferred to the modern industrial sector and the industrial sector expands. Secondly, with modernization of the labour market, the skill and educational levels of the workforce show improvement as new industries emerge which “demand higher labour skills” (Thomas, 2012). Thomas' study mentions that the process of modernisation of India's labour force has begun, albeit a little late, which is evident in the movement of the labour force away from agriculture since 2009-10, and also in significant improvement in the educational level of the workforce in the country. Nonetheless, given the slow rate of growth of employment in the non-agricultural sector, decline in the size of the manufacturing workforce in the country between 2004-05 and 2009-10, and withdrawal of women from the labour force on a large scale, the modernisation of the labour market continues to be a major challenge for India's progressive transformation (*ibid*).

Any discussion on the labour force of an economy requires defining the labour force and the labour force participation rate. The 68th Round of the National Sample Survey (NSS) on employment and unemployment in India defines labour force as that part of the population which supplies or is willing to supply labour for pursuit of economic activities for the production of goods and services and therefore includes ‘employed’ and ‘unemployed’ persons/person-days. Labour-force participation rate (LFPR) may be defined as the proportion of persons/person-days in the labour-force to the total persons/person-days with the ratios being given in per 1000 of persons/person-days (GoI, 2013). The report further states that being dynamic and multidimensional; the activity participation of the people varies over regions, education, age, gender, industry and occupational categories (*ibid*). Contrary to activities such as unpaid household work, volunteer work, education, or retirement, the labour force participation decision may be regarded as a decision to participate in paid activities in the labour market (Benjamin, Gunderson and Riddell, 1998). This therefore means that

important sections of the population, particularly the women engaged in unpaid family work or domestic activities and contributing significantly to the country's production are excluded from the labour force (Psacharopoulos and Tzannatos, 1989). Changes in the labour force participation decision has important and far reaching effects on the economy as it influences the size and composition of the labour force which affects growth, unemployment rates along with occupational and sex composition of the labour force; which in turn affects relative wages, demands for unionization, day care, and equal pay and equal employment opportunity legislation (Benjamin et.al., 1998).

In India there are two sources of data on employment available at the national level - the decennial Census data and the various quinquennial rounds of the National Sample Survey (NSS). Taking data from the two sources the present chapter presents an analysis of female labour force/work participation rates for the district of Darjeeling. At the outset the chapter presents a discussion on female labour force/work participation rates for India and West Bengal using NSS data to have an understanding of the situation of female employment in the country and the state. This is followed by an analysis of work participation rates for Darjeeling district using Census data for the period 1991-2011. The analysis is intended to highlight the trends and patterns of women's employment in the district to understand women's situation.

4. 2. INDICATORS OF EMPLOYMENT- ANALYSIS OF NSS DATA

4. 2.1. Labour Force Participation Rates (LFPR)

In India the primary source of various indicators of the labour force at national and state levels is the all India Employment and Unemployment Surveys conducted by the National Sample Survey Office (NSSO). Taking large samples of households, NSS surveys on employment and unemployment are being conducted quinquennially since 1972-73 when the 27th Round (October 1972- September 1973) was undertaken and the ninth quinquennial survey was undertaken in the NSS 68th Round (July 2011-June 2012). The main objective of these surveys, as mentioned in the NSS reports is to obtain estimates of level parameters of various characteristics of employment and unemployment at national and State/UT level which are necessary for planning, policy formulation and decision making at various levels, both within and outside the government (GoI, 2013). In the NSS the employment and unemployment indicators are measured according to three different approaches, viz. *usual status* (US) which has a reference period of one year, *current weekly status* (CWS) which has a reference period of one-week and *current daily status* (CDS) which is based on the daily

activity pursued by individuals on each day of the reference week. In US and CWS, the labour force indicators are measured in persons while in CDS it is measured in person-days. The activity status is determined on the basis of major time criterion in the US approach while both in CWS and CDS, it is determined on the basis of priority-cum-major time criterion. For usual status approach, the indicators are measured for the usual principal status (known as *usual status (ps)*) and usual status taking principal and subsidiary activity together (known as *usual status (ps+ss)*) (*ibid*).

The Indian labour market is characterized by low labour force participation rates and low work participation rates, especially for females. As estimated by the NSS 68th Round, among a population of 1,227 million as on 1st January 2012, out of which 68.56 percent reside in the rural areas and 31.44 percent in the urban areas, only 483.7 millions entered the labour force according to the *usual status (ps+ss)* which gives a labour force participation rate of only 39.5 percent. Among the 483.7 million people in the labour force, 351.3 million (72.6 percent) are males and the remaining 132.4 million (27.4 percent) are females, giving a male labour force participation rate (LFPR) of 55.6 percent and female LFPR of 22.5 percent according to the *usual status (ps+ss)*. The workforce in the *usual status (ps+ss)* as on 1st January 2012 stood at 472.9 million giving a work participation rate of 38.6 percent, with the rates for males and females being 54.4 and 21.9 percent respectively; while the absolute number of unemployed was 10.8 million giving an unemployment rate of 22 percent with the male and female unemployment rates being recorded at 21 percent and 24 percent respectively.

The Labour Force Participation Rates (LFPR) per 100 persons according to the different activity status for the different rounds of NSS is shown in Table 4.1. The NSSO data for 2011-12 shows that according to the *usual status (ps+ss)*, the labour force participation rate is almost 40 percent out of which the rate for the rural areas is 41 percent and for urban areas 37 percent. For rural males the rate is about 55 percent against 25 percent for rural females. In the urban areas the rates for males and females were 56 and 16 percent respectively. It can be seen that the rates for females are much lower than the rates for males. It is also clear that the LFPRs for the females in the rural areas is almost half the LFPRs of the males, while in the urban areas the LFPRs for the females is even less than half of that for the males. While the rates for the urban females have shown a revival in 2011-12, the rates for the rural females have been declining continuously since 2004-05. This feature of decline in rural female LFPRs has been reported by several studies and has been a subject of much discussion among scholars (Chowdhury, 2011; Mazumdar and Neetha, 2011; Rangarajan, Kaul and

Seema, 2011; Neff, Sen and Kling, 2012; Mahapatro, 2013; Sanghi, Srijia and Vijay, 2015). Termed as “defeminisation of labour force” this decline has been identified as the single most important component that accounted for the decline in aggregate labour force during the period 2004-05 to 2009-10 as pointed out by several studies (Abraham, 2013).

Table 4.1: Labour Force Participation Rates (LFPR) per 100 persons (all ages) India, 1993-94 to 2011-12.

NSS Rounds	50th (1993-94)	55 th (1999-00)	61 st (2004-05)	66 th (2009-10)	68 th (2011-12)
Rural Males					
Usual Status (ps)	54.9	53.3	54.6	54.8	54.7
Usual Status (ps+ss)	56.1	54.0	55.5	55.6	55.3
CWS	54.7	53.1	54.5	54.8	54.5
CDS	53.4	51.5	53.1	53.6	53.4
Rural Females					
Usual Status (ps)	23.7	23.5	24.9	20.8	18.1
Usual Status (ps+ss)	33.0	30.2	33.3	26.5	25.3
CWS	27.6	26.3	28.7	23.1	21.5
CDS	23.2	22.0	23.7	19.7	18.0
Urban Males					
Usual Status (ps)	53.8	53.9	56.6	55.6	56.0
Usual Status (ps+ss)	54.3	54.2	57.0	55.9	56.3
CWS	53.8	53.9	56.6	55.6	56.1
CDS	53.2	52.8	56.1	55.0	55.5
Urban Females					
Usual Status (ps)	13.2	12.6	14.8	12.8	13.4
Usual Status (ps+ss)	16.5	14.7	17.8	14.6	15.5
CWS	15.2	13.8	16.8	14.1	14.8
CDS	13.2	12.3	15.0	12.9	13.6

Source: GoI, 1997, 2000, 2006, 2011, 2013(NSS 50th, 55th, 61st, 66th and 68th Rounds on Employment and Unemployment). Note: CWS-Current Weekly Status, CDS- Current Daily Status.

Given the fact that the decline of more than 21 million in the female workforce more than offset the 22.3 million increase in the male workforce during the period 2004-05 and 2009-10, there has been a new and increased urgency to understand the gender dimensions of employment trends in India (Mazumdar and Neetha, 2011). Since the workforce is a part of the labour force and consists of those who are seeking jobs including the employed as well as the unemployed, changes in the labour force are “bound to have an impact” on the workforce (Rangarajan et. al., 2011). Although scholars have cited several reasons for the decline in the female labour force participation rates, no single factor can satisfactorily explain it since it is complex outcome of the simultaneous effect of several factors (Sanghi et. al., 2015).

Mazumdar and Neetha (2011) note that the low LFPR of women is the result of neglecting women's unpaid work in the NSS data which gives a somewhat skewed picture of women's employment in the country. Besides, the study also mentions that less attention is paid to specifying and enumerating women's paid employment and advocates the need to do so. It is also believed that more women especially in the rural areas are opting out of the labour force in pursuit of education leading to a decline in labour force participation rates (Rangarajan, 2011; Himanshu, 2011), although Chowdhury (2011) argues that it is doubtful as to whether this can be put forward as an explanation for a fall in the female LFPR because unlike for men where the decline has been observed for the age groups 15-19 and 20-24, the LFPR for women has decreased for all ages above the age of 15. In view of the sharp increase in LFPRs in the previous period (2004-05) being attributed to distress employment (Abraham, 2009), the decline in the following periods could indicate decline in the distress and "return to normality" (Himanshu, 2011). With increase in household income as a result of increasing real wages and improved income-earning opportunities for male members of the family (Rangarajan et. al., 2011; Thomas, 2012); agriculture being more drought resistant and public works programmes like NREGA providing supplementary jobs (Himanshu, 2011; Rangarajan et. al., 2011) women who were previously in the labour force may opt out to attend to domestic duties (Rangarajan et. al., 2011; Thomas, 2012; Abraham, 2013). This is the income effect leading to a decline in the participation rates for women. The decline in women's labour force participation has also been attributed to decline or absence of short and long term employment opportunities in rural areas especially in the non-farm sector (Chowdhury, 2011; Sanghi et. al., 2015) and cultural and social factors (Chowdhury, 2011). Chowdhury (2011) argues that as a consequence of the financial crisis of 2008 which adversely affected India's exports, many women working in these export industries may have been out of their jobs and could not be re-absorbed in the labour market. He further argues that with a fall in overall employment opportunities in the economy, women more than men may have been pushed out of their jobs due to social orthodoxy (*ibid*). Neff et. al. (2012) however believe that although social and cultural barriers restrict women's entry into the labor force in India, there is no support for such amplifying effects and may thus not be an important factor in explaining the decline in rural LFPRs. It has been mentioned by Sanghi et. al. (2015) that an increase in rural incomes may cause women to withdraw from the labour market as they would now be unwilling to take up casual work with low remuneration as such jobs may not be according to their preferences. Further, since women have low skills, rural non-farm sector jobs are also limited which also leads to their non-participation in the labour

market. Though several explanations have been put forward for the decline in the rural LFPRs, an important characteristic of female employment that emerges from this phenomenon is that the decline may be an indication that women's income is still a supplementary, short-term and part-time source and not a part of the mainstream (Rangarajan, 2011).

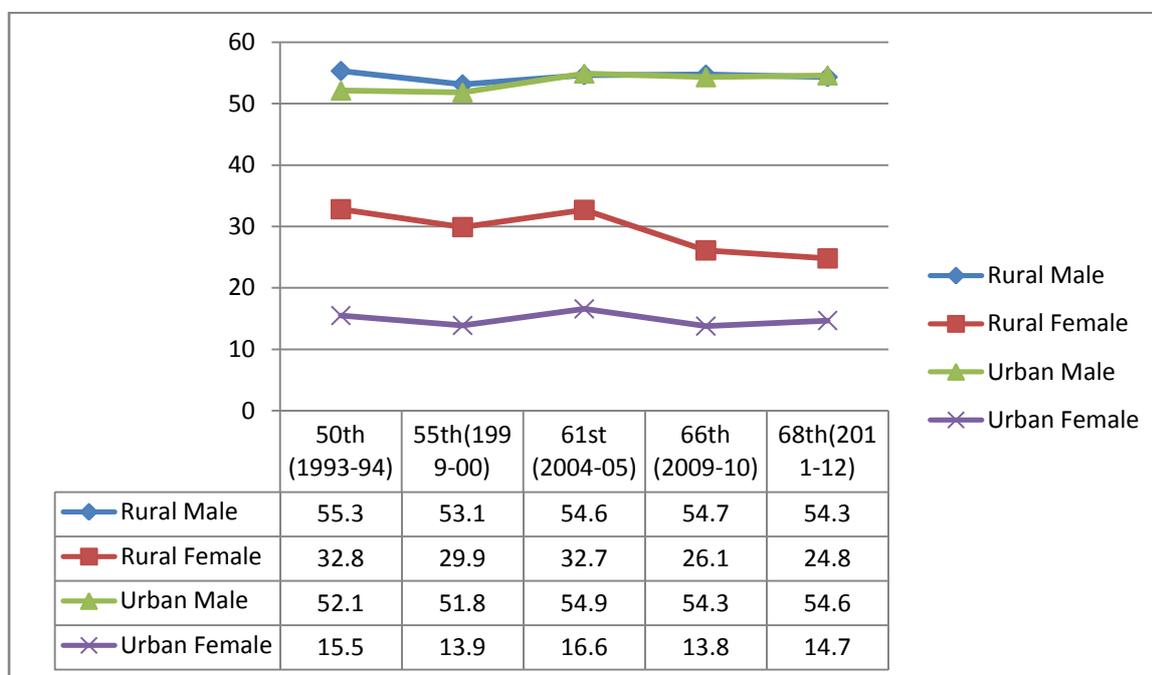
4.2.2. Work Participation Rates (WPR)

Employment is a crucial tool for reducing poverty and enhancing women's status (Srivastava and Srivastava, 2010). It is usually measured in terms of Work Participation Rates (WPRs) for various segments of the population which shows the proportion of the working population to the total population of any region and is an important indicator of development since it shows the size of the population who are working or employed. A higher WPR is generally regarded as an indicator of well being of any region. On the contrary, a higher WPR in poor regions indicates distress and poverty rather than improved well being. For women this may lead to increase in "drudgery" (*ibid*). Hence it is important to take into consideration the qualitative aspect of WPR in terms of the nature, pattern and duration of employment, the conditions of work and the wages (Awasthi, 2012, p. 100). The WPR is determined by a variety of factors including age and sex composition, attitude towards and availability of work etc. and show significant variations between different countries and different time periods within the same country (Das and Bhumali, 2011, p. 108).

According to the *usual status (ps+ss)*, the work force includes (a) the persons who worked for a relatively long part of the 365 days preceding the date of survey and (b) those persons from among the remaining population who had worked at least for 30 days during the reference period of 365 days preceding the date of survey (GoI, 2013). The trend in Work Participation Rates (WPRs) for workers by sex and residence in India and West Bengal according to the *usual status (ps+ss)* for the different NSS Rounds is shown in the Figures 4.1 and 4.2 respectively.

As in most of the countries of the world, especially developing countries, the WPRs for the females is much lower than the WPRs for males in India and West Bengal as is clear from Figures 4.1 and 4.2. A primary reason for this is due to the fact that much of the work that women do is unpaid and hence invisible in employment statistics. According to the 68th Round of NSS data for 2011-12, the male WPRs for rural and urban areas were 54.3 percent and 54.6 percent respectively; and the female WPRs for the same were 24.8 percent and 14.7 percent respectively. In West Bengal the rates for males were 58.6 percent and 60.2 percent in rural and urban areas respectively, whereas for the females the rates were 18.9 percent and

17.4 percent respectively. A comparison of the WPRs for West Bengal with all India level shows that though the rates for males are higher in the state in both rural and urban areas, the rates for females are lower than the all India level except for urban females in the last two NSS Rounds.

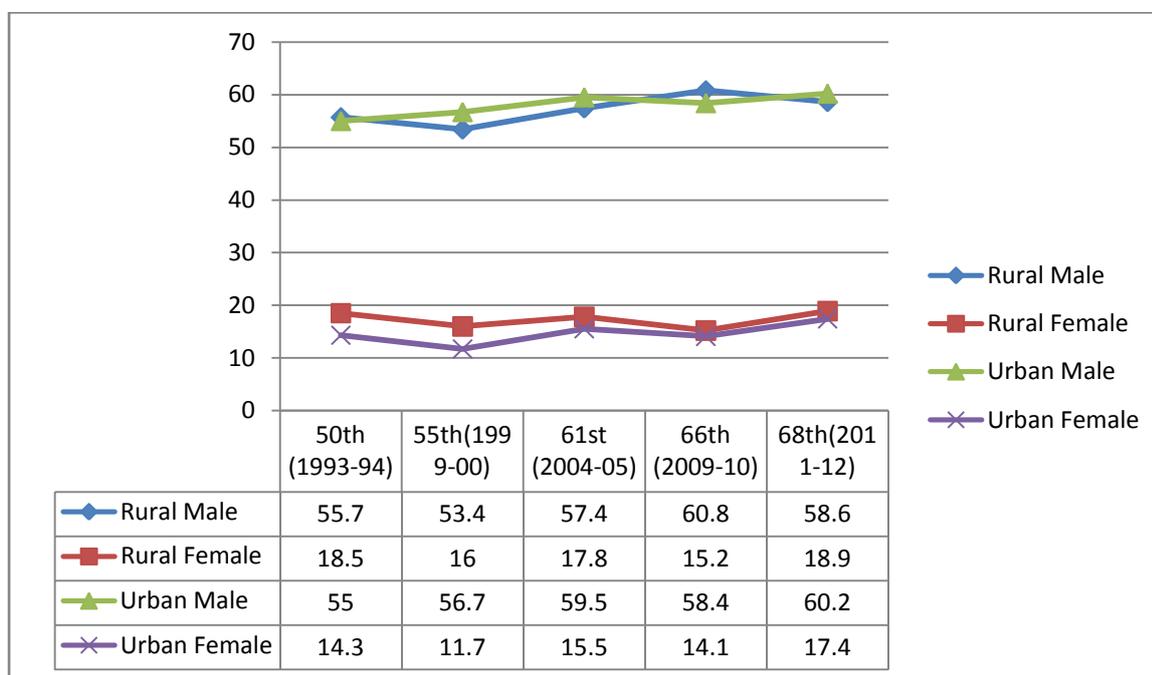


Source: GoI, 1997, 2000, 2006, 2011, 2013 (NSS 50th, 55th, 61st, 66th and 68th Rounds on Employment and Unemployment).

Figure 4.1: Trends in Work Participation Rates (WPR) according to Usual Status (ps+ss) by Sex and Residence, India, 1993-94 to 2011-12

For India while the rates for males, both rural and urban are more or less the same and do not show much variation for the period 2004-05 to 2011-12, the same cannot be said about female WPRs. The rates for females in rural areas are higher than that for urban areas indicating that more women in rural areas participate in economic activities as compared to urban areas. The picture is the same for West Bengal although the rural-urban difference in female WPRs is not as much as it is for all India. A possible explanation for the higher participation rates in the rural areas could be the higher levels of poverty in rural areas which push women into the workforce as pointed out by several studies (Bhati & Singh, 1987; Nayyar, 1987). Higher participation by women in rural areas is also explained by the fact that in the rural areas women can easily find work in family farms or household industry located close by as compared to the urban locations where work opportunities may be located at large distances from the home which restricts their work participation (Gulati, 1975). Urban

women’s work participation may also be restricted by the family structure in the urban areas where there is a lower possibility of getting assistance from older family members vis-s-vis the rural areas where the joint family system is still in prevalence (Visaria, 1983).



Source: GoI, 1997, 2000, 2006, 2011, 2013(NSS 50th, 55th, 61st, 66th and 68th Rounds on Employment and Unemployment).

Figure 4.2: Trends in Work Participation Rates (WPR) according to Usual Status (ps+ss) by Sex and Residence, West Bengal, 1993-94 to 2011-12

Figures 4.1 and 4.2 also reveal that the WPRs have declined for all groups between 1993-94 to 1999-2000 thereafter which the rates have increased during 2004-05 for all groups. This increase in employment and the WPRs in the 61st Round (2004-05) for all groups and especially for females which was largely due to expansion of unpaid labour and self employment (Mazumder and Neetha, 2011) and has been termed as “distress employment” (Himanshu, 2011) or “distress related feminization of work” (Abraham, 2009). The same trend is observed in West Bengal except for urban males which have shown an increase in WPRs during the said period. Though the rates have remained almost steady for the male workers in the subsequent periods (2009-10 and 2011-12), the rates for females, especially in rural areas have shown a sharp decline in 2009-10 which continued even in the ensuing period (2010-11), though the rates picked up for urban female workers. In West Bengal however, though the rates have declined between 2004-05 and 2009-10 for females both in rural and urban areas, the rates have picked up in the subsequent period i.e. 2011-12.

4.2.3. Employment by Status

Another important aspect of employment is the status of the workforce. According to the NSS, employment status of the workforce can be of three types-self-employed, regular and casual. Regular paid employment is generally considered secure as compared to the other two. In the self-employed category certain types of employment may be irregular, uncertain and inadequate. On the other hand, casual employment is uncertain both in terms of duration and the income level (Awasthi, 2012, p. 118). Most of the employment in this sector is in the unorganised informal sector.

Table 4.2: Percentage Distribution of Employment by Usual Status (ps+ss), India and West Bengal by Sex and Residence, 1993-94 to 2011-12

Employment Status and Year	Rural Males	Rural Females	Urban Males	Urban Females	Rural Males	Rural Females	Urban Males	Urban Females
	India				West Bengal			
Self Employed								
50 th (1993-94)	57.7	58.6	41.7	45.8	54.7	59.0	37.4	36.4
55 th (1999-00)	55.0	57.3	41.5	45.3	49.2	62.4	43.1	43.6
61 st (2004-05)	58.1	63.7	44.8	47.7	53.4	61.0	44.7	52.4
66 th (2009-10)	53.5	55.7	41.1	41.1	45.2	50.9	47.3	51.6
68 th (2011-12)	54.5	59.3	41.7	42.8	43.1	57.5	44.8	46.2
Regular Workers								
50 th (1993-94)	8.5	2.7	42.0	28.4	10.3	7.3	47.6	44.1
55 th (1999-00)	8.8	3.1	41.7	33.3	7.5	5.1	39.9	40.1
61 st (2004-05)	9.0	3.7	40.6	35.6	7.3	8.3	37.3	36.7
66 th (2009-10)	8.5	4.4	41.9	39.3	8.3	8.9	37.1	36.2
68 th (2011-12)	10.0	5.6	43.4	42.8	8.2	10.3	37.5	40.4
Casual workers								
50 th (1993-94)	33.8	38.7	16.3	25.8	35.0	33.7	15.0	19.5
55 th (1999-00)	36.2	39.6	16.8	21.4	43.3	32.5	17.0	16.3
61 st (2004-05)	32.9	32.6	14.6	16.7	39.3	30.7	17.9	10.9
66 th (2009-10)	38.0	39.9	17.0	19.6	46.4	40.3	15.6	12.1
68 th (2011-12)	35.5	35.1	14.9	14.3	48.6	32.2	17.7	13.5

Source: GoI, 1997, 2000, 2006, 2011, 2013(NSS 50th, 55th, 61st, 66th and 68th Rounds on Employment and Unemployment).

A look at the percentage distribution of employment by status into self-employed, regular and casual workers (Table 4.2) reveals a higher proportion of females in the self-employed category both for rural and urban areas. More than half of the total workers are in the self-employed category for rural females both at the all India level and for West Bengal. The fact that the increase in female WPRs in the 61st round (2004-05) was largely due to increase in self-employment is evident from Table 4.2. In the category of self-employment however,

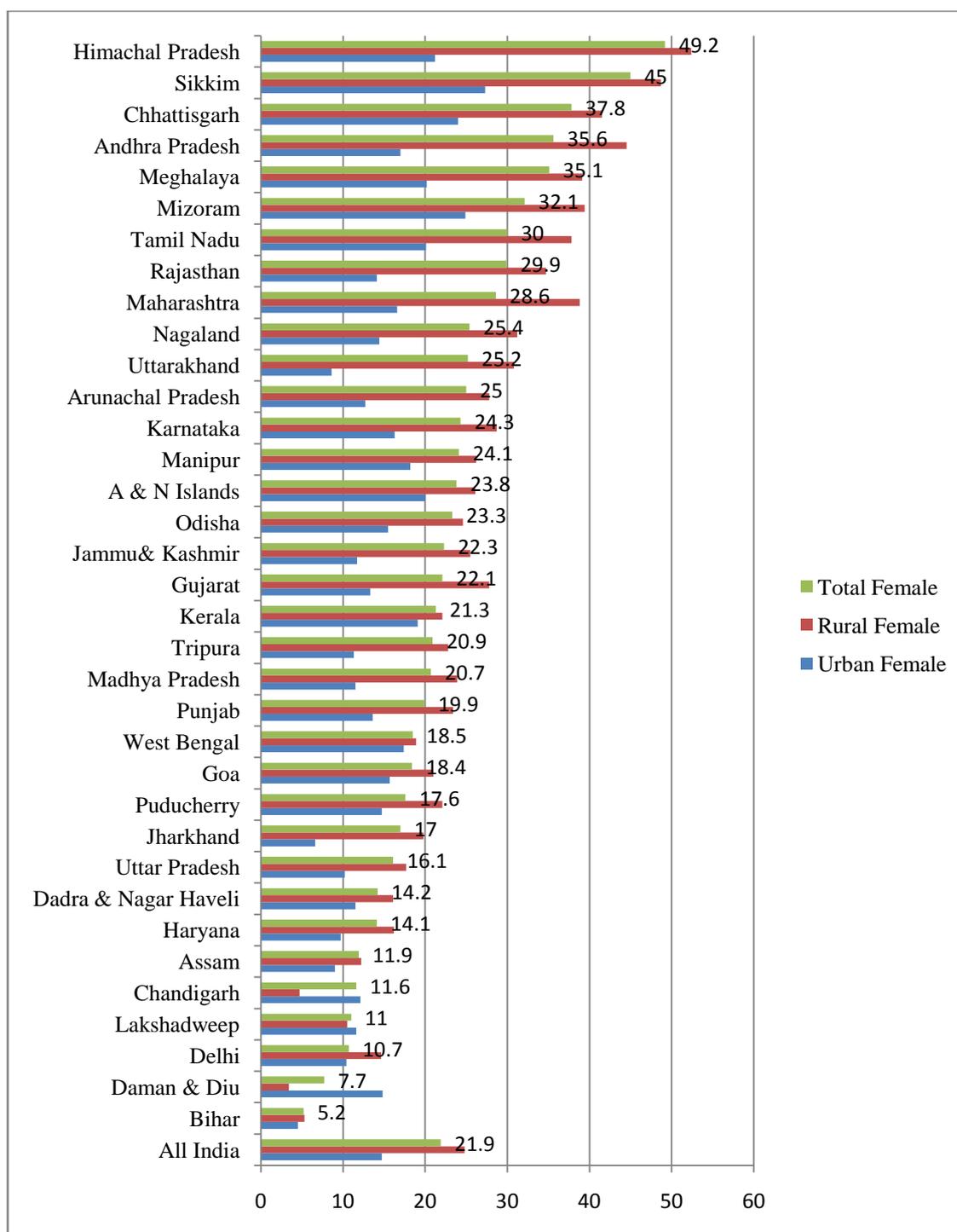
most of the jobs are in the unorganised sector which may not be adequately remunerative (Rangarajan et. al., 2011). Hence a decline in the female WPRs in this sector is desirable which occurred in the 66th Round. In the category of regular workers, which is a proxy for the organised sector, the percentage of rural females is less than the percentage of their urban counterparts and the percentages are lower for the females as compared to the males. However, an increase in the proportion of female WPRs in both rural and urban areas among regular workers is observed over the different Rounds. Among the casual workers, the reverse is true. The rates are higher for the rural females vis-a-vis the urban females and the rates for females are higher vis-a-vis the males in most of the rounds. All these point to the temporary nature of women's work, especially in rural areas which is an obvious indication of the nature and quality of their work.

4.2.4. State Wise Female Work Participation Rates

The male and female WPRs are not uniform and show wide variations across regions, states, districts and social groups (Krishnaraj and Kanchi, 2009). A state level analysis of WPRs especially female WPRs would therefore provide a better understanding of these variations. While analyzing the trends and structure of employment at the all India level most of the studies take into account only 15 major states in the country. In the present study however, all the states and Union territories have been considered to portray the true picture of the variations. The female WPRs for the different states and Union Territories according to the *usual status (ps+ss)* as per the 68th Round (2011-12) of the NSS arranged in descending order is shown in the Figure 4.3. It can be seen that the highest female WPR is observed in Himachal Pradesh (49.2 percent) and the lowest in Bihar (5.2 percent). The figure also shows the female WPRs for rural and urban areas. It can be seen that the female WPRs for the rural areas are higher than for the urban areas for all the states with the exception of the Union Territories of Chandigarh, Lakshadweep and Daman and Diu.

The states having female WPRs higher than the all India average are the northern states of Himachal Pradesh, Chattisgarh, Rajasthan, Uttarakhand and Jammu Kashmir; the western states of Gujarat and Maharashtra; the eastern state of Orissa; the north-eastern states of Sikkim, Meghalaya, Mizoram, Nagaland, Arunachal Pradesh and Manipur; the southern states of Andhra Pradesh, Tamil Nadu and Karnataka and the Union Territory of Andaman and Nicobar Islands. West Bengal occupies the 23rd rank with female WPR of 18.5 percent which is lower than the all India average of 21.9 percent.

Scholars have pointed out different factors to explain the inter-state variations in female WPRs. The inter-state variations in rural female WPRs may be attributed to dissimilar



Source: Computed from GoI, 2013 (NSS 68th Round data on Employment and Unemployment)

Figure 4.3: Worker Population Ratio (per 100) for Female Workers according to Usual status (ps+ss) for States and UTs by Residence, NSSO 68th Round (2011-12)

patterns of usage of female labour in different types of cultivation (Ghosh and Mukhopadhyay, 1984). The rice growing states show higher female WPRs as rice cultivation requires relatively more intensive use of female labour for activities like transplanting,

weeding, threshing etc., as compared to the dry land crops like wheat or millets which are irrigated and require more physical labour (Bardhan, 1974 cited in Ghosh and Mukhopadhyay, 1984; Krishnaraj and Kanchi, 2009). This may be helpful in explaining the higher female WPRs in rice growing states of Maharashtra, Orissa and the north-eastern and southern states; and the lower female WPRs in wheat growing states of Punjab and Haryana in the present analysis. However, West Bengal despite being a rice producing state shows low female WRRs which, according to Nayyar (1987) can be explained by non-economic factors. Female WPRs have also been linked inversely to household income and landlessness of the rural households in that agricultural prosperity and higher productivity agriculture induce withdrawal of female labour and greater poverty draws them into the workforce (Reddy, 1979; Nayyar, 1987). In some states socio cultural factors may lead to an under estimation of women's work despite their high involvement in productive work (Nayyar, 1987). Ghosh and Mukhopadhyay (1984) mention that in West Bengal, except among the tribals and the scheduled castes, there is an under reporting of many of the post harvest jobs which are often done exclusively by women due to "tradition bound cultural inhibitions" where social status prevents women from being considered as workers.

According to Nayyar (1987) the rural female WPRs in India are determined by economic factors such as poverty and landlessness and socio-cultural factors. Other factors like literacy, education and demographic compulsions do not affect rural female WPRs, and may be significant only at higher levels of development (*ibid*). Gulati's (1975) study however showed that the per capita income, cropping pattern, literacy, male participation rates, proportion of scheduled caste and tribe and sex ratio do not significantly influence inter-state variations in female participation rates noticeably, the reason for which she herself attributes to using aggregative data.

4.3. WORK PARTICIPATION RATE (WPR) IN DARJEELING DISTRICT- ANALYSIS OF CENSUS DATA

The concepts of work and worker have been used differently in different census years. The reference period for a person to be treated as a worker has also varied. In 1961 and 1971 Census years, the total population was classified into two mutually exclusive groups-workers and non-workers. In 1981 there were three mutually exclusive groups, i.e. main and marginal workers and non-workers. This was a major departure from the earlier Censuses. In 1981 Census anyone who has done any work at all during the last one year is a worker. The definition of work used in 1971 Census as participation in any economically productive

activity either in physical or mental remained more or less the same in 1981. The 2001 Census has defined work as participation in any economically productive activity with or without compensation, wages or profit and may be physical and/or mental in nature. It includes not only actual work but also effective supervision and direction of work along with part time help or unpaid work on farm, family enterprise or in any other economic activity. Everybody who is engaged in activities as defined above or are engaged in cultivation or milk production even solely for domestic consumption are considered as workers. Reference period for determining a person as worker and non-worker is one year preceding the date of enumeration (Census, 2001). In the 2001 Census activities for domestic consumption such as cultivation and milk production were termed as “work”. This was an improvement over the previous Censuses as it helped to capture women’s economic activities better. According to the Census main workers are those workers who worked for 6 months or 183 days or more i.e. the larger part of the reference period preceding the enumeration and marginal workers are those who worked for less than 6 months or 183 days i.e. for the smaller part of the reference period preceding the enumeration.

4.3.1. District Wise Work Participation Rates

Table 4.3 shows the Work Participation Rates for total, main and marginal workers by sex and residence for West Bengal and the different districts for 2011. West Bengal has one of the lowest female WPRs in the country (GoWB, 2004, p. 90). According to Census 2011 it ranked 25th out of 29 states for female WPRs with 18.08 per cent, lower than the all India average of 25.52 per cent. A look at the district wise WPRs reveals that the WPRs for the males are higher than that for the females for the total and main workers category as well as for the rural and urban areas. For the marginal workers too, the rates for the males are higher except for Jalpaiguri, Koch Bihar, Uttar Dinajpur, Dakshin Dinajpur, Maldah, Puruliya and Paschim Medinipur. The highest male WPR was observed in Hugli (60.88 percent) while the lowest was in Darjeeling (51.17 percent). On the other hand the district with the highest female WPR was Puruliya (31.29 percent) and the lowest female WPR was Nadia (11.48 percent). The district of Puruliya also has the highest male and female marginal WPRs as also the highest WPR for rural females. The district is a part of the Red Corridor region experiencing Naxalite-Maoist insurgency and also suffers from high levels of illiteracy, poverty and overpopulation. Poverty and the problem of insurgency may help to explain the high female WPRs in the district as females increase their participation in the labour market under economic distress or male outmigration in search of employment opportunities or due to insurgency.

While almost all the districts with the exception of Uttar Dinajpur have shown an increase in male WPRs for the period 2001-11, the same cannot be said about the female WPRs. The female WPRs have declined in several districts including the state as a whole. The districts which have registered a decline in overall female WPRs for the period 2001-11 are Jalpaiguri, Koch Bihar, Uttar and Dakshin Dinajpur, Maldah, Birbhum, Nadia, Bankura and Puruliya.

Table 4.3: WPRs for Total, Main and Marginal Workers by Sex and Residence, West Bengal and Districts, 2011

Districts	Total		Main		Marginal		Rural		Urban	
	M	F	M	F	M	F	M	F	M	F
Darjiling	51.17	22.44	42.29	15.01	8.88	7.43	50.27	26.01	52.55	16.93
Jalpaiguri	55.03	22.31	46.50	12.25	8.53	10.05	54.15	25.05	57.37	14.97
Koch Bihar	58.24	20.67	51.66	9.98	6.58	10.69	58.42	21.43	56.61	14.18
Uttar Dinajpur	51.55	18.96	44.41	9.31	7.15	9.64	51.48	19.84	52.10	12.41
Dakshin Dinajpur	58.28	24.84	49.88	12.07	8.40	12.76	58.46	25.96	57.16	18.09
Maldah	52.96	23.30	41.53	10.28	11.43	13.02	52.95	23.68	53.04	20.84
Murshidabad	54.74	17.38	45.83	10.34	8.91	7.04	55.26	14.19	52.57	30.24
Birbhum	57.50	17.64	43.87	7.43	13.63	10.20	57.69	17.93	56.17	15.65
Bardhaman	57.81	16.48	46.35	8.75	11.45	7.73	60.56	19.05	53.70	12.56
Nadia	58.56	11.48	52.95	7.59	5.61	3.89	58.37	9.37	59.07	16.88
North 24 Parganas	57.53	12.81	51.39	8.68	6.14	4.12	58.86	12.75	56.53	12.85
Hugli	60.88	16.24	51.99	9.29	8.89	6.95	62.48	17.78	58.36	13.77
Bankura	57.17	23.62	41.46	8.77	15.71	14.85	57.27	24.29	56.00	16.28
Puruliya	53.52	31.29	32.95	8.38	20.58	22.90	54.03	33.99	50.09	12.57
Haora	59.91	13.69	52.16	8.17	7.75	5.53	60.72	13.65	59.44	13.72
Kolkata	59.93	17.91	54.92	13.19	5.02	4.73	-	-	59.93	17.91
South 24 Parganas	56.46	15.24	41.90	6.39	14.56	8.85	56.10	15.53	57.53	14.41
Paschim Medinipur	58.43	25.87	41.63	8.89	16.79	16.98	58.96	27.47	54.56	14.47
Purba Medinipur	57.65	15.99	38.03	5.15	19.62	10.83	58.16	16.74	53.82	10.21
West Bengal	57.07	18.08	46.31	9.01	10.76	9.07	57.19	19.35	56.84	15.35
CV	4.94	26.12	12.68	25.06	43.60	48.02	24.93	39.80	5.02	27.39

Source: Compiled from Census of India, 1991-2011 (Census of India website-www.censusindia.gov.in).

Note: M-Male, F-Female. CV- Coefficient of Variation.

The Coefficients of Variation for the male and female WPRs indicates greater variability for the female WPRs as compared to male WPRs across the districts. This may be

attributed to the multiplicity of factors affecting female work participation rates which may be economic and non-economic as opposed to men for whom economic factors are the primary determinants of participation in economic activities. It also indicates that factors affecting female participation rates are region specific and cannot be generalised over all the districts. The focus of employment policies for women should therefore be region specific and should take into account the problems of female employment of individual districts.

4.3.2. Growth of Workforce

There has been a steady increase in the number of workers during 1991-2011 in India, West Bengal and the Darjeeling district as can be seen from Table 4.4. The number of workers in the district was 4,44,847 in 1991 and this increased to 6,83,726 in 2011. Accordingly, the number of male workers have also increased from 3,20,142 in 1991 to 4,79,586 in 2011; and the number of female workers from 1,24,705 in 1991 to 2,04,140 in 2011.

Table 4.4: Number of Total workers (main+marginal) Darjeeling district, West Bengal and India, 1991-2011

Years	Darjeeling District			West Bengal			India		
	Person	Male	Female	Person	Male	Female	Person	Male	Female
1991	444847	320142	124705	21914774	18251919	3662855	314131370	224363807	89767563
2001	569442	402970	166472	29481690	22388044	7093646	402234724	275014476	127220248
2011	683726	479586	204140	34756355	26716047	8040308	481888868	331939875	149948993

Source: Compiled from Census of India, 1991-2011 (Census of India website-www.censusindia.gov.in)

In view of the economic reforms undertaken in the country during the 1990s and 2000s and a high rate of economic growth, it is not unreasonable to expect a high growth in workforce too during the same period. However, it should be noted that the growth of the workforce is limited by the growth of the population (Venkatanarayana and Naik, 2017). It would therefore be worthwhile to make a comparison between the population growth rates and the growth rates of workers to understand the changes in the worker population ratio or the Work Participation Rates (WPR). For this, Compound Annual Growth Rates (CAG) of total population and total workforce has been used (Table 4.5).

Table 4.5 clearly shows a deceleration in the growth rate of total population and the workforce during the period 1991-2011 for the district, state and the country as a whole. The deceleration in the workforce may partly be attributed to the deceleration in population growth and partly to the fact that the younger population may be withdrawing from or delaying their entry into the workforce in pursuit of higher education (*ibid*). For the district, the growth of workforce exceeds the growth of population which implies increase in the

WPRs over the entire period for both male and female workers. For the state and the country however, the growth of population exceeds the growth of female workforce during the period 2001-2011 which indicates declining WPRs. The high growth rate of female workforce during the period 1991-2001 could be due to better enumeration of women's economic activities in the 2001 Census. It could also mean that more women may be entering the workforce as a result of certain incentives provided to them which may not be possible for men as the rates for men are already saturated (*ibid*).

Table 4.5 also reveals that the rate of growth of marginal workers is higher than the rate of growth of main workers with the exception of the state and the country for female category of workers between 2001-2011. For the district it can be observed that the main female workers category registered negative growth rate during the period 1991-2001. Though the rate of growth for the main workers picked up in the 2000s as compared to the previous decade, the rates are still low compared to the rates for the marginal category. This is an indication of the casualisation of the female work force.

Table 4.5: Compound Annual Growth Rate of Population and Workforce, Darjeeling District, West Bengal and India, 1991-2011

Census Years	Darjeeling District			West Bengal			India		
	Person	Male	Female	Person	Male	Female	Person	Male	Female
Total Population									
1991-2001	2.16	2.03	2.29	1.65	1.56	1.74	2.06	2.03	2.10
2001-2011	1.39	1.21	1.57	1.31	1.22	1.40	1.64	1.59	1.70
Total Workers									
1991-2001	2.50	2.33	2.93	3.01	2.06	6.83	2.50	2.06	3.55
2001-2011	1.85	1.76	2.06	1.66	1.78	1.26	1.82	1.90	1.66
Main Workers									
1991-2001	0.89	1.23	-0.06	1.13	0.81	3.13	0.91	0.80	1.26
2001-2011	1.07	0.99	1.32	1.10	1.07	1.28	1.48	1.30	2.06
Marginal Workers									
1991-2001	29.95	33.67	27.27	17.09	27.13	12.78	12.21	29.13	7.87
2001-2011	5.23	6.62	3.76	3.45	5.70	1.24	2.95	5.35	1.09

Source: Compiled from Census of India, 1991-2011 (Census of India website-www.censusindia.gov.in)

4.3.3. Work Participation Rates by Residence

From Table 4.6 it can be seen that the WPR for the district of Darjeeling is lower than the state average except in 1991, and the district and the state averages are both lower than that for the entire country. The WPR for total workers in the district was 37.02 percent as against 38.08 percent in the state and 39.80 per cent for the entire country according to the 2011

Census data. The rates for male and female workers in the same year were 51.17 percent and 22.44 percent respectively in the district. The corresponding figures for state were 57.07 and 18.08 percent respectively, and for the all India level they were 53.26 and 25.52 percent respectively. The female WPR in the state was only 18.08 percent in 2011 which is much below the all India average and the average for Darjeeling district. In fact the district average is better than the state average for all three census years for total and main female workers. For marginal workers, both male and female, the district average is lower than the state and the all India average.

A comparison of the WPRs for male and female workers reveals lower WPRs for female workers for total and main category of workers. The WPRs for marginal workers on the other hand reveals higher rates for females as compared to males except in 2011. This shows that there are more marginal workers among the women as compared to men, which clearly implies greater marginalisation of the female workforce though the picture may be changing since 2011.

Table 4.6: Work Participation Rates for Total, Main and Marginal Workers, Darjeeling District, West Bengal and India, 1991-2011.

Census Years	Darjeeling District			West Bengal			India		
	Person	Male	Female	Person	Male	Female	Person	Male	Female
Total Workers									
1991	34.22	47.13	20.09	32.19	51.40	11.25	37.46	51.55	22.25
2001	35.39	48.51	21.38	36.77	53.99	18.32	39.10	51.68	25.63
2011	37.02	51.17	22.44	38.08	57.07	18.08	39.80	53.26	25.52
Main Workers									
1991	33.71	46.77	19.42	30.23	50.66	7.96	34.10	50.93	15.93
2001	29.76	43.23	15.38	28.72	47.01	9.12	30.43	45.13	14.68
2011	28.85	42.29	14.57	28.14	46.31	8.56	29.94	43.83	14.34
Marginal Workers									
1991	0.51	0.35	0.68	1.96	0.74	3.29	3.36	0.62	6.32
2001	5.63	5.28	6.00	8.05	6.98	9.21	8.67	6.55	10.95
2011	8.17	8.88	7.43	9.94	10.76	9.07	9.85	9.42	10.31

Source: Compiled from Census of India, 1991-2011 (Census of India website-www.censusindia.gov.in).

It can be seen from Table 4.7 which shows the WPRs for rural and urban areas, that the WPRs for the rural female workers are higher as compared to the urban female workers. This could be explained by the fact that women in rural areas due to poverty have to work harder compared to their urban counterparts which leads to higher WPRs for rural women. For the male workers however, the urban WPRs are higher than the rural WPRs for the district

whereas the figures for the state and the country reveal higher rural WPRs for males except in 2011 where the rates for urban males are slightly higher than for rural males for India. A plausible explanation for this could be that Darjeeling district being a hill region primarily is characterised by out migration of the male workforce to the urban areas in search of better employment opportunities leaving the women folk behind. This may be substantiated by the higher rates for male main urban workers as compared to male main rural workers.

Table 4.7 Work Participation Rates for Total, Main and Marginal Workers by Sex and Residence, Darjeeling district, West Bengal and India, 1991-2011

	Darjeeling District			West Bengal			India		
	Person	Male	Female	Person	Male	Female	Person	Male	Female
Total Rural Workers									
1991	36.17	46.77	24.82	33.18	52.09	13.07	39.99	52.48	26.67
2001	37.04	47.92	25.65	37.90	54.09	20.86	41.75	52.11	30.79
2011	38.30	50.27	26.01	38.73	57.19	19.35	41.83	53.03	30.03
Rural Main Workers									
1991	35.54	46.39	23.93	30.61	51.18	8.74	35.69	51.76	18.57
2001	29.71	41.31	17.57	27.89	45.76	9.08	30.87	44.31	16.65
2011	27.62	38.71	15.79	26.52	44.03	7.75	29.49	41.63	15.84
Rural Marginal Workers									
1991	0.62	0.38	0.88	2.57	0.91	4.33	4.29	0.72	8.10
2001	7.33	6.61	8.09	10.01	8.33	11.78	10.88	7.79	14.14
2011	10.68	11.55	9.79	12.21	13.16	11.21	12.34	11.39	13.33
Total Urban Workers									
1991	29.78	47.92	8.89	29.59	49.64	6.21	30.17	48.94	9.17
2001	31.94	49.72	12.16	33.85	53.74	11.57	32.25	50.60	11.88
2011	35.05	52.55	16.93	36.69	56.84	15.35	35.31	53.76	15.44
Urban Main Workers									
1991	29.54	47.62	8.72	29.23	49.34	5.79	29.50	48.59	8.13
2001	29.87	47.14	10.66	30.84	50.15	9.21	29.29	47.19	9.42
2011	30.75	47.76	12.69	31.61	51.18	10.28	30.95	48.65	11.04
Urban Marginal Workers									
1991	0.25	0.31	0.18	0.36	0.31	0.41	0.68	0.35	1.04
2001	2.07	2.58	1.51	3.01	3.59	2.36	2.96	3.41	2.46
2011	4.30	4.79	3.80	5.08	5.66	4.46	4.36	5.11	3.56

Source: Compiled from Census of India, 1991-2011 (Census of India website-www.censusindia.gov.in).

Another distinguishing feature is the high rates for rural and urban female workers for the total and main workers category in the district as compared to the state average. The rates are even higher than the all India average for the rural female main workers category except in 2011, and for the urban female main workers. The difference between the female WPRs in the district and the state is more pronounced for the rural areas than for the urban areas. This

may be an indication of higher WPRs for rural women in the hill and mountain areas as compared to the lowland areas which has been substantiated by several studies as mentioned in the earlier chapters.

The WPRs in the district increased over the entire period 1991-2011, though the increase was more during the 2000s as compared to the decade of the 1990s. For the male workers the increase was more during the 2000s whereas for the females the increase was more during the previous decade. For the state and the country the WPRs show an increasing trend between 1991-2011 with the exception of female WPRs showing a slight decline during the period 2001-2011. The WPRs for the rural and urban areas also exhibit an increasing trend. For the state and the country however, the rural female WPRs show a marginal decline in 2011 as compared to 2001. There is a larger increase in the WPRs in the urban areas as opposed to the rural areas.

The WPRs for main workers shows a declining trend except for the state where female WPR has shown a slight increase in 2001. The decline is sharper for females as compared to the males between 1991-2001 as compared to the subsequent decade for the district. Location wise, the WPRs for the main workers in rural areas show a declining trend with the exception of West Bengal for female workers which show a slight increase during the period 1991-2001. For the urban areas, on the other hand the main WPRs show an increasing trend with the increase being more for the females.

The WPRs for marginal workers on the other hand shows an increasing trend. However, in the state and the country the marginal female WPR has shown a slight decline in 2011. Though the increase in the marginal WPRs is higher for the males as compared to the females, the rate of increase is very high for both males and females. There has been a sharp increase in marginal WPRs during the decade of the 1990s as compared to the subsequent decade. In the district during the 1990s the increase was more in the rural areas but the trend reversed in the following decade. For the state and the country too, the increase in marginal WPRs is more pronounced for the urban areas during the 2000s. This is an indication of the increasing informalisation of the urban workforce.

The declining main WPRs and the increasing marginal WPRs implies that the proportion of workers engaged as main workers are continuously decreasing whereas those engaged as marginal workers are continuously increasing indicating a trend towards marginalisation of the workforce. A comparison of main and marginal WPRs also reveals that the increase in total WPRs is due to increase in marginal WPRs since the main WPRs are showing a declining trend for male and female workers. Also the increase in marginal WPRs

in the urban areas may point to the fact that the rural populaces who migrate to the urban areas find employment in the urban informal sector as marginal workers.

4.3.4. Industrial Classification of Workers

The industrial classification of workers shows us the categorization of the country's workforce into different occupations. A study of the occupational structure is significant since the occupational structure changes with the process of economic development. Traditionally, the different occupations have been classified into three sectors- primary, secondary and tertiary. The primary sector includes agriculture and allied activities, the secondary sector includes industry and the tertiary sector includes services. In the initial stages of development there is high dependence and high concentration of the workforce in the primary sector. As national income rises and development takes place there is an occupational shift towards the secondary sector. In the later phase of development as national income rises further, there is again an occupational shift towards the tertiary sector. Thus with economic development there is a gradual shift of the working population from agricultural activities towards non-agricultural activities and from industry to services. There is however debate among scholars as to whether this shift away from agriculture can be considered as a positive structural change. Unni (1989) mentions that Vaidyanathan (n. d) and Visaria (1984) have pointed out that the ability of the agricultural sector in India to absorb labour and provide livelihood to the rural population has reached a saturation point which causes the excess labour in the rural areas to look for alternative employment in the rural non-farm sector. The shift away from agriculture thus cannot be termed as a structural change (cited in Unni, 1989). However, Sanyal (1986) has pointed out in his study that historically, the developed countries such as U.K., U.S.A., Japan, France, West Germany, Sweden and U.S.S.R. have observed a shift in the working population from primary to secondary activities in the process of their economic development.

In recent Indian Census a four-fold classification of the workforce has been adopted and workers are classified as Cultivators, Agricultural Labourers, Household Industry and Other Workers. To study the changes in the occupational structure firstly an analysis of the changes in the share of non-agricultural workforce is done followed by analysis of the industrial classification of workers in the different census years. The definition of the four categories of workers according to the Census (2011) is as mentioned below.

Cultivator: A person who is engaged in cultivation of land either owned, held from Government or from private persons or institutions for payment in money, kind or share; or is involved in supervision or direction in cultivation may be termed as a cultivator.

Agricultural Labourers: A person who is engaged on another person's land in lieu of wages which may be in money, kind or share, and has no risk in cultivation and no right of lease or contract on land is termed as an agricultural labourer.

Household Industry Workers: An industry which is carried out by one or more household members within the home or village in rural areas and only within the confines of the house where the household lives in urban areas is defined as Household Industry. Most of the workers in the household industry are members of the household and the industry is not organized on the scale of a registered factory.

Other Workers: The Other Workers (OW) category includes all those workers who are not included in the above three categories i.e. cultivators, agricultural labourers or workers in Household Industry. This category includes workers such as government employees, teachers, factory and plantation workers, those engaged in trade and commerce, business, banking, construction, political or social work, entertainment artists, priests etc.

In the 1981, 2001 and 2011 Census the workers were divided into the four industrial categories mentioned above. In the 1991 Census the main workers were divided into nine industrial categories. They were: (1) Cultivator; (2) Agricultural Labourer; (3) Livestock, Forestry, Fishing, Hunting, Plantations, Orchards and Allied activities; (4) Mining and Quarrying; (5) Manufacturing, Processing, Servicing and Repairs (a) Household Industry (b) Other than Household Industry; (6) Construction; (7) Trade and Commerce; (8) Transport, Storage and Communications and (9) Other Workers. For purpose of comparison, the categories (3), (4), (5)(b), (6), (7), (8) and (9) have been clubbed together for the 1991 Census data to obtain the workers in the Others category.

Table 4.8 shows the absolute number of different categories of workers in the district for 1991-2011. It can be seen that the number of cultivators has declined continuously since 1991 for both male and female workers. 33,453 male farmers and 22,989 female farmers in the main category moved away from self cultivation during 1991-2011. However during the same period there was an addition of 12,356 male farmers and 9,418 female farmers in the marginal category. The reasons for the shifting of the workforce from self cultivation could be the increasing costs of cultivation and the decline in profitability (Venkatanarayana and Naik, 2017).

The increase in the number of marginal cultivators however, could not offset the decline in the number of main cultivators leading to a decline in the number of total cultivators. Interestingly the number of agricultural labourers on the other hand has shown an

increase for both male and female workers during the same period. During 1991-2011 around 3,157 male and 8,644 female agricultural labourers entered the workforce.

Table 4.8: Number of Workers by Industrial Categories, Darjeeling District, 1991-2011

Categor	Total Workers			Main Workers			Marginal Workers		
	1991	2001	2011	1991	2001	2011	1991	2001	2011
Census Years									
Cultivators									
Person	11084	88194	76178	10842	68665	51984	2420	19529	24194
Male	75791	57871	54694	75085	50347	41632	706	7524	13062
Female	35055	30323	21484	33341	18318	10352	1714	12005	11132
Agricultural Labourers									
Person	54240	58350	66041	51782	31288	32087	2458	27062	33954
Male	37211	35990	40368	36571	23877	23372	640	12113	16996
Female	17029	22360	25673	15211	7411	8715	1818	14949	16958
Household Industry									
Person	2787	15852	16579	2722	10937	10517	65	4915	6062
Male	2086	9880	10667	2057	7810	7863	29	2070	2804
Female	701	5972	5912	665	3127	2654	36	2845	3258
Others									
Person	27697	40704	52492	27531	36796	43826	1656	39085	86661
Male	20505	29922	37385	20402	27707	32347	1034	22153	50383
Female	71920	10781	15107	71298	90885	11479	622	16932	36278

Source: Compiled from Census of India, 1991-2011 (Census of India website-www.censusindia.gov.in).

Though there has been a decline in the main category of agricultural labourers, those in the marginal category has shown an increase. There has thus been a reshuffling of workforce within the agricultural sector from cultivators to agricultural labourers. Subba (1985) in his study of the change in agrarian relations in the Darjeeling hills mentions that the category of agricultural labourers was not noticed till the Census of 1941. It was recorded for the first time only in 1951 and has been found to be growing steadily since 1961 and in 1971 Census assumed a prominent place even in the hill areas of Darjeeling. He further notes that this increase in the number of agricultural labourers was observed all over the country, and was the result of the non-agricultural sector's inability to absorb the agricultural population. This is true of the Darjeeling hill economy as well where scope for employment diversification outside agriculture especially development of heavy industries is not viable and no serious attempt has been made for development of small scale industries. Further, the agricultural sector itself is characterised by low employment capacity due to difficult terrain, altitude, uneconomic land holdings etc. Agricultural diversification towards cultivation of spices, medicinal plants, sericulture, floriculture etc. has also not been successful at the mass level.

Uneconomic size of the holdings due to disintegration of joint families, impact of urbanization and modernisation, migration etc. have also contributed to the growth of agricultural labourers in the Darjeeling hills (Subba, 1985, pp. 78-80).

Household industry has also shown an increase for both male and female workers during 1991-2011. However for females there has been a slight decline during 2011 for total and main category. There has however been an addition in the marginal category for both males and females. For the workers in the Others category there has been continuous addition of workers, both males and females in the main as well as marginal category.

A look at the Compound Annual Growth Rates (CAGR) for different categories of workers during 1991-2011 (Table 4.9) reveals that the growth rate of cultivators was negative for both males and females during the nineties and the 2000s. During the 2000s the female cultivators declined at rates faster than the male cultivators. The main cultivators also show a negative growth rate during both the decades though the rates declined in the 2000s albeit marginally for female main workers.

Table 4.9: Compound Annual Growth Rates of Different Categories of Workers, Darjeeling District, 1991-2011

Category	Total Workers		Main Workers		Marginal Workers	
	1991-2001	2001-2011	1991-2001	2001-2011	1991-2001	2001-2011
Census Years						
Cultivators						
Person	-2.26	-1.45	-4.47	-2.74	23.22	2.17
Male	-2.66	-0.56	-3.92	-1.88	26.7	5.67
Female	-1.44	-3.39	-5.81	-5.55	21.49	-0.75
Agricultural Labourers						
Person	0.73	1.25	-4.91	0.25	27.11	2.29
Male	-0.33	1.15	-4.17	-0.21	34.19	3.44
Female	2.76	1.39	-6.94	1.63	23.45	1.27
Household Industry						
Person	18.99	0.45	14.92	-0.39	54.12	2.12
Male	16.83	0.77	14.27	0.07	53.23	3.08
Female	23.89	-0.1	16.74	-1.63	54.8	1.36
Others						
Person	3.93	2.58	2.94	1.76	37.18	8.29
Male	3.85	2.25	3.11	1.56	35.86	8.56
Female	4.13	3.43	2.46	2.36	39.15	7.92

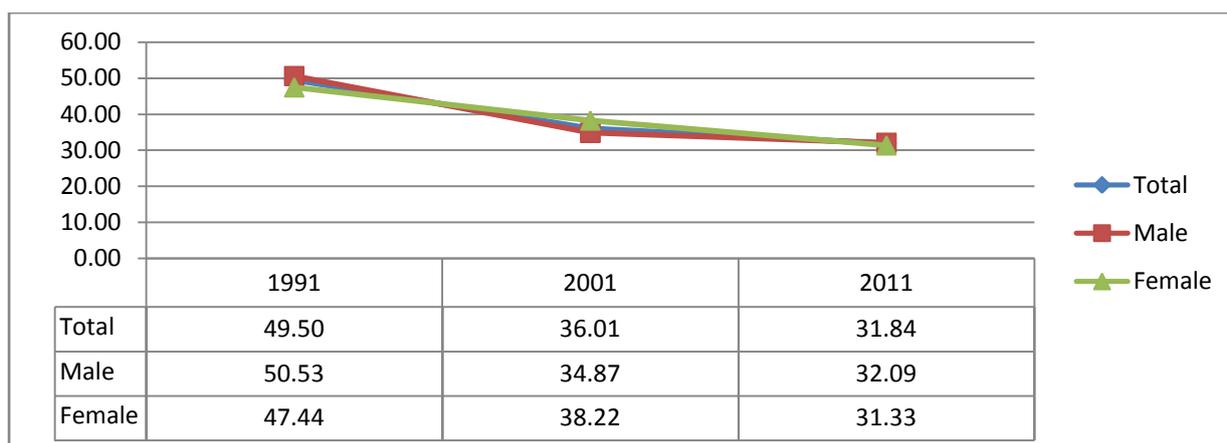
Source: Compiled from Census of India, 1991-2011 (Census of India website-www.censusindia.gov.in).

However, the marginal cultivators category reveals that the growth rate is positive for male and female workers during the nineties. The rates declined in the 2000s and were negative for females. This reveals that though there has been decline in the growth rate of main cultivators

there has been an increase in marginal cultivators for both males and females especially in the decade of the nineties.

Agricultural labourers show a negative growth rate for males during the nineties but positive growth rates for females though the rates declined in the 2000s. For males the rates were positive in the 2000s. The main workers category shows negative growth rates during the nineties which picked up in the 2000s, though the rates were still negative for males. For the marginal workers category the rates were positive and high during the nineties which declined in the next decade. On the whole, female agricultural labourers grew at rates more than male agricultural labourers during both the decades which is an indication of women's declining status in agriculture. For the household industry the rates were positive during the nineties for both males and females which declined in the next decade and were negative for females. The main and marginal categories both show positive rates during the nineties which declined in the 2000s. The rates for marginal workers are higher than for main workers and the rates for females higher than for males during the nineties. The growth rates for workers in the Others category are positive during both decades but lower in the 2000s for both males and females, with the rates for females being higher than that for males. The positive growth rates in the household industry and the Others category indicates a shift of the workforce from agriculture to non-agriculture probably due to the declining profitability of agriculture and the fact that it involves more physical labour. However, since the growth in the marginal category is manifold in contrast to growth in the main category, it causes concern regarding the quality of non-farm employment available especially in rural areas.

The declining importance of the agricultural sector in the district can be seen from Figure 4.4. The figure shows that the percentage of total workers engaged in agriculture has shown a steady decline over the period 1991-2011. In 1991 almost half the male workforce (50.53 percent) and a little less than half of the female workforce (47.44 percent) in rural areas was engaged in agricultural activities. These percentages declined over the years and in 2011 the rates were 24.37 per cent and 31.33 per cent respectively. The decline has been more prominent for the rural males. The declining rates are an indication of the declining importance of the agricultural activities in the region. This calls for intervention and policy initiatives to enquire into the causes of the shift from agriculture to non-agriculture along with suitable measures to make agriculture more remunerative by exploring the potential of the region for diversification towards non-traditional farming.



Source: Compiled from Census of India, 1991-2011 (Census of India website-www.censusindia.gov.in).

Figure 4.4: Percentage of Rural Workers in the Agricultural Sector, Darjeeling District, 1991-2011

The industrial classification of total workers as shown in Table 4.10 reveals that the highest share is of Others category of workers and the lowest share is of household industry indicating that household industry is not well developed in the region. In 1991 the share of household industry was very insignificant but in the following decade its share increased, but again declined in 2011.

Table 4.10: Percentage Distribution of Workers, Darjeeling District, 1991-2011

Category	Total Workers			Main Workers			Marginal Workers		
	1991	2001	2011	1991	2001	2011	1991	2001	2011
Census Years									
Cultivators									
Person	24.92	15.49	11.14	24.74	14.34	9.76	36.67	21.56	16.04
Male	23.67	14.36	11.40	23.63	14.02	10.50	29.31	17.15	15.69
Female	28.11	18.22	10.52	27.67	15.30	7.58	40.91	25.69	16.46
Agricultural Labourers									
Person	12.19	10.25	9.66	11.82	6.53	6.02	37.25	29.87	22.51
Male	11.62	8.93	8.42	11.51	6.65	5.90	26.57	27.62	20.42
Female	13.66	13.43	12.58	12.62	6.19	6.38	43.39	31.99	25.08
Household Industry									
Person	0.63	2.78	2.42	0.62	2.28	1.97	0.98	5.43	4.02
Male	0.65	2.45	2.22	0.65	2.17	1.98	1.20	4.72	3.37
Female	0.56	3.59	2.90	0.55	2.61	1.94	0.86	6.09	4.82
Others									
Person	62.26	71.48	76.77	62.82	76.84	82.25	25.09	43.14	57.44
Male	64.05	74.26	77.95	64.21	77.16	81.62	42.92	50.51	60.52
Female	57.67	64.77	74.00	59.16	75.90	84.09	14.84	36.23	53.65

Source: Compiled from Census of India, 1991-2011 (Census of India website-www.censusindia.gov.in).

But the share is still very small compared to the other categories of workers indicating a need to develop the same for augmenting income especially of rural households. The highest percentage of workers in the Others category is attributed to the presence of workers in plantation crops like tea, cinchona etc. The share of cultivators and agricultural labourers is showing a declining trend for both male and female workers. The share of household industry increased in 2001 followed by a decline in 2011. On the other hand the share of Others category of workers is showing an increasing trend. This clearly shows that the non-agricultural activities are gaining more importance over non-agricultural activities. It can also be seen that more women are engaged in agricultural activities i.e. as cultivators and agricultural labourers and less in the Others category. Women engaged in household industry are also higher than men except in 1991. The rates for the marginal workers are higher than for main workers for all categories except the Others workers category.

4.3.5. Age Specific Work Participation Rate

Among a total of 12,21,869 persons in the working age group i.e. 15-59 years, in the district in 2011, almost half of them were males and the other half females. However, only about 31 percent of the females chose to work as opposed to the males among whom almost 72 per cent were classified as workers. However, the female workers in this age group constituted almost 98 per cent, the highest proportion of total female workers. The age specific work participation rates for the district shows an increase in WPRs with increase in age group, the rates reaching a peak level for the 40-49 age group and declining thereafter for both males and females in rural and urban areas. For females this may be a suggestion of re-entry or late entry of a section of females who may have been pre occupied in child rearing and other household responsibilities (Reddy, 1979).

From Table 4.11 it can be seen that for the rural males there has been a decline in the WPRs for almost all age groups between 1991 and 2001 except for the age groups 30-39, 60+ and the group for which age is not stated. For the rural females there has been an increase in WPRs for the age groups 40-49, 50-59, 60+ and age not stated during 1991-2001. In the subsequent decade the WPRs in all age groups have declined for both males and females in rural areas.

The decline in the WPRs for the child workers (age groups 5-14) and the young workers (15-19) is a welcome trend since these are the school going age groups. Hence, decline in WPRs for these groups could imply increased participation in educational institutions though this needs to be substantiated by relevant data and further analysis.

Table 4.11: Age Specific Work Participation Rates by Sex and Residence, Darjeeling District, 1991-2011

Age Group	5-14	15-19	20-24	25-29	30-39	40-49	50-59	60+	ANS
Rural Males									
1991	3.79	37.09	65.98	82.43	89.81	91.37	85.49	50.80	18.00
2001	3.22	28.03	61.84	81.64	90.02	91.06	85.27	52.66	53.09
2011	2.47	23.00	57.88	80.37	89.71	90.94	83.17	45.51	51.35
Rural Females									
1991	3.26	24.17	36.13	44.08	49.59	49.34	41.50	16.51	10.12
2001	2.62	17.38	32.42	40.67	49.51	52.92	44.06	20.25	30.44
2011	1.81	11.58	26.29	38.97	48.94	50.64	42.27	17.90	27.54
Urban Males									
1991	2.55	21.09	46.89	75.63	89.42	89.86	82.86	41.11	9.59
2001	2.50	17.13	46.92	73.65	88.43	92.27	87.33	44.52	25.81
2011	2.90	17.31	48.61	76.81	89.27	92.01	86.14	39.85	45.59
Urban Females									
1991	2.28	5.55	6.93	11.93	19.05	19.30	13.01	5.74	1.54
2001	2.37	6.58	9.81	15.46	21.11	25.38	21.99	8.73	12.34
2011	2.29	6.95	14.74	23.40	28.52	30.07	26.34	10.37	18.44

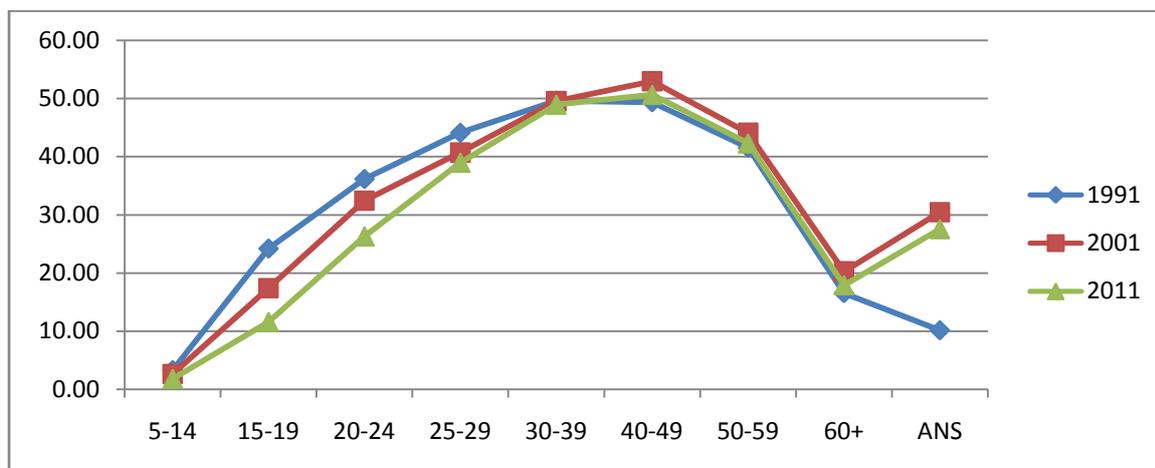
Source: Compiled from Census of India, 1991-2011 (Census of India website-www.censusindia.gov.in).

Note: ANS-Age Not Stated

Declining WPRs in rural areas for both males and females could imply decreasing employment opportunities in rural areas. For the urban males there has been a decline in WPRs for 5-14, 15-19, 25-29 and 30-39 age groups during 1991-2001. In the following decade, the WPRs for the 5-14 and 15-19 age group has increased which could again be due to decrease in population in this group. Decline in WPRs has also been observed in the 40-49, 50-59 and 60+ age groups during 2001-2011. The picture for the urban females is however different. The WPRs for all the age groups have increased during both the decades with the exception of the age group 5-14 which shows a slight decline during 2001-2011.

Higher levels of female education in the urban areas or more employment opportunities could be the reason for the increasing rates of WPRs in the urban areas. However, in view of the rising importance of the urban informal sector which provides temporary jobs with no social security it is important to consider the nature and type of employment being generated in the urban areas. The WPRs for main and marginal categories reveals that the WPRs for marginal workers in the urban areas have increased more than the WPRs for the main workers for males in both decades and during 2001-2011 for urban

females which clearly points toward the nature of employment being generated in the urban areas.



Source: Compiled from Census of India, 1991-2011 (Census of India website-www.censusindia.gov.in). Note: ANS-Age Not Stated

Figure 4.5: Age-Specific Work Participation Rates for Rural Females, Darjeeling District, 1991-2011.

From the age specific WPRs for rural females in the district as shown in Figure 4.5 it can be seen that the participation rates increase with increase in age, reaches a peak, thereafter which the rates show a decline. It can be seen that the highest participation rates have been observed for the age groups 30-39 and 40-49 years. This clearly depicts the life cycle effects of age on female WPRs wherein women of child bearing and child rearing age show lower WPRs being burdened by these responsibilities. As children grow older women may re-enter the labour market shown by higher WPRs for the age groups 30-39 and 40-49 years. In the later years of their life women may again withdraw from the labour market.

4.3.6. Education and Work Participation Rates

The relationship between female labour force participation (FLFP) and educational attainment is not a simple one. Although theoretically a positive correlation has been postulated between levels of education and FLFP, complex patterns between the two have been revealed by empirical studies in the Third World countries (Nam, 1991). Chaudhry, Khan and Abella (1987) postulate that there are two ways in which labour force participation rates may be influenced by the level of education. Firstly, higher level of education implies more time being spent in educational institutions lowering the participation rates. On the other hand the higher educational level lowers the social barriers a person has to cross which improves the prospects of securing productive jobs with higher wages. This is particularly true in the case of females, as being educated makes them equal to educated males in terms of

wage payment, and both factors taken together indicate a curvilinear relationship between participation rates and level of education (Chaudhry et.al., 1987).

Table 4.12: Work Participation Rates by Level of Education, Darjeeling District, 2001-2011

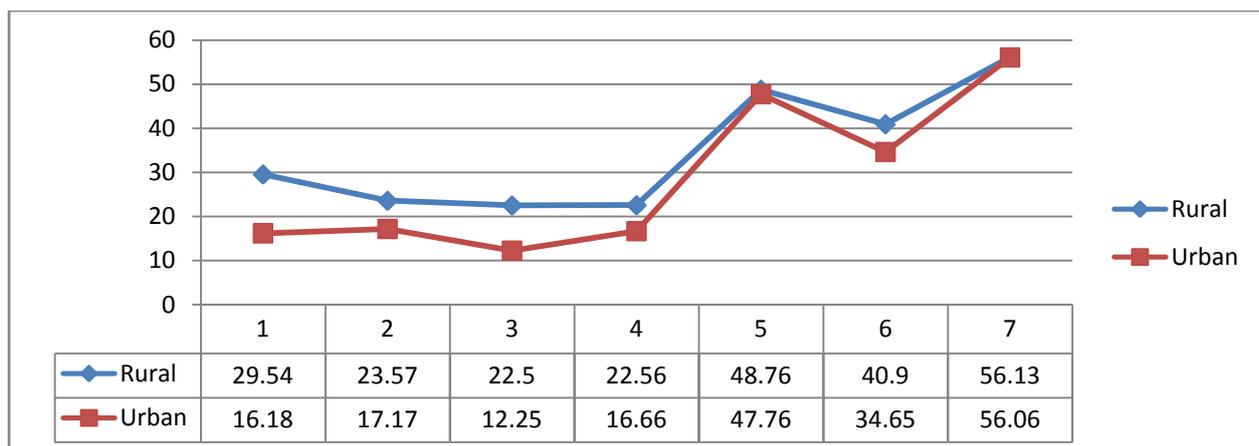
Level of Educatio	2001				2011			
	RM	RF	UM	UF	RM	RF	UM	UF
1	39.39	28.86	32.94	12.34	42.36	29.54	32.09	16.18
2	52.42	22.12	54.13	12.09	53.28	23.57	56.77	17.17
3	48.96	20.85	44.28	7.96	52.05	22.50	47.86	12.25
4	60.91	22.04	59.74	12.70	52.28	22.56	60.48	16.66
5	79.77	51.61	76.21	29.02	59.50	48.76	66.99	47.76
6	75.60	34.67	76.84	30.62	68.27	40.90	76.63	34.65
7	85.56	55.81	81.28	39.51	69.67	56.13	73.90	56.06

Source: Compiled from Census of India, 2001-2011 (Census of India website-www.censusindia.gov.in).

Note: 1-Illiterate, 2- Literate, 3-Literate but below matric/secondary,4- Matric/secondary but below graduate, 5- Technical diploma or certificate not equal to degree, 6- Graduate and above other than technical degree, 7- Technical degree or diploma equal to degree or post graduate degree. R-Rural, U-Urban, M-Male, F-Female.

As mentioned in Chapter II, certain studies postulate female education to influence female labour supply positively (Psacharopoulos, and Tzannatos 1989; Nam, 1991; Hafeez and Ahmad, 2002; Lisaniler and Bhatti, 2005) whereas others report a negative association between the two (Jehan, 2000), while still others show evidence of a non-linear, sometimes U-shaped relationship especially in developing countries (Verick, 2014). Some studies also point out to no marked relationship between the two (Gulati, 1975; Mon, 2000). Reddy (1979) points out a strong J-shaped relationship between level of education and female participation in India with higher participation rates for uneducated women in poor subsistence economies due to economic compulsion, and lower rates for women with middle or high school education. As level of education increases beyond high school, higher wages may induce better educated women to participate in the labour force.

The WPRs for the district for the years 2001 and 2011 as shown in Table 4.12 reveals that the same pattern as observed in Reddy's (1979) study can be observed with regard to female participation rates. The WPRs for the illiterate females is higher than for those with middle school education in both rural and urban areas in both the Census years.



Source: Compiled from Census of India, 2011 (Census of India website-www.censusindia.gov.in).

Note: 1-Illiterate, 2- Literate, 3-Literate but below matric/secondary,4- Matric/secondary but below graduate, 5- Technical diploma or certificate not equal to degree, 6- Graduate and above other than technical degree, 7- .Technical degree or diploma equal to degree or post graduate degree.

Figure 4.6: Female Work Participation Rates by Level of Education, Darjeeling District, 2011.

Thereafter with increase in level of education the WPRs increase reaching peak level for those with technical diploma or certificate not equal to degree, with the exception of urban females in 2001 which shows a continuous increase in WPRs with increase in level of education. The WPRs again decline for ordinary graduates but rise steeply for those with technical degree or diploma equal to degree or post-graduate degree. It can also be observed that the rural urban gap in WPRs which is high for illiterate females and those with low level of education has narrowed down for higher levels of education in 2011. For males on the other hand the WPRs increase with increase in the level of education. The relationship between female WPRs and the level of education as shown in Figure 4.6 points to a more or less J- shaped relationship with illiterates having a higher WPR in comparison to literates up to secondary level of education. The WPR then increases for those with technical education, declines for graduates and then rises for those with technical degree. Similar pattern is observed in rural and urban areas with rural rates being higher than urban rates.

4.3.7. Work Participation Rates by Marital Status

Marital status is an important factor determining the participation of women in the labour force (Mon, 2000; Lisaniler and Bhati, 2005; Chaudhary and Verick, 2014). Being married is expected to decrease the chances of women's participation in the labour market, since being married not only influences a woman's decision making ability but also increases the value of non-market activities i.e. the unpaid reproductive tasks which restrain women's

participation in the labour market (Lisaniler and Bhati, 2005). Due to the prevalence of patriarchal family structures in Indian society, married women are expected to show lower participation in labour market activities as compared to single women (Panda, 1999 cited in Chaudhary and Verick, 2014).

Table 4.13: Female Work Participation Rates by Marital Status, West Bengal and India, 1991-2001.

West Bengal										
Marital Status	Total		Main		Marginal		Rural		Urban	
	1991	2001	1991	2001	1991	2001	1991	2001	1991	2001
Never Married	4.09	6.52	3.11	3.24	0.99	3.29	4.32	6.46	3.45	6.69
Married	17.46	27.57	11.86	12.77	5.60	14.80	21.15	33.00	7.73	13.73
Widowed	16.45	24.51	12.81	16.16	3.64	8.34	17.82	26.23	12.36	20.26
Divorced/Separated	43.21	54.98	36.15	35.78	7.06	19.20	44.29	56.82	37.57	49.19
India										
Marital Status	Total		Main		Marginal		Rural		Urban	
	1991	2001	1991	2001	1991	2001	1991	2001	1991	2001
Never Married	6.72	7.52	4.92	3.66	1.81	3.86	7.89	8.64	3.46	4.55
Married	36.09	41.54	25.40	23.85	10.69	17.68	43.35	50.89	13.72	16.76
Widowed	27.03	30.70	21.44	20.65	5.59	10.05	30.08	33.69	17.21	22.73
Divorced/Separated	59.82	60.90	51.15	41.93	8.67	18.97	64.11	65.13	43.32	48.75

Source: Compiled from Census of India, 1991-2001(Census of India website-www.censusindia.gov.in).

Table 4.13 shows the female WPRs for West Bengal and India for the years 1991 and 2001. The table reveals that the highest work participation has been observed for the divorced/separated category whereas the lowest is for the never married category in both the Census years 1991 and 2001 for India and the state of West Bengal. The married category shows a higher participation rate than the widowed. Currently married women are generally supported by their spouses in comparison to the divorced/separated women who generally do not receive any maintenance and therefore show higher participation rates (Visaria, 1983). The relatively higher work participation for the widowed could be explained by the fact that most of them, especially the younger widows may not have any grown up member to look after them (*ibid*).

4.4. CONCLUSION

A discussion on labour force/work participation rates is significant as changes in the labour force participation decision has important and far reaching effects on the economy through its

influence on the size and composition of the labour force which affects growth and unemployment rates along with occupational and sex composition of the labour force. Although women, especially in rural areas are involved mostly in unpaid activities much of which is not recorded in national income data, the figures for labour force/work participation rates are nevertheless important indicators of women's participation in economic activities. Notwithstanding the various biases and limitations of labour force statistics as pointed out by several scholars, they serve as a guide in understanding the trends and patterns of women's work and the fluctuations that occur during the process of a country's structural transformation.

An analysis of the statistics on labour force participation of women according to the different NSS rounds reveals low rates of participation for women vis-a-vis men at the all India level. Not only are the rates for women low, they show a declining trend since 2004-05 more particularly in the rural areas. Such withdrawal of women from the labour force is a cause of concern and needs to be analysed carefully in view of the fact that women's participation in economic activities is a complex outcome of socio-economic and cultural factors. In the Indian context women's economic participation is responsive to economic stimuli in that their participation in the labour force tends to increase in times of economic distress. Taking into account the fact that women are burdened with domestic responsibilities they generally take up part time or casual jobs, a fact which is further reinforced by their lower levels of education and skills.

West Bengal has one of the lowest female work participation rates in the country (GoWB, 2004, p. 90), and it ranked 25th out of 29 states in 2011 for female WPRs with 18.08 percent, lower than the all India average of 25.52 percent. In West Bengal, the district of Darjeeling ranked 6th out of its nineteen districts according to the Census 2011 figures with a female WPR of 22.4 percent. Analysis of WPRs for the district reveals higher rates for rural females in comparison to those in urban areas indicating higher work burden for the rural women. An increasing trend towards casualisation of the workforce, both male and female has also been observed as marginal category workers have registered significant growth rates during the period under analysis along with increasing WPRs. Within the agricultural sector although an increase in growth of agricultural labourers accompanied by a decline in cultivators has been observed, the general trend is a shift towards non-agricultural work as revealed by the declining proportion of rural workers in agriculture. The life cycle effects of age on female WPRs is also observed from the age specific WPRs wherein women of child bearing and child rearing age show lower WPRs being burdened by these responsibilities.

The age specific WPRs were found to reach a peak during the middle age group of 30-49 years. The relationship between female WPRs and the level of education points to a more or less J- shaped relationship with illiterates having a higher WPR in comparison to literates up to secondary level of education. The WPR then increases for those with technical education, declines for graduates and then rises for those with technical degree. Similar pattern is observed in rural and urban areas with rural rates being higher than urban rates.

From the analysis it thus becomes clear that the employment in the rural areas is still largely in the agricultural sector which is by and large seasonal in nature, though a shift towards secondary and tertiary activities has been observed. Given a higher proportion of the female workforce still engaged in the primary sector in the district of Darjeeling, policy measures to improve women's status in agriculture through gender specific policy measures becomes imperative. Diversification of agriculture to make agriculture more remunerative along with developing the non-farm rural sector to increase rural employment opportunities in the region seems to be the need of the hour.

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Chapter V

Pattern of Rural Employment: Women's Work and Gender Division of Labour

5.1. INTRODUCTION

Gender division in the labour market i.e. the distribution of work between men and women is an important manifestation of gender inequalities that are prevalent in societies the world over albeit in varying intensities. This gender division of labour may be said to have evolved due to the different economic and social roles adopted by men and women and the different valuation of these roles, which may vary across different regions and cultures. While women devote a greater proportion of their time to household activities and bearing and rearing children which are termed as reproductive activities, men are more concerned with market activities with little or no role in domestic activities. In carrying out such activities women generally forgo their career. They also devote less time for development of their skills and build up of knowledge and experience which leads to women being concentrated in low paying and casual jobs. The differences between men and women in terms of investment in education, skill formation and income generating activities has its roots in the differences in the valuation of the tasks performed by men and women (Gupta and Yesudian, 2006). In patriarchal family structures, being married is expected to reduce women's opportunities for participating in economic activities (Lisaliner and Bhatti, 2005) as married women are expected to be involved more in domestic and household responsibilities. Ejaz (2011) notes that married women exhibit lower participation rates since they are more involved in providing services to the household.

The gender division of labour is primarily based on the biological division of labour in procreation and may thus be termed as 'natural' being an old pre-historical aspect of human society. But besides the biological division of labour, where only women can give birth to and nurse children, there is no other natural division of labour between men and women (D.N. and G.K., 1989). The social and household dynamics which determine the gender division of labour increases the pressure on women and the burden of unpaid work (Mehrotra and Sinha, 2017) which includes household work such as cooking, caring and nurturing of children and other members, collection of critical resources for family survival such as food and water, fuel and fodder. Much of unpaid labour is considered to be women's responsibilities. Even in cases where women are participating in paid work, there is little sharing of unpaid domestic responsibilities between men and women. As cited by Sayer

(2005) in her study, many scholars believe that although women have increasingly moved into paid work, there has not been a redistribution of household work between men and women even as this is a reflection of unequal gender relations (cited in Sayer, 2005).

The participation of women in such unpaid activities is the primary cause of invisibility of women's economic contribution. Mukherjee (1996) distinguishes between 'work' and 'employment' and points out that the term 'work' basically implies human effort which leads to production of goods and services having utility and may not necessarily help in earning income through marketability. In contrast 'employment' is normally associated with marketability, i.e. it can be traded either through barter or for money. He opines that this subtle difference between work and employment leads to conceptual ambiguities and may be the reason for inaccurate estimation of women's work (Mukherjee, 1996). The Human Development Report, 1995 (p. 97) states that since much of women's work is not valued accurately in economic terms, women are overlooked in most economic transactions notwithstanding the fact that women bear a larger proportion of the total work burden and contribute to men's paid market activities by looking after the household and children (UNDP, 1995).

The activities undertaken by women are therefore deeply influenced by the social milieu along with the perceptions regarding the type of work to be undertaken by men and women. The present chapter is intended to provide an insight into the nature and extent of women's work in the study area and to identify the gender roles in agriculture and household activities. The chapter initially delineates the socio-economic and demographic characteristics of the sampled population in the three villages along with an analysis of the labour market characteristics to have a better understanding of the nature of employment. An examination of the gender division of labour in different activities related to crop production, livestock rearing and domestic activities is also carried out to identify the gender roles in these activities in the study area. Gender differentials in time allocated to different activities in the study villages is also reported and Analysis of Variance (ANOVA) test is performed to test for any significant differences in the time spent by men and women in the different activities. Further, the gender differentials in time allocation to different activities on the basis of the farm size are also tabulated to understand the effect of size of land holding on women's and men's work. The chapter will also test some of the research hypotheses outlined in Chapter I.

5.2. METHODOLOGY

As outlined in Chapter I the following methodology is used in the present study. Multi-stage purposive and random sampling techniques have been used for selection of villages. Since the study intends to highlight the role of women in mountain farming systems, the first stage involves selection of the hill district of Darjeeling (including Kalimpong sub-division) in the state of West Bengal. The second stage involves selection of the sub-divisions. At the time of undertaking the present study Kalimpong was a sub-division of the district of Darjeeling and was accorded district status on 14th February 2017. The former district of Darjeeling comprised four sub-divisions; Darjeeling Sadar, Kurseong, Kalimpong, and Siliguri, with the first three sub-divisions being in the hill areas and the fourth in the plains. Siliguri sub-division has therefore been excluded from the present study as it lies in the plains and the study has focused on the three hill sub-divisions of Darjeeling Sadar, Kurseong and Kalimpong.

The next stage involves selection of the blocks. Among the three former hill sub-divisions of Darjeeling district, i.e. Darjeeling Sadar, Kurseong, and Kalimpong; Darjeeling Sadar and Kalimpong (now district) have three Community Development blocks each and Kurseong sub-division two Community Development blocks. One community development block each, with a higher than average proportion of agricultural workers, was chosen from Darjeeling Sadar and Kalimpong, and Kurseong block was chosen from Kurseong sub-division because of its proximity to the town. Darjeeling-Pulbazar block was chosen in the Darjeeling Sadar sub-division with 44.2 percent of agricultural workers, and Kalimpong II was chosen in Kalimpong sub-division with 61.9 percent of agricultural workers. In Kurseong sub-division Kurseong block was chosen over Mirik due to proximity from the town.

The final stage involves selection of the villages. In this stage a village with a relatively high proportion of agricultural workers was selected randomly from each block. The villages selected for the purpose of the study were Samalbong in Darjeeling-Sadar, Git Dubling Khasmahal in Kalimpong II, and Sitong Khasmahal in Kurseong. At present Darjeeling district has four sub-divisions; Darjeeling Sadar, Kurseong, Mirik, which was carved out of Kurseong sub-division on March 30th 2017, and Siliguri. Kalimpong is a separate district.

Taking 50 households from each of the three villages a sample of 150 households was selected wherein the family members participated in agricultural activities either for

commercial purposes or for subsistence. Exhaustive lists of different agricultural activities as well as activities related to animal husbandry and household activities were prepared and female respondents were interviewed and the labour inputs of the different members of the households in different activities were recorded to highlight the gender division of labour in different activities. Data regarding different socio-economic and demographic characteristics of the sample were also recorded. The male members of the household were also interviewed to obtain additional information regarding the nature of activities performed, the cropping pattern, household income, size of land etc. Besides, information was also obtained from some knowledgeable person of the village like the village headman or other educated persons.

5.3. SOCIO-DEMOGRAPHIC AND ECONOMIC CHARACTERISTICS OF THE STUDY AREA

5.3.1. Socio-demographic and Economic Characteristics vide Census, 2011

The villages chosen for the present study are primarily agrarian in character. Table 5.1 depicts the socio-demographic and economic characteristics of the sampled villages and the occupational classification as computed from the Census 2011 data. It can be seen from the table that the percentage of males and females engaged as agricultural workers in the sampled villages is higher than the district average according to the Census 2011. In Samalbong village in Sadar sub-division 42.1 percent of male workers and 58.5 percent of female workers are engaged in agriculture which makes 48 percent of the total workers dependent on agriculture. In Git Dubling Khasmahal in Kalimpong II percentage of male and female workers engaged in agriculture is 84.8 percent and 86.8 percent respectively, making 85 percent of total workers being engaged in agriculture, which is clearly higher than the percentages in Samalbong sub-division. In Sitong Khasmahal village the percentage of male agricultural workers is 81.4 percent and the percentage of female agricultural workers is 81.1 percent giving a total of 81.3 percent of agricultural workers. The data also reveals the higher participation of women in agriculture in the sampled villages except in Kurseong sub-division where the percentage is slightly lower for women. Within the agricultural workers there is a higher percentage of cultivators in comparison to agricultural labourers although in the district as a whole, more women are participating in agriculture as agricultural labourers rather than as cultivators. The distribution of agricultural workers into self-employed or cultivators and employees or agricultural labourers provides an understanding of an important dimension of employment, i.e. the status distribution of the workforce (Unni, 1989). Higher

proportion of agricultural labourers is an indication of casualisation of the female workforce. In the hills areas the usage of exchange labour popularly known as ‘*parma*’ reduces the use of agricultural labourers which could be the reason behind the higher proportion of cultivators. Household industry is poorly developed in the region with a meager 2.4 percent of workers being engaged in household industry in the district. The percentages of workers in household industry are even lower in two sampled villages with the percentages being 0.7 percent and 0.3 in Samalbong and Git Dubling Khasmahal respectively and 2.4 percent in Sitong Khasmahal. Workers in Others category constitute 76.8 percent of total workers in the district with the percentages being 51.6, 14.2 and 16.3 in Samalbong, Git Dubling Khasmahal and Sitong Khasmahal respectively.

Table 5.1: Socio-demographic and Economic Characteristics and Industrial Classification of Sampled Villages vide Census, 2011

Level	District	Sub-District	Village	Sub-District	Village	Sub-District	Village
Name	Darjeeling	Darjeeling-Pulbazar	Samalbong	Kalimpong II	Git Dubling Khasmahal	Kurseong	Sitong Khasmahal
No. of Households	391234	27470	454	13172	661	20892	605
Population (T)	1846823	126935	2077	66830	3598	94347	3098
Population (M)	937259	63828	1035	34546	1823	47030	1626
Population (F)	909564	63107	1042	32284	1775	47317	1472
Sex Ratio	970	989	1007	935	974	1006	905
Literacy Rate (T)	79.6	80.8	81.6	79.7	82.8	81.2	81.2
Literacy Rate (F)	85.6	87.6	91.7	85.6	87.7	88.6	86.0
Literacy Rate (M)	73.3	73.9	71.7	73.4	77.7	73.8	75.9
WPR (T)	37.0	41.2	39.6	37.8	39.2	36.2	36.2
WPR (M)	51.2	49.2	52.4	51.5	52.1	46.5	49.1
WPR (F)	22.4	33.2	26.9	23.0	26.0	25.9	21.9
Cultivators % (T)	11.1	32.6	29.9	42.6	60.5	10.8	76.8
Cultivators % (M)	11.4	32.9	27.9	42.7	61.3	12.3	77.1
Cultivators % (F)	10.5	32.1	33.9	42.2	58.9	8.0	76.1
Ag Lab % (T)	9.7	11.7	17.8	19.4	24.9	5.0	4.5
Ag Lab % (M)	8.4	11.0	14.2	15.9	23.5	5.3	4.3
Ag Lab % (F)	12.6	12.7	24.6	27.6	27.9	4.4	5.0
HHI % (T)	2.4	3.6	0.7	1.1	0.3	2.7	2.4
HHI % (M)	2.2	3.4	0.4	1.1	0.3	2.7	2.0
HHI % (F)	2.9	3.9	1.4	0.8	0.2	2.6	3.4
Others % (T)	76.8	52.2	51.6	37.0	14.2	81.6	16.3
Others % (M)	78.0	52.7	57.6	40.2	14.9	79.8	16.7
Others % (F)	74.0	51.4	40.0	29.4	13.0	84.9	15.5

Source: Computed from Census of India, 2011 (Census of India website: www.censusindia.gov.in)

Note: T-Total, M-Male, F-Female, WPR- Work Participation Rate, Ag Lab-Agricultural Labourers, HHI- Household Industry

5.3.2. Socio-demographic and Economic Characteristics vide Sample Survey

The sample characteristics are shown in Table 5.2. Fifty households were surveyed in each of the three villages giving a sample size of 150 households. The total population surveyed in the three villages was therefore 729 comprising 372 males and 357 females. In India, the operational holdings may be divided into five categories according to the size- marginal (below 1 hectare), small (more than 1 hectare but less than 2 hectares), semi-medium (more than 2 hectare but less than 4 hectares), medium (more than 4 hectares but less than 10 hectares) and large (10 hectares and above which includes mostly institutional holdings). In hill regions there is a preponderance of marginal holdings. In Darjeeling district the distribution of operational holdings over size-class revealed that in 2010-11, 84 percent of the holdings were marginal with average size of holding being 1.5 hectares. As such the classification used by the Agricultural Census cannot be followed in the present study. For this reason and also to maintain uniformity in categorisation of land holdings in the sampled villages, all the farms were divided into three categories-less than 1 acre (small), between 1 and 2 acres (medium) and more than 1 acre (large).

In Samalbong village, the percentage of households dependent on agriculture as a primary activity is 38 percent which is an indication of agriculture being primarily for subsistence. An important factor explaining this could be the smaller size of the land holdings in Samalbong village which is only 1.4 acres. In Samalbong village 40 percent of the households had land holdings less than 1 acre and only 28 percent of households had land holdings more than 2 acres. A large proportion (68 percent) of households had unitary structure. The larger proportion of unitary families could help explain the smaller size of the land holdings in Samalbong village since land holdings get fragmented as families divide. The average monthly income in the Samalbong village is Rs. 11,347.97 with 92 percent of households in Samalbong village having monthly income up to Rs.20, 000 (Table 5.2).

In Git Dubling Khasmahal in Kalimpong II, 70 percent of the households are dependent on agriculture as a primary activity. The average land holding is 2.8 acres with 48 percent of the households having more than 2 acres of land. Only 8 percent of households own less than 1 acre of land. The average monthly income in Git Dubling Khasmahal village is Rs 22,814.83 which is higher than that in Samalbong and Sitong Khasmahal villages. In Git Dubling Khasmahal village 78 percent of households have monthly income in the range Rs. 10,000-30,000. The male, female and total literacy levels in Git Dubling Khasmahal village are also higher than that in Samalbong village. The male literacy rate in Git Dubling Khasmahal village is however, slightly lower than that in Sitong Khasmahal village.

Table 5.2: Socio- demographic and Economic Characteristics of Sampled Villages

Village	Samalbong	Git Dubling Khasmahal	Sitong Khasmahal
No. Of Households	50	50	50
(A)Demographic Factors			
1.Population			
Males	117	127	128
Females	113	108	136
Person	230	235	264
Sex Ratio	966	850	1063
2. Age			
Mean age of men	30.7	32.6	34.1
Mean age of women	30.7	37.0	33.8
(B) Social			
1. Family Structure			
Unitary Family (Percentage)	68.0	54.0	32.0
Joint Family (Percentage)	32.0	46.0	68.0
Average Family Size	4.6	4.7	5.28
Average no. of adults	3.7	3.7	4.56
Average no. of children (0-6)	0.9	1.0	0.66
2.Literacy			
Overall Literacy	85.7	90.6	89.9
Male Literacy	88.3	94.1	95.0
Female Literacy	83.0	86.7	85.2
3. Marital Status (Percentage)			
Married (Males)	59.1	70.7	54.7
Others (Males)	40.9	29.3	45.3
Married(Females)	62.6	71.7	52.9
Others (Females)	37.4	28.3	47.1
(C)Economic factors			
1.Primary Activity of Household Head (Percentage)			
Agriculture	38.0	70.0	44.0
Non-agriculture	62.0	30.0	56.0
2.Land Holding of Households (Percentage)			
Less than 1 acre	40.0	8.0	34.0
1-2 acres	32.0	44.0	38.0
More than 2 acres	28.0	48.0	28.0
Average land holding (acres)	1.4	2.8	1.7
3. Monthly Income of Households (Rs.) (Percentage)			
less than 10000	54.0	6.0	22.0
10001-20000	38.0	40.0	54.0
20001-30000	4.0	38.0	16.0
30001-40000	4.0	14.0	6.0
40001-50000	0.0	2.0	2.0
Average monthly Income	11347.94	22814.83	15860.72

Source: Field Survey

In Sitong Khasmahal the proportion of households dependent on agriculture as a primary activity is 44 percent. The average land holding is 1.7 acres with 72 percent of households owning land upto 2 acres. The average monthly income is Rs.15,860.72 which is higher than in Samalbong village but lower than in Git Dubling Khasmahal. It can also be seen that only 8 percent of households have income above Rs. 30,000. The male and female literacy rates in the village are 95.0 and 85.2 percent respectively.

Since land is an important source of income in the rural areas, amount of land held is an indicator of the economic status of the households which may be assessed through average monthly income of the household. It can be observed from Table 5.2 that the average monthly income in Samlbong village is Rs. 11,347.94 which is lower than the average monthly income in Sitong Khasmahal and Git Dubling Khasmahal village which have an average monthly income of Rs. 15,860.72 and Rs 22,814.83 respectively. Further, whereas only 8 percent and 24 percent of households in Samalbong village and Sitong Khasmahal village respectively have average monthly income more than Rs. 20, 000, the same in Git Dubling Khasmahal village is 54 percent. It can also be seen that while Samalbong village had predominance of small holdings i.e. less than 1 acre (40 percent), Git Dubling Khasmahal village had predominance of large holdings i.e. more than 2 acres (48 percent). On the other hand Sitong Khasmahal village has more of medium holdings i.e. 1-2 acres (38 percent). Larger size of land holdings in Git Dubling Khasmahal (2.8 acres) in contrast to Samalbong and Sitong Khasmahal villages has probably led to better socio-economic status of the sampled village in Git Dubling Khasmahal as compared to the other two villages as can be seen from higher average monthly income. The small size of the land holdings in Samalbong village could be explained by the larger proportion of unitary families in the village since land holdings get fragmented as families divide. It can be seen from the table that Samalbong village has 68 percent of households which are unitary in structure, whereas in Git Dubling Khasmahal and Sitong Khasmahal village only 54 and 32 percent of households respectively are unitary in structure.

The male, female and total literacy levels in Git Dubling Khasmahal village are also higher than that in Samalbong and Sitong Khasmahal village with the exception of male literacy rate which is slightly higher in Sitong Khasmahal village. All these reveal that the socio-economic status of the sampled village in Git Dubling Khasmahal is better than that of Samalbong village and Sitong Khasmahal village.

5.4. LABOUR MARKET CHARACTERISTICS OF SAMPLED VILLAGES

5.4.1. Labour Force Characteristics

The labour force and the workforce characteristics in the sampled villages have been analysed on the basis of the *usual activity status* into three activity statuses viz. the *usual principal activity status (ps)*, *usual subsidiary activity status (ss)* and *usual activity status considering principal and subsidiary status taken together (ps+ss)* by adopting the time criteria.

The usual activity status shows the activity status of a person during the reference period of 365 days preceding the date of survey. A person is said to be employed according to the *usual principal activity status (ps)* if that person is found to be spending a relatively long time during the 365 days before the date of survey. A person who is employed according to the *usual principal status* could have participated in some economic activity for a short time, usually not less than 30 days during the reference period, simultaneously with the activity pursued as *usual principal activity status* or separately. This is termed as the *usual subsidiary activity status (ss)* of the person. The usual principal activity and usual subsidiary economic activity of a person considered together, is known as the usual activity status of the person. Individuals are termed as workers according to the *usual status (ps+ss)*, if they are engaged in some work activity either in the principal status or in the subsidiary status. Therefore, a person engaged in some economic activity for 30 days or more during the reference period may be considered as a worker according to the *usual status (ps+ss)* even though he/she may not be regarded as a worker in the *usual principal status* (GoI, 2013, NSS 68th Round).

As shown in Table 5.3, according to the *usual principal activity status (ps)*, the work participation rate (WPR) of the sample in Samalbong village is 59 percent for males and 41.6 percent for females; 59.8 percent and 52.8 percent for males and females respectively in Git Dubling Khasmahal village and 56.3 and 47.8 percent for males and females respectively in Sitong Khasmahal village, indicating higher WPRs for males as compared to the females. According to the *usual subsidiary activity status (ss)* and the *usual status (ps+ss)* however, the WPRs increase for both males and females. In fact, the increase for females exceeds the increase for males making the WPRs for females to be greater than that for males. This indicates that most women in the sampled villages participate in the labour force in subsidiary capacity and many do not consider themselves as workers according to the *usual principal activity status*. In Samalbong village however, the WPRs for males is greater than that for females according to the *usual status (ps+ss)*.

A fact worth mentioning here is that although some women may not be actively employed according to the *usual status (ps)*, they are nevertheless an important component of the labour force since most of them are employed as family labour on family farms according to the *usual subsidiary activity status (ss)*.

Table 5.3: Labour Force Characteristics of Sampled Households in Surveyed Villages

Activity Status		<i>usual status (ps)</i>			<i>usual status (ss)</i>			<i>usual status (ps+ss)</i>		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Samalbong										
Employed	No.	69	47	116	73	80	153	89	84	173
	WPR	59.0	41.6	50.4	62.4	70.8	66.5	76.1	74.0	75.2
Unemployed	No.	6	4	10	0	2	2	0	1	1
	Percent	5.1	3.5	4.4	0.0	1.8	0.9	0.0	0.9	0.4
Labour Force	No.	75	51	126	73	82	155	89	85	174
	LFPR	64.1	45.1	54.8	62.4	72.6	67.4	76.1	75.0	75.7
Non-Workers	No.	42	62	104	44	31	75	28	28	56
	Percent	35.9	54.9	45.2	37.6	27.4	32.6	23.9	25.0	24.4
Total		117	113	230	117	113	230	117	113	230
Git Dubling Khasmahal										
Employed	No.	76	57	133	81	84	165	88	88	176
	WPR	59.8	52.8	56.6	64.3	77.8	70.2	69.3	81.5	74.9
Unemployed	No.	4	5	9	1	0	1	1	0	1
	Percent	3.1	4.6	3.8	0.8	0.0	0.4	0.8	0.0	0.4
Labour Force	No.	80	62	142	82	84	166	89	88	177
	LFPR	63.0	57.4	60.4	64.6	77.8	70.6	70.1	81.5	75.3
Non-Workers	No.	47	46	93	45	24	69	38	20	58
	Percent	37.0	42.6	39.6	35.4	22.2	29.4	29.9	18.5	24.7
Total		127	108	235	127	108	235	127	108	235
Sitong Khasmahal										
Employed	No.	72	65	137	73	104	177	91	105	196
	WPR	56.3	47.8	51.9	57.0	76.5	67.0	71.1	77.2	74.2
Unemployed	No.	6	4	10	0	0	0	0	0	0
	Percent	4.7	2.9	3.8	0.0	0.0	0.0	0.0	0.0	0.0
Labour Force	No.	78	69	147	73	104	177	91	105	196
	LFPR	60.9	50.7	55.7	57.0	76.5	67.0	71.1	77.2	74.2
Non-Workers	No.	50	67	117	55	32	87	37	31	68
	Percent	39.1	49.3	44.3	43.0	23.5	33.0	28.9	22.8	25.8
Total		128	136	264	128	136	264	128	136	264

Source: Field Survey

Note: WPR-Work Participation Rate, LFPR-Labour Force Participation Rate.

A comparison between the WPRs for rural areas for the state as obtained from the different rounds of NSS data shown in Appendix A (Appendix 5.1.), and the WPRs obtained for the different villages under study as shown in Table 5.3 reveals that while the WPRs for the males according to the *usual status (ps)* are quite close to the state average, there is a huge difference in the WPRs for the females. In the villages under study the female WPRs were 41.6 percent, 52.8 percent and 47.8 percent respectively for Samalbong, Git Dubling Khasmahal and Sitong Khasmahal villages, while the state average was only 18.9 percent for the NSS, 68th Round, 2011-12. This clearly indicates high work participation of the women in the hill areas. The percentages increase even more when we consider the WPRs by *usual status (ps+ss)* for both males and females.

5.4.2. Structure of Employment

The employment structure according to different activity status in the three sampled villages as obtained from field survey is shown in Table 5.4, Table 5.5 and Table 5.6. In Samalbong village, 43.5 percent of the male workers are employed in agriculture in comparison to 72.3 percent of female workers according to the *usual status (ps)*. The percentage of self employed in agriculture is greater than agricultural labourers. On the basis of the *usual status (ss)* and the *usual status (ps+ss)* the percentages increase for both males and females. Table 5.4 reveals that the percentage of female workers in agriculture is greater than the percentage of male workers showing that agriculture is a feminine activity. Allied activities which include livestock rearing, sericulture and fish farming were not taken up as a primary activity in the region but as a secondary source of income with most of the workers participating in subsidiary capacity. The off farm jobs for the males are carpentry, driving vehicles, government jobs like the army or casual jobs in construction/MGNREGA as casual labour or overseer. For the women, the off farm jobs included running a shop in the precincts of the house selling household articles, teaching or casual labour in MGNREGA during the lean season in agriculture. Some women were involved in preparing and selling country liquor.

In Git Dubling Khasmahal village, the percentage of male and female workers in agriculture according to the *usual status (ps)* was 65.8 percent and 82.5 percent respectively (Table 5.5). The percentages increase for both males and females according to the *usual status (ss)* and *usual status (ps+ss)*. According to *usual status (ss)*, 90.1 and 94 percent of male and female workers respectively participate in agricultural activities. Allied activities include livestock rearing or keeping poultry which are taken up as subsidiary activities with women's involvement being greater than that of men. The off farm activities for males are teaching, driving vehicles, running a shop, government jobs or casual labour in

construction/MGNREGA. For females off farm jobs included running a shop, teaching and working in government office along with casual labour in public works like MGNREGA.

Table 5.4: Structure of Employment by Activity status: Samalbond

Activity Status		Male		Female		Total	
		No.	Percentage	No.	Percentage	No.	Percentage
<i>usual status (ps)</i>							
Agriculture		30	43.5	34	72.3	64	55.2
1	Self employed	19	63.3	32	94.1	51	79.7
2	Agri. Labour	11	36.7	2	5.9	13	20.3
3	Allied Activities	0	0.0	0	0.0	0	0.0
Non Agriculture		39	56.5	13	27.7	52	44.8
1	Self Employed	16	41.0	4	30.8	20	38.5
2	Regular wage/salaried	18	46.2	9	69.2	27	51.9
3	Casual	5	12.8	0	0.0	5	9.6
Total (Agriculture+ Non Agriculture)		69	100.0	47	100.0	116	100.0
<i>usual status (ss)</i>							
Agriculture		66	90.4	72	90.0	138	90.2
1	Self employed	22	33.3	27	37.5	49	35.5
2	Agri. Labour	1	1.5	0	0.0	1	0.7
3	Allied Activities	43	65.2	45	62.5	88	63.8
Non Agriculture		7	9.6	8	10.0	15	9.8
1	Self Employed	0	0.0	3	37.5	3	20.0
2	Regular wage/salaried	0	0.0	0	0.0	0	0.0
3	Casual	7	100.0	5	62.5	12	80.0
Total (Agriculture+ Non Agriculture)		73	100.0	80	100.0	153	100.0
<i>usual status (ps+ss)</i>							
Agriculture		49	55.1	71	84.5	120	69.4
1	Self employed	24	49.0	49	69.0	73	60.8
2	Agri. Labour	11	22.4	2	2.8	13	10.8
3	Allied Activities	14	28.6	20	28.2	34	28.3
Non Agriculture		40	44.9	13	15.5	53	30.6
1	Self Employed	16	40.0	4	30.8	20	37.7
2	Regular wage/salaried	18	45.0	9	69.2	27	50.9
3	Casual	6	15.0	0	0.0	6	11.3
Total (Agriculture+ Non Agriculture)		89	100.0	84	100.0	173	100.0

Source: Field Survey

Table 5.5: Structure of Employment by Activity status: Git Dubling Khasmahal

Activity Status		Male		Female		Total	
<i>usual status (ps)</i>		No.	Percentage	No.	Percentage	No.	Percentage
Agriculture		50	65.8	47	82.5	97	72.9
1	Self employed	42	84.0	47	100.0	89	91.8
2	Agri. Labour	8	16.0	0	0.0	8	8.2
3	Allied Activities	0	0.0	0	0.0	0	0.0
Non Agriculture		26	34.2	10	17.5	36	27.1
1	Self Employed	6	23.1	4	40.0	10	27.8
2	Regular wage/salaried	14	53.8	6	60.0	20	55.6
3	Casual	6	23.1	0	0.0	6	16.7
Total (Agriculture+ Non Agriculture)		76	100.0	57	100.0	133	100.0
<i>usual status (ss)</i>		No.	Percentage	No.	Percentage	No.	Percentage
Agriculture		73	90.1	79	94.0	152	92.1
1	Self employed	26	35.6	24	30.4	50	32.9
2	Agri. Labour	6	8.2	1	1.3	7	4.6
3	Allied Activities	41	56.2	54	68.4	95	62.5
Non Agriculture		8	9.9	5	6.0	13	7.9
1	Self Employed	4	50.0	0	0.0	4	30.8
2	Regular wage/salaried	0	0.0	0	0.0	0	0.0
3	Casual	4	50.0	5	100.0	9	69.2
Total (Agriculture+ Non Agriculture)		81	100.0	84	100.0	165	100.0
<i>usual status (ps+ss)</i>		No.	Percentage	No.	Percentage	No.	Percentage
Agriculture		62	70.5	78	88.6	140	79.5
1	Self employed	44	71.0	67	85.9	111	79.3
2	Agri. Labour	8	12.9	0	0.0	8	5.7
3	Allied Activities	10	16.1	11	14.1	21	15.0
Non Agriculture		26	29.5	10	11.4	36	20.5
1	Self Employed	6	23.1	4	40.0	10	27.8
2	Regular wage/salaried	14	53.8	6	60.0	20	55.6
3	Casual	6	23.1	0	0.0	6	16.7
Total (Agriculture+ Non Agriculture)		88	100.0	88	100.0	176	100.0

Source: Field Survey

Table 5.6: Structure of Employment by Activity status: Sitong Khasmahal

Activity Status		Male		Female		Total	
<i>usual status (ps)</i>		No.	Percentage	No.	Percentage	No.	Percentage
Agriculture		29	40.3	57	87.7	86	62.8
1	Self employed	28	96.6	56	98.2	84	97.7
2	Agri. Labour	1	3.4	1	1.8	2	2.3
3	Allied Activities	0	0.0	0	0.0	0	0.0
Non Agriculture		43	59.7	8	12.3	51	37.2
1	Self Employed	12	27.9	3	37.5	15	29.4
2	Regular wage/salaried	20	46.5	5	62.5	25	49.0
3	Casual	11	25.6	0	0.0	11	21.6
Total (Agriculture+ Non Agriculture)		72	100.0	65	100.0	137	100.0
<i>usual status (ss)</i>		No.	Percentage	No.	Percentage	No.	Percentage
Agriculture		63	86.3	96	92.3	159	89.8
1	Self employed	31	49.2	30	31.3	61	38.4
2	Agri. Labour	2	3.2	0	0.0	2	1.3
3	Allied Activities	30	47.6	66	68.8	96	60.4
Non Agriculture		10	13.7	8	7.7	18	10.2
1	Self Employed	0	0.0	1	12.5	1	5.6
2	Regular wage/salaried	0	0.0	0	0.0	0	0.0
3	Casual	10	100.0	7	87.5	17	94.4
Total (Agriculture+ Non Agriculture)		73	100.0	104	100.0	177	100.0
<i>usual status (ps+ss)</i>		No.	Percentage	No.	Percentage	No.	Percentage
Agriculture		49	53.8	97	92.4	146	74.5
1	Self employed	39	79.6	83	85.6	122	83.6
2	Agri. Labour	1	2.0	1	1.0	2	1.4
3	Allied Activities	9	18.4	13	13.4	22	15.1
Non Agriculture		42	46.2	8	7.6	50	25.5
1	Self Employed	12	28.6	2	25.0	14	28.0
2	Regular wage/salaried	20	47.6	6	75.0	26	52.0
3	Casual	10	23.8	0	0.0	10	20.0
Total (Agriculture+ Non Agriculture)		91	100.0	105	100.0	196	100.0

Source: Field Survey

In Sitong Khasmahal village while 40.3 percent of male workers are employed in agriculture, 87.7 percent of female women workers are engaged in agriculture according to *usual status (ps)* (Table 5.6). Among those engaged in agriculture majority are self employed i.e. cultivators and very few are agricultural labourers. The labour exchange system of 'parma' which is widespread in the area cuts down the use of hired agricultural labour considerably. Among non-agricultural activities, the majority of the workers both male and female are employed as regular wage/ salaried workers. The male non-farm workers were employed in the army, government offices, or were working in other places like Kurseong town, Delhi, Bangalore, Dubai etc. Some were engaged in carpentry, driving vehicles, teaching or petty trade such as opening a shop, tailoring etc. Women's off farm jobs included teaching, maintaining a shop, ICDS helper, government jobs etc.

Although men and women are not seen participating in allied activities which primarily include animal husbandry according to *usual status (ps)*, it can be observed from the table that 47.6 and 68.8 percent of male and female workers are engaged in such activities according to *usual status (ss)*. The Work Participation Rate in agriculture also increases according to *usual status (ss)* with the rate being 86.3 percent for males and 92.3 percent for females. Taking the *usual status (ps +ss)* it can be seen that while 53.8 percent of male workers are involved in agriculture, the corresponding figure for females is 92.4 percent which is considerably higher than that for male workers.

Children also contribute to farm activities in all the three villages. The older children in some households were involved in activities like fodder collection, feeding farm animals, marketing of milk which was taken to a nearby diary, fuel wood collection along with household activities like washing and cleaning in which older girl children were primarily involved.

5.4.3. Age-Specific Work Participation Rates

In the present section the percentage of workers in the different age groups along with the age-specific work participation rates have been calculated for all the workers according to the *usual status (ps)* (Table 5.7). The highest percentage of male workers belong to the age group 30-59 years in Samalbong while in Git Dubling Khasmahal highest percentage of male workers are in the age group 30-49 and for Sitong Khasmahal the highest percentage of male workers belong to the age group 40-49. For the females the highest percentage of workers are in the age group 30-49 in all three villages. The WPRs for the males show a steady increase with increase in age group reaching a peak in the range 30-59 years in Samalbong, 25-59 years in Git Dubling Khasmahal and 30-49 years in Sitong Khasmahal thereafter which the

WPR declines. The WPRs for females on the other hand is high for the age group 20-24 years, after which there is a decline for 25-29 year age group. The rates again pick up and reach a peak for 50-59 year age group in Samalbong. In Git Dubling Khasmahal the same pattern is followed with the highest WPR being observed in the 40-49 year age group. In Sitong Khasmahal on the other hand the data reveals a steadily increasing WPR with increase in age with the peak being reached at 40-49 years.

Table 5.7: Percentage of Workers and Age Specific Work Participation Rates in Samalbong, Git Dubling Khasmahal and Sitong Khasmahal

Age Group	Males		Female		Total	
	Percentage	WPR	Percentage	WPR	Percentage	WPR
Samalbong						
15-19	5.80	23.53	0.00	0.00	3.45	11.76
20-24	2.90	25.00	8.51	44.44	5.17	35.29
25-29	17.39	85.71	6.38	37.50	12.93	68.18
30-39	21.74	100.00	36.17	80.95	27.59	88.89
40-49	23.19	100.00	29.79	70.00	25.86	83.33
50-59	23.19	100.00	17.02	100.00	20.69	100.00
60+	5.80	57.14	2.13	12.50	4.31	33.33
Total	100.00	58.97	100.00	41.59	100.00	50.43
Git Dubling Khasmahal						
15-19	0.00	0.00	0.00	0.00	0.00	0.00
20-24	7.89	54.55	5.26	33.33	6.77	45.00
25-29	9.21	100.00	3.51	22.22	6.77	56.25
30-39	28.95	100.00	33.33	79.17	30.83	89.13
40-49	30.26	100.00	29.82	100.00	30.08	100.00
50-59	7.89	100.00	17.54	90.91	12.03	94.12
60+	15.79	70.59	10.53	33.33	13.53	51.43
total	100.00	59.84	100.00	52.78	100.00	56.60
Sitong Khasmahal						
15-19	0.00	0.00	1.54	6.67	0.73	3.13
20-24	11.11	47.06	4.62	18.75	8.03	33.33
25-29	15.28	91.67	13.85	56.25	14.60	71.43
30-39	18.06	100.00	23.08	83.33	20.44	90.32
40-49	30.56	100.00	33.85	95.65	32.12	97.78
50-59	19.44	93.33	15.38	90.91	17.52	92.31
60+	5.56	25.00	7.69	27.78	6.57	26.47
Total	100.00	56.25	100.00	47.79	100.00	51.89

Source: Field Survey

While for males high WPRs have been observed between the ages 25-59, for females high WPRs have been observed between the ages 30-59 showing a little late entry or a re-entry of women into the workforce during the middle ages. This could be explained by the fact that younger aged women, especially during the child bearing age are outside the work

force being occupied with household responsibilities and child care which reduce their WPRs. On the other hand, social norms may also restrict young women from entering the labour market to earn for their families while it may not be so for young men.

5.4.4. Work Participation Rate by Level of Education

The workers according to *usual status (ps)* have also been divided according to the level of education and the percentage of workers for each level of education and the WPRs by level of education have been calculated for the three sampled villages (Table 5.8).

Table 5.8: Percentage of Workers and Work Participation Rates by Level of Education in Samalbong, Git Dubling Khasmahal and Sitong Khasmahal

Level of Education	Males		Female		Total	
	Percentage	WPR	Percentage	WPR	Percentage	WPR
Samalbong						
Illiterate	15.94	84.62	17.02	44.44	16.38	61.29
Functionally Literate	2.90	40.00	34.04	80.00	15.52	72.00
Primary	24.64	54.84	8.51	18.18	18.10	39.62
Junior High School	23.19	57.14	14.89	53.85	19.83	56.10
Secondary	23.19	80.00	14.89	35.00	19.83	57.50
Higher Secondary	5.80	44.44	10.64	41.67	7.76	42.86
Graduate and above/ Technical	4.35	60.00	0.00	0.00	2.59	50.00
Total	100.00	62.16	100.00	44.34	100.00	53.46
Git Dubling Khasmahal						
Illiterate	1.32	8.33	7.02	21.05	3.76	16.13
Functionally Literate	2.63	33.33	14.04	80.00	7.52	62.50
Primary	23.68	50.00	15.79	50.00	20.30	50.00
Junior High School	35.53	69.23	31.58	66.67	33.83	68.18
Secondary	10.53	100.00	21.05	63.16	15.04	74.07
Higher Secondary	11.84	81.82	7.02	40.00	9.77	61.90
Graduate and above/ Technical	14.47	73.33	3.51	40.00	9.77	65.00
Total	100.00	59.84	100.00	52.78	100.00	56.60
Sitong Khasmahal						
Illiterate	2.78	10.53	16.92	35.48	9.49	26.00
Functionally Literate	5.56	66.67	10.77	58.33	8.03	61.11
Primary	19.44	66.67	26.15	58.62	22.63	62.00
Junior High School	25.00	64.29	30.77	66.67	27.74	65.52
Secondary	26.39	63.33	10.77	28.00	18.98	47.27
Higher Secondary	13.89	66.67	0.00	0.00	7.30	52.63
Graduate and above/ Technical	6.94	55.56	4.62	60.00	5.84	57.14
Total	100.00	56.25	100.00	47.79	100.00	51.89

Source: Field Survey

The educational status of the workers reveals that in Samalbong, among the male workers the highest percentage have primary school education, while among the female workers the highest percentage are only functionally literate. The WPR is highest for the illiterate and those with secondary education among males whereas among females the highest WPR is for the functionally literate followed by those with junior high school education.

In Git Dubling village, the highest percentage of male and female workers has education up to junior high school level. Among the males the WPR increases with increase in level of education and reaches the highest for those with secondary education, thereafter which it declines for higher levels of education. The WPR for females is highest for the functionally literates and shows a decline at higher levels of education.

In Sitong Khasmahal the workers with secondary education makes up the highest percentage among total male workers whereas for females the highest proportion of workers have junior secondary level of education. For male workers the WPRs do not vary much across different levels of education. For females too the WPRs do not vary much but are relatively lower for illiterate workers and those with secondary level of education.

5.5. NATURE AND EXTENT OF WOMEN'S WORK IN THE STUDY AREA

Crucial to family life is work, both paid and unpaid. Although time studies reveal that the total number of hours spent by women and men in paid and family work is almost the same (Berk, 1985; Pleck, 1985, cited in Thompson and Walker, 1989), women have been found to shift their time and investment between paid and family work more than men, for proper functioning of family life (Thompson and Walker, 1989). However, considering women's paid productive work and unpaid reproductive or domestic work it is found that women in rural areas work for longer hours in comparison to their male counterparts and are primarily engaged in household works and as such have fewer opportunities for participation in productive sectors especially in developing countries. In poor subsistence economies women are engaged primarily in agriculture where they are paid low wages, or in kinds or not paid at all since their work is largely for subsistence (Kafle, 2015).

The work patterns of men and women in rural areas reveal high involvement of women in agriculture, especially as unpaid labour on family farms despite significant variations across different regions and farming systems. If the work involved in raising livestock and poultry, fisheries, conservation of water, forestry and work related to common

property resources is also included, the contribution of women to agriculture would surpass that of men (Vepa, 2005). In recent times a trend towards feminisation of agriculture has also been observed in several countries including India. This phenomenon is caused by low profits in crop production and distress migration of men (Vepa, 2005; Kelkar, 2010) along with casualisation of work (Vepa, 2005) and increased needs to augment income (Kelkar, 2010) which according to Sujaya (2006)(cited in Kelkar, 2010) compels women to participate in agricultural jobs with less wages and which are casual in nature.

The occupational classification of the sampled villages clearly shows that the women are actively involved in agricultural and allied activities as well as participating in some non agricultural activities. Besides these, women also undertake domestic responsibilities of cooking, cleaning, looking after children etc. To understand the gender division of labour in agriculture and allied activities along with domestic and household activities in the sampled villages, a categorization of participation of the family labour has been done into three groups- “Males” if it is performed only by the male members, “Females” if performed only by the female members and “Joint” if there is no distinct division of labour in participation in that activity. The family labour may be participating in the different activities either in principal or subsidiary capacity. Children below the age of 15 years and those attending educational institutions, as well as older family members above the age of 65 who are not part of the labour/work force are not considered in the analysis (Rai and Mukherjee, 2018a).

5.5.1. Gender Division of Labour in Crop Production

The labour offered by women in the sampled villages is integral to agricultural production of the region. They work side by side with men performing most of the tasks in the field including ploughing, hoeing or digging in some cases. There are few tasks on the fields which are gender specific. The primary farm activities in the sampled villages are crop production and animal husbandry. Rearing of silk worms, fish farming, maintaining poultry, and horticulture are some of the allied activities that are undertaken by a few households to supplement their income. In Samalbong the principal crops grown are vegetables which include potatoes, squash, beans, peas, cabbage, ginger etc. along with black cardamom. In some of the households at a little lower altitude paddy, maize, pulses etc. are also cultivated. In Git Dubling, the principal crops are black cardamom, broom grass, red round chillies or ‘*dalle khorsani*’ along with potatoes and other seasonal vegetables. In Sitong Khasmahal, the principal crops are carrots, radish, broom grass, red round chillies or ‘*dalle khorsani*’, seasonal vegetables like squash, beans, ‘*rai saag*’ etc. Black cardamom is also cultivated in certain households (Rai and Mukherjee, 2018a).

Agricultural activities in the hill regions are labour intensive since the techniques are primitive with use of farm implements being limited to simple tools like hoe, shovel, axe, spade, hand fork, sickle etc. Animal husbandry is an integral part of mountain farming systems as livestock provide manure and draught power for ploughing besides supplementing farm income through sale of milk and other dairy products (Rai and Mukherjee, 2018a).

A well defined division of labour in agricultural activities is not observable in the hill areas since women participate in almost all agricultural activities, even ploughing in some cases. However, the physical activities like clearing the field and ploughing are generally a man's responsibility. Family labour is essentially used in all agricultural operations. For some activities like clearing the field, ploughing, carrying manure, building embankments, harvesting etc. agricultural labour or '*khetalas*' may be employed, as a form of exchange labour as and when required. In some farms '*khetalas*' are employed in exchange for wages to supplement family labour. A '*khetala*' may be a landowner or a landless peasant working in another person's field (Subba, 1985, p. 34). An important system of labour exchange that is prevalent in the hill regions is known as '*parma*'. The word '*parma*' means a system of direct labour exchange between two households where they work in each other's land on alternate days or so (*ibid*, p. 35) thus avoiding usage of hired labour. The system of '*parma*' was found to be prevalent particularly in Samalbong and Sitong Khasmahal areas. Hired agricultural labour both male and female may be used for some activities and on daily wage basis as and when the need arises. It is generally the people from the landless category owning very minimal or no land who offer their labour in exchange for wages (Rai and Mukherjee, 2018a).

Fourteen agricultural activities have been considered and the gender division of labour in these activities in the sampled villages is shown in the Table 5.9. The table shows the participation of family labour both males and females in different activities related to crop production for 50 households each in the sampled villages. Households where only males participated in a particular activity have been recorded in the "Males" category for that activity. Similarly, households where only females participated have been recorded in the "Females" category and households where both males and females were involved in that activity were recorded in the "Joint" category. The households where that activity was performed by hired labour were not included in the analysis. The households where that particular activity was not performed were also not included in the analysis. For example, in Sitong Khasmahal village, only 8 households were involved in seed storage. The rest of the

households purchased seeds from the market. As such the remaining 42 households were not considered for the activities seed selection and seed storing (Rai and Mukherjee, 2018a).

Table 5.9: Gender Division of Labour in Different Agricultural Activities (in Percentages)

Area	Samalbong			Git Dubling Khasmahal			Sitong Khasmahal		
	Males	Females	Joint	Males	Females	Joint	Males	Females	Joint
Clearing Land	52.3	9.1	38.6	43.5	8.7	47.8	39.5	15.8	44.7
Seed Selection	34.0	36.0	30.0	37.0	23.9	39.1	0.0	37.5	62.5
Ploughing	54.2	0.0	45.8	65.0	0.0	35.0	42.1	15.8	42.1
Sowing	18.0	18.0	64.0	8.7	10.9	80.4	0.0	32.0	68.0
Uprooting of Seedlings	14.0	68.0	18.0	0.0	58.3	41.7	0.0	63.3	36.7
Watering	22.0	36.0	42.0	51.7	17.2	31.0	21.7	23.9	54.3
Application of Manure	53.1	2.0	44.9	53.7	7.3	39.0	14.9	31.9	53.2
Weeding	18.0	26.0	56.0	10.4	37.5	52.1	0.0	61.7	38.3
Harvesting	6.0	36.0	58.0	0.0	8.2	91.8	0.0	26.0	74.0
Sun Drying	16.0	64.0	20.0	0.0	22.4	77.6	0.0	42.9	57.1
Grading and Storing	49.0	10.2	40.8	22.4	10.2	67.3	8.0	30.0	62.0
Seed Storing	28.0	44.0	28.0	8.2	32.7	59.2	0.0	37.5	62.5
Weighing	58.0	16.0	26.0	51.1	4.4	44.4	34.0	22.0	44.0
Marketing	55.3	21.3	23.4	39.6	12.5	47.9	56.0	20.0	24.0

Source: Field Survey

Little division of labour is observed in the surveyed villages in the different activities related to crop production. In Samlabong village males predominate in clearing the land for cultivation (52.3 percent) and ploughing it (54.2 percent), application of manure/fertilizer (53.1 percent), weighing (58 percent) and marketing (55.3 percent); while females predominate in seed selection (36 percent), uprooting of seedlings/transplanting (68 percent), sun drying (64 percent) and seed storing (44 percent). The activities which are done jointly are sowing (64 percent), weeding (56 percent) and harvesting (58 percent) (Rai and Mukherjee, 2018a).

In Git Dubling Khasmahal village men outweigh women in ploughing (65.0 percent), watering (51.7 percent), application of manure (53.7percent) and weighing (51.1 percent) whereas women outweigh men only in uprooting of seedlings (58.3 percent). A relatively

higher female participation can nonetheless be seen in weeding (37.5 percent), sun drying (22.4 percent) and seed storing (32.7 percent) though these activities are carried out jointly in most of the households. Activities like sowing (80.4 percent) and harvesting (91.8 percent) and post harvest operations like grading and storing (67.3 percent), seed storing (59.2 percent) and marketing (47.9percent) are done jointly in most of the households (Rai and Mukherjee, 2018a).

In Sitong Khasmahal village men have a relatively higher participation in ploughing (42.1 percent) whereas women have a higher participation in uprooting of seedlings (63.3 percent) and weeding (61.7percent). All the other activities are performed jointly in most of the households. In most of the households in the village seed storing hence seed selection was not carried out as the seeds used were purchased from the market rather than being stored (Rai and Mukherjee, 2018a).

In all the three surveyed villages it can be observed that males are found to have higher participation principally in activities requiring more physical labour like clearing the land, ploughing and weighing of agricultural produce. Despite being a male dominated activity given that it requires physical strength, ploughing may also be performed by women in small plots by using spades or hoes where use of plough is not feasible and possible; as is evident from the joint participation in ploughing in 45.8 percent of households in Samalbong village, 35 percent in Git Dubling Khasmahal village and 42.1 percent in Sitong Khasmahal village. This is in sharp contrast to agriculture in the plains where ploughing is primarily a male activity. Men also predominate in application of manure/fertiliser since it requires some knowledge and expertise (Rai and Mukherjee, 2018a).

Higher participation of women can be seen in uprooting of seedling/transplanting in case of paddy. Uprooting of seedlings requires delicate handling which can be done better by women and could help explain the higher participation of women in this activity. A relatively higher participation of women in sun drying can also be seen in both villages which could be explained by the fact that this activity can be performed along with household work (Rai and Mukherjee, 2018a).

From the data presented in Table 5.9 it can be inferred that women work alongside men and shoulder equal responsibility in almost all activities related to crop production in the sampled villages. It can also be seen that there are certain activities in Git Dubling Khasmahal and Sitong Khasmahal villages in which “Males” category is absent which implies that in those households the particular activity is performed jointly. It is also an indication of the absence of male members in the household due to out migration or

widowhood/desertion, in which case the work is performed by the female members or by employing hired labour. It can however be seen that besides ploughing there are no other activities in which “Females” only category is absent. This implies that there are very few agricultural activities in which women are not participating (Rai and Mukherjee, 2018a).

It may be mentioned here that in certain households activities such as clearing the land for cultivation, ploughing and harvesting especially in case of big cardamom are done entirely by using hired labour. The data presented in Table 5.9 pertain only to the participation of family labour (Rai and Mukherjee, 2018a).

5.5.2. Gender Division of Labour in Livestock Rearing

Rearing of farm animals particularly cows, bullocks, goats etc. is an important element of mountain farming system as farm animals provide manure, milk and draught power. Barring a few, almost all the families in the sampled villages own farm animals as they are the primary source of manure since use of chemical fertilizers in the region is minimal. Other farm animals like goats, pigs or poultry are primarily for self consumption and are used during festivals or special occasions or to be sold off to augment family income during times of distress. Sale of milk and dairy products such as ‘*paneer*’, ‘*churpi*’ (forms of cottage cheese), ‘*ghee*’ etc. are also important sources of income for most of the families in the sampled villages. Women play a very crucial role in rearing of farm animals, sometimes assisted by the children and the older members of the family.

Table 5.10 shows the differentials in participation of men and women in different activities related to rearing of farm animals (Rai and Mukherjee, 2018a).

In Samalbong village it can be seen that activities done mostly by men are cleaning shed (44 percent), collecting manure (50 percent), marketing of milk (75 percent) and purchasing of animal feed (54 percent). Other activities are performed jointly by both men and women in most houses though relatively higher participation of women are found in activities like stall feeding (30 percent) and milk extraction (26.9 percent) (Rai and Mukherjee, 2018a).

In Git Dubling Khasmahal village males are involved mostly in marketing of milk (80 percent) with all the other activities being performed jointly by both men and women. Relatively higher participation of women can be observed in stall feeding (14 percent), forage collection (20 percent), milk extraction (20 percent) and taking care of animals (32 percent) (Rai and Mukherjee, 2018a).

Table 5.10: Gender Division of Labour in Livestock Rearing in Percentages

Area	Samalbong			Git Dubling Khasmahal			Sitong Khasmahal		
	Male	Female	Joint	Male	Female	Joint	Male	Female	Joint
Stall Feeding	12.0	30.0	58.0	2.0	14.0	84.0	4.8	21.4	73.8
Forage Collection	24.0	22.0	54.0	16.0	20.0	64.0	12.5	32.5	55.0
Milk Extraction	23.1	26.9	50.0	22.0	20.0	58.0	48.7	15.4	35.9
Cleaning Shed	44.0	24.0	32.0	22.0	18.0	60.0	16.7	26.2	57.1
Taking care of Animals	32.0	24.0	44.0	10.0	32.0	58.0	19.0	31.0	50.0
Collecting Manure	50.0	15.9	34.1	22.0	18.0	60.0	17.1	26.8	56.1
Marketing of Milk	75.0	10.0	15.0	80.0	16.7	3.3	27.0	18.9	54.1
Purchasing Feed	54.0	16.0	30.0	32.0	26.0	42.0	21.4	19.0	59.5

Source: Field survey

In Sitong Khasmahal village most of the activities are performed jointly. Men's participation is however found to be higher in activities like milk extraction (48.7 percent), marketing of milk (27 percent) and purchasing feed (21.4 percent). In all other activities women's participation is relatively higher (Rai and Mukherjee, 2018a). It can again be inferred from the empirical evidence presented above that women share equal responsibility in case of tending of farm animals and in certain activities they are involved to a greater degree than the men folk (Rai and Mukherjee, 2018a).

5.5.3. Gender Division of Labour in Household Activities

Empirical evidence from several studies reveal that the responsibilities undertaken by men and women in household work and childcare are highly skewed with women bearing the greater burden. There is also a difference in the nature of men's and women's involvement in family work. Not only do women do more family work than men, but the type of work they do, when they do it, the circumstances in which they do it and how they experience family work is different from men's experiences. Within the household whereas women take up tasks which are "unrelenting, repetitive and routine", most men are engaged in tasks which are "infrequent, irregular and non-routine" (Berk, 1985 cited in Thompson and Walker, 1989). Since family work is "private, unpaid, commonplace, done by women, and mingled with love and leisure" it usually goes unnoticed and is rarely acknowledged (Daniels, 1987

cited in Thompson and Walker, 1989). Nevertheless, despite women's increased participation rates in paid work, gender segregation in household work has not reduced due to the fact that change in society regarding division of labour between men and women has been unidirectional (Choudhary and Parthasarathy, 2007) with little change in perceptions regarding women's unpaid household work (Rai and Mukherjee, 2018a).

A study on the gender differentials on participation in household activities in the sampled villages (Table 5.11) reveals extremely unequal distribution of household responsibilities. Women predominate in activities like cooking, washing and cleaning, and fetching water.

In Samalbong village there is sharing of work between men and women in fuel wood collection with the work being done jointly in 40.4 percent households. However, in 55.3 percent households fuel wood collection is done exclusively by women. Men's role is relatively higher than women only in social participation which includes participation in social or voluntary organizations and social functions like marriage, death or some religious functions in the village. In Git Dubling Khasmahal village there is some help from the men folk as washing and cleaning is done jointly in 34 percent households. Fuel collection is shared by both men and women in 64.3 percent household in spite of women's participation being relatively high. Looking after the children and the aged (51.5 percent), participation in social functions (82 percent) and purchase of household articles (44 percent) is done jointly. In Sitong Khasmahal village participation of women is higher than that of men in almost all the activities except social participation. Almost equal participation has been observed in collection of fuel wood (Rai and Mukherjee, 2018a).

Table 5.11: Gender Division of Labour in Household Activities in percentages

Area	Samalbong			Git Dubling Khasmahal			Sitong Khasmahal		
	Male	Female	Joint	Male	Female	Joint	Male	Female	Joint
Cooking	0.0	94.0	6.0	0.0	84.0	16.0	0.0	80.0	20.0
Washing and Cleaning	0.0	90.0	10.0	0.0	66.0	34.0	0.0	72.0	28.0
Fetching Water	2.4	90.5	7.1	4.0	84.0	12.0	7.9	63.2	28.9
Fuel Collection	4.3	55.3	40.4	4.8	31.0	64.3	31.3	35.4	33.3
Looking after children and aged	0.0	84.2	15.8	3.0	45.5	51.5	0.0	57.8	42.2
Social Participation	30.0	22.0	48.0	8.0	10.0	82.0	16.0	12.0	72.0
Purchasing	4.0	22.0	74.0	28.0	28.0	44.0	14.0	38.0	48.0

Source: Field survey

Though there is sharing of household tasks to a certain extent in all the three villages, household responsibilities are primarily a woman's responsibility with men helping out only occasionally. Besides these activities women also participate in paid work-full time or part time when they are engaged in certain off farm activities during the lean season. Davies and Carrier (1999) mention that an individual's contribution to household work may be influenced not only by the amount of time an individual spends in paid work, but also by the time one's spouse spends in paid work (Davies and Carrier, 1999). However, Sengupta (2016) mentions that in the Indian society when a woman participates in paid work it is usually at the cost of a reduction in her leisure time and not her unpaid working time, thus leading to a dual burden of working hours for women. Shelton and John (1999) observe that men continue to spend more time in paid work and women in housework even when there is an equal distribution of total workload. Participation in paid work consequently does not reduce the unpaid labour of women except in affluent families where unpaid domestic activities may be substituted by labour saving devices or by employing paid domestic help which is not very common in the rural households (Rai and Mukherjee, 2018a).

From the above analysis of field survey data it can be inferred that though there is sharing of farm work there is very little sharing of household work between men and women with women having to bear the burden of household work disproportionately. The work burden of women in the sampled villages is definitely larger than that of men. Gender division of labour though not very prominent in agricultural and allied activities is distinctly visible in household activities (Rai and Mukherjee, 2018a).

5.6. GENDER DIFFERENTIALS IN TIME ALLOCATION

In developing countries a sizeable portion of household production is for self consumption and little is offered for sale in the market. Further, domestic activities predominantly performed by women which include cooking, cleaning, care of household members etc. are also unpaid. Though contributing significantly to the welfare of the family and hence the economy, these activities escape enumeration in labour force and national income surveys which include only those activities which are offered in exchange for a price/wage. In this context, time use survey may be regarded as a very useful tool since such a type of survey tries to capture and measure women's unpaid work by providing detailed and comprehensive information on the time allocated by individuals to different activities either on a daily or weekly basis which is not possible in any other type of social survey (Hirway, 1999). Time

use data provide a deeper understanding of the daily life of women, the nature of their work and leisure time, their voice in household decision making along with the risks of collecting fuel wood, fodder, and water (Pandey, 1999, cited in Sidh and Basu, 2011) which serve as important guidelines in policy formulation for achieving gender equality (Hirway, 1999) (Rai and Mukherjee, 2018b).

To have a proper understanding of how women and men in the sampled villages spend their time, the time allocated to different activities by the men and women were collected and tabulated. A total of nine activities in which the men and women between the ages of 15-65 participated were considered. These included crop production; livestock rearing; household work which included cooking, washing and cleaning, looking after children and the elderly and purchasing of household articles; forage and fuel wood collection; fetching water; participation in social activities; participation in other income generating activities and personal time which included washing and bathing, eating, recreation, taking rest between work, religious activities etc. The recall method has been used for recording the time spent at various activities. The errors associated with the recall method are therefore an important limitation of the study (Rai and Mukherjee, 2018b).

One-way analysis of variance (ANOVA) was also used to test for significant differences in the time spent on various activities in the three sampled villages on the basis of gender. The data was analysed using the Statistical Package for Social Sciences (SPSS) version 23. Regarding the assumption of normality, the ANOVA test is found to be robust, but may not be so in the case of violation of the assumption of homogeneity of variance (Liu, 2015). However, for equal sample sizes ANOVA is found to be fairly robust in terms of the error rate even when the assumption of homogeneity of variance is violated (Field, 2013), where equal sample sizes may be defined as the larger group size not being more than 1.5 times the size of the smaller group. In the present study the group sizes i.e. the number of males and females aged 15-65 years in each of the sampled villages are almost equal (i.e. the ratio is not greater than 1.5). Therefore, assuming normality and homogeneity of variances the ANOVA technique has been used in the present analysis to determine whether any statistically significant differences exist between the time spent by men and women in the different activities in each of the three sampled villages. The results of the ANOVA have been presented in Table 5.13 (Rai and Mukherjee, 2018b).

Table 5.12 shows the average time allocated to different activities per day by men and women in the sampled villages along with the percentage of time devoted to each activity. While women on an average devote 14.99 hours in a day while performing different

activities, both productive and non-productive in Samalbong village, men devote only 12.87 hours for the same activities ($F(1,140) = 22.471, p = 0.000$). In Git Dubling Khasmahal village while women expend 15.46 hours, the time expended by men is 13.34 hours every day ($F(1,149) = 24.354, p = 0.000$). The corresponding figures in Sitong Khasmahal village are 14.65 hours and 13.05 hours respectively for women and men ($F(1, 171) = 10.396, p = 0.002$). The ANOVA tests as shown in table 5.13 reveal significant differences in average total time spent by men and women in all the three sampled villages. This clearly shows that women bear a greater burden than men in carrying out day to day activities. From this we can accept hypothesis (1) which says that women's work burden in hill areas is higher than that of men. The results are in conformity with the findings of Bhati and Singh (1987) which has reported very long working hours for women which is the outcome of combining household and farm work. Similar views have been expressed by Sengupta (2011) regarding higher work burden of women in her study of gender differentials in work participation in rural North Bengal using time use studies (Rai and Mukherjee, 2018b).

Table 5.12: Gender Differential in Time Allocation in the Sampled Villages

Village	Samalbong				Git Dubling Khasmahal				Sitong Khasmahal			
	Time spent in hours (Average)		Percentage of time spent		Time spent in hours (Average)		Percentage of time spent		Time spent in hours (Average)		Percentage of time spent	
	M N= 74	F N= 68	M	F	M N= 77	F N= 74	M	F	M N= 80	F N= 93	M	F
Crop Production	2.49	3.00	19.34	19.98	3.75	3.49	28.15	22.60	3.17	3.25	24.27	22.19
Livestock Rearing	1.16	1.23	9.04	8.20	1.34	1.30	10.03	8.41	1.19	1.42	9.13	9.68
Forage Collection	0.94	0.99	7.30	6.59	1.23	1.45	9.20	9.40	0.76	1.02	5.79	6.93
Household Work	0.65	4.43	5.03	29.57	0.94	4.91	7.06	31.77	0.65	3.74	4.96	25.56
Fetching Water	0.02	0.24	0.15	1.58	0.01	0.21	0.06	1.35	0.11	0.11	0.82	0.76
Fuel Collection	0.16	0.26	1.23	1.75	0.16	0.24	1.22	1.57	0.21	0.20	1.59	1.33
Social Participation	0.07	0.04	0.54	0.28	0.08	0.05	0.63	0.32	0.05	0.03	0.42	0.23
Other Income Generating Activities	3.06	1.03	23.77	6.85	1.76	0.62	13.18	4.00	2.50	0.70	19.15	4.76
Personal Time	4.32	3.78	33.59	25.20	4.06	3.18	30.47	20.60	4.42	4.18	33.85	28.56
Total	12.87	14.99	100.00	100.00	13.34	15.46	100.00	100.00	13.05	14.65	100.00	100.00

Source: Field Survey

In terms of time spent per day, women in Samalbong and Sitong Khasmahal villages expend more time in crop production whereas in Git Dubling Khasmahal village the opposite is true. Git Dubling Khasmahal village being primarily agricultural with 70 percent of the households dependent on agriculture as a primary occupation, male involvement in agriculture in terms of time spent is marginally higher. In livestock rearing too the time allocated by women is higher than that by men in Samalbong and Sitong Khasmahal villages, whereas in Git Dubling Khasmahal village the time spent by men is slightly higher than time spent by women. However, the time spent by men and women in crop production and livestock rearing was not found to be statistically significantly different for all three villages (Table 5.13) (Rai and Mukherjee, 2018b).

Although the time devoted by women to crop production is higher than that of men in two study villages, ANOVA analysis shows statistically non significant differences in time allocation between men and women to crop production. The ANOVA analysis also shows statistically non significant differences in the time spent by men and women in livestock rearing although the time devoted to such activities is higher for women in two study villages. The study therefore partially accepts the hypothesis (2) that the labour input of women is higher than that of men in agricultural activities (Rai and Mukherjee, 2018b).

Table 5.13: Results of Analysis of Variance for Time Spent by Men and Women in the Sampled Villages

Activity	Samalbong		Git Dubling Khasmahal		Sitong Khasmahal	
	F-statistic	sig.	F-statistic	sig.	F-statistic	sig.
Crop Production	1.890	0.171	1.023	0.313	0.077	0.782
Livestock Rearing	0.198	0.657	0.161	0.689	2.611	0.108
Forage Collection	0.142	0.707	3.621	0.059	5.548	0.020
Household Work	394.396	0.000	650.344	0.000	328.472	0.000
Fetching Water	52.264	0.000	45.683	0.000	0.029	0.866
Fuel Collection	11.512	0.001	8.280	0.005	0.192	0.662
Social Participation	20.830	0.000	39.305	0.000	20.896	0.000
Other Income Generating Activities	44.400	0.000	22.538	0.000	59.748	0.000
Personal Time	14.091	0.000	26.220	0.000	2.441	0.120
Total Time	22.471	0.000	24.354	0.000	10.396	0.002

In other activities like forage collection, household work which includes cooking, cleaning etc., collection of fuel wood and water women spent more time than men in Samalbong and Git Dubling Khasmahal villages. Statistically significant differences in the time spent by men and women were found in collection of fuel wood and water, and household work in both the villages as can be seen from the results of the ANOVA. In Sitong Khasmahal village the time devoted to fetching water was equivalent for men and women and the time devoted to collection of fuel wood was slightly lower for women, while the time devoted to forage collection and household work were found to be greater for women. Activities such as collection of fuel wood, water, forage etc. adds to women's labour as they need to travel long distances especially in recent times due to depletion of forest and water resources. ANOVA tests reveal statistically significant differences in the time spent by men and women for forage collection and household work (Table 5.13). From this we can accept the hypothesis (3) that the labour input of women is higher than that of men in domestic activities (Rai and Mukherjee, 2018b).

In other activities i.e. social participation, other income generating activities and personal time the time devoted by men is higher than the time devoted by women in all the villages and found to be statistically significant except for personal time in Sitong Khasmahal village which was not statistically significant. However no statistically significant differences were observed in the total average time devoted by women to various activities in a day ($F(2, 232) = 1.514, p=0.222$) in the three study villages implying a similar pattern of work load of women across all three villages (Rai and Mukherjee, 2018b).

The distribution of total time devoted to different activities each day reveals that maximum time i.e. 29.57 percent in Samalbong village and 31.77 percent in Git Dubling Khasmahal village were spent by women in household activities, followed by personal time. In Sitong Khasmahal village women were found to be devoting maximum time to personal activities (28.56 percent) followed by household work (25.56 percent). Crop production and livestock raising were the other two activities in which women spent a considerable proportion of their time. In Samalbong village crop production accounted for 19.98 percent while livestock rearing accounted for 8.20 percent of women's time. In Git Dubling Khasmahal village crop production and livestock rearing accounted for 22.60 percent and 8.41 percent respectively of women's time. In Sitong Khasmahal village women devoted 22.19 and 9.68 percent of their daily time to crop production and livestock rearing respectively. While 6.85 percent of women's time in Samalbong village was devoted to other income generating activities, only 4 percent in Git Dubling Khasmahal village and 4.76

percent in Sitong Khasmahal village of women's time was devoted to such activities. Smaller landholdings in Samalbong village may have caused women to look for options outside agriculture to supplement family income during the lean season. In Git Dubling Khasmahal and Sitong Khasmahal villages however, larger landholdings mean that women find some work or the other on the family farm itself reducing women's involvement in paid work outside agriculture. It may be recalled that the average land holding in Samalbong is 1.4 acres as compared to 2.8 acres in Git Dubling village and 1.7 acres in Sitong Khasmahal village (Rai and Mukherjee, 2018b).

For the men on the other hand, the table reveals maximum time expended on personal activities. In Samalbong 33.59 percent of total time is devoted to personal and leisure activities, followed by 23.77 percent in other income generating activities, 19.34 percent in crop production, and 9.04 in livestock rearing. In Git Dubling Khasmahal 30.47 percent of men's total time is spent in personal and leisure activities followed by 28.15 percent in crop production, 13.18 percent in other income generating activities and 10.03 percent in livestock rearing. Similarly in Sitong Khasmahal men spend maximum time in personal and leisure activities i.e. 33.85 percent followed by 24.27 percent in crop production, 19.15 percent in other income generating activities and 9.13 percent in livestock rearing. Participation in household activities constitutes a relatively smaller proportion of men's daily time allocation. Men in Samalbong village spend relatively greater proportion of their time in remunerative jobs outside agriculture in comparison to the men in Git Dubling Khasmahal and Sitong Khasmahal villages who spend more time in agricultural activities. Size of the land holding which restricts opportunities for employment in agriculture could again be cited as a possible cause of this phenomenon (Rai and Mukherjee, 2018b).

It can be seen that although men and women both shoulder almost identical responsibilities in the different spheres related to crop production and livestock rearing including collection of fodder, they nevertheless bear a disproportionate burden of domestic activities along with collection of water and fuel wood. The time commitments of women to tasks such as those mentioned above leave little time for them to participate in other income generating activities or fulfill social commitments. It also means that women have little time for leisure activities (Rai and Mukherjee, 2018b).

The observations of the study are in conformity with findings reiterated in literature that women's activities are confined to the vicinity of the household i.e. the private while men's activities extend outside the household, more specifically the market.

5.7. GENDER DIFFERENTIALS IN TIME ALLOCATION BY SIZE CLASS

In agricultural families in rural areas land is an important asset and an important determinant of the socio-economic status of the households. Besides determining social status and political power in the village, the quantum of land also “structures relationships both within and outside the household” (Agarwal, 1994, p.2). The size of the land holding is also an important determinant of women’s labour force participation in the rural areas. There are several micro studies that have established a negative correlation between landlessness and female participation rates (Nayyar, 1987). Nayyar argues that in rural India, women belonging to landless families or having marginal and small farms show higher participation to fulfill their family needs since landlessness is often equated with poverty. Families who are landless also show higher dependence on non-agricultural activities, with the dependence declining in case of families with larger land holdings (Awasthi, 2012, p.198) (Rai and Mukherjee, 2018b).

Within the agricultural sector, there are several studies which point to a positive correlation between women’s participation in agriculture and size of the holdings. In technologically most advanced and considered the ‘richest regions’ of Haryana, there is an increasing involvement of family females with agriculture as the operated holding increases in size with the females from 5-10 acre holdings putting in a lower percentage of work than those from 10 to 15 acres or 15 acres and above. In the lowest acreage group i.e. 0 - 2.5 in the richest region of Haryana, the agricultural wages are much more remunerative and women’s labour becomes surplus in their own uneconomic holding, so the contribution of family females remains nil (Chowdhry, 1993). Bhati and Singh’s (1987) study of women’s contributions in agriculture in hill regions of north-west India and Thakur’s (1991) study of female farm workers in Himachal Pradesh corroborate the positive relation between the size of the holdings and the work load of the farm women. The argument put forward for this is that on larger land holdings the female workers need to put in more time in crop production activities, and due to larger size of holdings can also afford to keep more cattle which further increases their time utilization in livestock raising activities (Thakur, 1991) (Rai and Mukherjee, 2018b).

On the other hand certain studies have observed low participation in agriculture for women belonging to large farms, mainly due to higher socio economic status which prevents women from carrying out agricultural work (Usharani, Vyas and Jodha, 1993; Sadangi, Mishra, Patel, 1996; Rekha, 2012). Usharani, Vyas and Jodha’s (1993) study in semi-arid

regions of Rajasthan shows that there was a negative relation between the days of female labour use and the size of the holdings (barring medium size farms) which implies that women from well-to-do families showed relatively less participation in agriculture. Their participation rate ranged from 53.17 percent on large farms to 64.11 percent on marginal farms. Rekha's (2012) study regarding women's involvement in dry land and irrigated agriculture in Davangere district of Karnataka also concluded that while landless women bore a heavier burden of workload working as hired labourers throughout the year, women from small farms undertook more workload in agriculture and women from large farms had low participation in agricultural activities due to their high economic status.

The positive relation between size of land and women's participation in agriculture may be considered to be an important characteristic of hill agriculture. The average size of the landholding in hill areas is generally found to be less than that in the plains. Moreover, even in case of relatively larger land holdings all of it may not be fit for cultivation due to steepness of the land or unfavourable aspect. Since use of hired labour is not very common in the hill areas and most of the work is done by family labour, the positive relation between women's increased participation and the size of the land holding may hold as women put in more intensive labour in large land holdings. In the plains, the relatively large land holdings require labour inputs from hired workers since it would not be possible to carry out cultivation only with family labour which may reduce women's participation in agriculture with increase in size of land.

Since the size of the land holding has an important effect on the labour inputs in rural areas, the gender differentials in time allocation to different activities can be studied on the basis of the farm size. As mentioned earlier, all the farms in the sampled villages were divided into three categories-less than 1 acre (small), between 1 and 2 acres (medium) and more than 1 acre (large). While Samalbong village had predominance of small holdings i.e. less than 1 acre (40 percent), Git Dubling Khasmahal village had predominance of large holdings i.e. more than 2 acres (48 percent). On the other hand Sitong Khasmahal village has more of the second category of holdings i.e. 1-2 acres (38 percent). Table 5.14 shows the gender differentials in time allocation to different activities in the three villages for different size class of holdings.

An analysis of variance and a *post hoc test* (where the ANOVA test revealed a statistically significant *F*-statistic or *Brown – Forsythe – statistic*¹) was carried out to test for significant differences in the time spent by women in the different activities in the sampled villages according to the size of holdings. In the present study with increase in size

of the holdings an increase in time spent by women on crop production has been observed in the sampled villages. Statistically significant differences in crop production on the basis of size class of land holding was observed only in Git Dubling Khasmahal village (*Brown-Forsythe-statistic* = 58.927, $p=0.001$). Games Howell *post hoc* ² test was conducted due to difference in sample size and heterogeneity of variances to see which of the groups were statistically significantly different. The test revealed statistically significant difference between all three pairs of holdings: small and medium holding (Games Howell $p = 0.010$); small and large (Games Howell $p = 0.000$) and medium and large (Games Howell $p = 0.047$). In Samalbong and Sitong Khasmahal village the differences were not statistically significant (Rai and Mukherjee, 2018b).

In Samalbong village statistically significant differences were not observed in any other activity. In Git Dubling Khasmahal village, besides crop production statistically significant difference was observed in livestock rearing (*F*-statistic = 4.311, $p=0.017$) between medium and large holdings (Games Howell $p = 0.014$) and for total time per day (*F*-statistic = 7.951, $p=0.001$) between medium and large holdings (Games Howell $p = 0.001$). In Sitong Khasmahal village statistically significant difference was observed in forage collection (*Brown-Forsythe-statistic* = 81.926, $p=0.011$) with significant difference between small and large holdings (Games Howell $p = 0.011$); fuel collection (*Brown-Forsythe-statistic* = 88.986, $p=0.036$) with significant difference between small and large holdings (Games Howell $p = 0.026$) (Rai and Mukherjee, 2018b). Detailed tables of ANOVA and *post hoc* test have been shown in Appendix A.

In terms of time spent in other income generating activities which may include petty trade, regular wage/ salaried job or casual or part time work outside family farms it can be seen that the amount of time spent in such activities is higher for smaller farms in Sitong Khasmahal and Git Dubling Khasmahal but is not so in Samalbong village. In rural areas the size of the land holding is taken as a proxy for the economic status of the household since households with larger landholdings may be more affluent than the ones with smaller landholdings. This would then imply that households with smaller land holdings would be more involved in off-farm activities since land cannot provide adequate income. This is plausible in rural areas where land is a primary asset and people from landless families are compelled to search for livelihoods outside agriculture, irrespective of the level of income or wages (Awasthi, 2012, p. 198) (Rai and Mukherjee, 2018b).

Table 5.14: Gender Differential in Time Allocation in the Sampled Villages by Size Class

Samalbong						
Size Class	Less than 1 Acre		1-2 Acres		More than 2 Acres	
Activity	Male	Female	Male	Female	Male	Female
Crop Production	2.20	2.36	2.78	3.07	2.57	3.98
Livestock Rearing	1.00	0.98	1.24	1.39	1.30	1.42
Forage Collection	0.89	0.89	1.00	1.00	0.94	1.14
Household Work	0.71	4.53	0.54	4.46	0.67	4.22
Fetching Water	0.00	0.24	0.00	0.23	0.06	0.24
Fuel Collection	0.18	0.26	0.14	0.31	0.14	0.20
Social Participation	0.07	0.04	0.07	0.05	0.07	0.03
Other Income Generating Activities	2.77	0.95	3.26	0.88	3.23	1.37
Personal Time	4.37	3.89	4.19	3.93	4.39	3.36
Total	12.20	14.15	13.23	15.32	13.37	15.96
Git Dubling Khasmahal						
Crop Production	3.16	2.18	3.06	3.08	5.33	3.99
Livestock Rearing	0.98	1.39	1.23	1.04	1.72	1.52
Forage Collection	1.04	0.84	1.08	1.40	1.58	1.58
Household Work	0.68	4.98	0.90	4.82	1.16	4.96
Fetching Water	0.00	0.36	0.01	0.18	0.01	0.19
Fuel Collection	0.21	0.39	0.12	0.27	0.21	0.21
Social Participation	0.05	0.07	0.09	0.05	0.09	0.05
Other Income Generating Activities	1.85	0.59	1.97	0.50	1.32	0.65
Personal Time	4.04	3.16	4.31	3.31	3.63	3.10
Total	12.01	13.96	12.78	14.64	15.05	16.23
Sitong Khasmahal						
Crop Production	2.61	2.95	2.97	3.15	3.77	3.56
Livestock Rearing	1.01	1.01	1.20	1.54	1.32	1.56
Forage Collection	0.75	0.73	0.80	0.92	0.72	1.31
Household Work	0.70	4.00	0.65	3.89	0.60	3.42
Fetching Water	0.08	0.14	0.12	0.11	0.11	0.10
Fuel Collection	0.19	0.27	0.25	0.18	0.18	0.16
Social Participation	0.06	0.03	0.05	0.03	0.06	0.04
Other Income Generating Activities	2.86	1.13	2.37	0.46	2.34	0.66
Personal Time	4.40	3.93	4.48	4.27	4.37	4.26
Total	12.66	14.19	12.78	14.55	13.58	15.06

Source: Field Survey

The empirical evidence presented above is inconclusive regarding increased participation in non-agriculture for smaller sized holdings as the results do not hold uniformly for all the three villages under study. Besides, women with larger land holdings may also take up other income generating activities along with agricultural activities during the lean season to augment family income. The effect of size of land holding on women's participation in agriculture and livestock rearing is also inconclusive as positive relation between them has been observed only in one study village i.e. Git Dubling Khasmahal. For a better understanding of these issues further investigation on these aspects will be taken up in the later chapters through econometric analysis.

5.8. CONCLUSION

The present chapter provides an analysis of the nature and extent of women's work in the study area. The socio-economic and demographic account of the villages as revealed by the Census 2011 data highlights the agrarian character of the villages which is evident from the high proportion of agricultural workers, both men and women. Within the agricultural sector a higher proportion of cultivators in comparison to agricultural labourers have been observed which implies less usage of agricultural labour in the hill regions. The socio-economic and demographic characteristics of the field survey data for the three villages shows that among the three villages, Git Dubling Khasmahal village in Kalimpong has a higher proportion of households with agriculture as a primary activity (70 percent) followed by Sitong Khasmahal village in Kurseong (56 percent) and Samalbong village in Darjeeling Sadar (38 percent). The average size of land holding and the average monthly income of the households in Git Dubling Khasmahal village in Kalimpong are also higher than that of the other two villages.

Analysis of the work participation rates (WPRs) in the three villages according to the *usual principal activity status (ps)* reveals higher WPRs for males as compared to the females. However, when the WPRs are calculated according to the *usual subsidiary activity status (ss)* and the *usual status (ps+ss)* they increase for both males and females with the increase for females exceeding the increase for males making the WPRs for females to be greater than that for males. This indicates that most women in the sampled villages participate in the labour force in subsidiary capacity and many do not consider themselves as workers according to the *usual principal activity status*. The structure of employment in the villages shows a higher proportion of women being involved in the agricultural sector in all three villages. Allied activities which include livestock rearing, keeping poultry, rearing of silk worms, fish farming etc. were not taken up as a primary activity in the region but as a

secondary source of household income with most of the workers participating in subsidiary capacity. The off farm jobs for the males included carpentry, driving vehicles, government jobs like the army, teaching or casual jobs in construction/MGNREGA as casual labour or overseer etc. For the women, the off farm jobs included teaching, government jobs, ICDS helper, petty trade like opening a shop in the precincts of the house selling household articles, tailoring, selling country liquor or casual labour in MGNREGA during the lean season in agriculture.

From the analysis presented in the current chapter the important and the indispensable role of women in rural households in the economy of the Darjeeling hill areas can be properly understood. The significant contribution of women to agricultural activities which include crop production and livestock rearing is obvious through high work participation of women in such activities. Besides, women also undertake a multitude of unpaid household activities along with participation in paid work in farm and off farm activities either on full time or part time basis which further enhances women's contribution to the well being of their families.

Analysis of gender division of labour in different activities related to crop production and livestock rearing reveal the active involvement of women in almost all activities. There are few tasks which are gender specific and women partake in almost all activities related to crop production as family labour including ploughing or hoeing in some cases which is generally considered a man's work. As regards household work, there is very little sharing of such activities by men with the bulk of such work being performed primarily by women which points to the gendered nature of household work.

The study of gender differentials in time allocation also corroborates the above findings. Women's total contributions in terms of time allocated to different activities are larger than that of men in all three villages with women expending the bulk of their time in domestic activities vis-a-vis men who expend more time on personal activities. ANOVA tests reveal significant differences in average total time spent by men and women per day in all the three sampled villages. Therefore, hypothesis (1) which states that women's work burdens in the hill regions are higher than that of men can be accepted in the present study.

In terms of time spent per day, women in Samalbong and Sitong Khasmahal villages expend more time in crop production and livestock rearing whereas in Git Dubling Khasmahal village the opposite is true. The empirical study also reveals higher work participation rates for women in agriculture as compared to men in the three villages. Analysis of variance (ANOVA) tests however reveal statistically non significant results for the time spent by men and women in crop production and livestock rearing in all the three

villages. The study therefore partially accepts the hypothesis (2) that the labour input of women is higher than that of men in agricultural activities.

Among the several productive and non-productive activities that women perform household work which includes cooking, cleaning, washing, caring for children and elderly etc. is fundamental for sustenance of the family. The findings of the present study reinforce the fact widely prevalent in literature on women's work that women bear a disproportionate load of domestic work. The total time devoted by women to such activities is clearly much greater than that of men in all three villages with ANOVA test showing statistically significant results. The study therefore accepts the hypothesis that the labour input of women is higher than that of men in domestic work. The low participation of men in household activities is a reflection of societal norms which consider work within the household or the private space as feminine. Davies and Carrier (1999) observes that "gender division of labour within households are not manifestations of household needs, but a reflection and reinforcement of the much broader organisation of society around assumptions of gender which rationalises the gendered nature of domestic work as 'natural' and therefore 'inevitable' " (Davies and Carrier, 1999).

Since land in rural areas is a primary asset as it determines social status along with economic and political power, women's participation in rural areas may be determined by the amount of land owned by a household. However, the empirical evidence presented in the study does not provide conclusive results regarding increased participation of women in agriculture with increase in size of holdings and increased participation in non-agriculture for smaller sized holdings as the results do not hold uniformly for all the three villages under study. Further investigation on these aspects will be taken up in the later chapters through econometric analysis.

The present chapter, therefore highlights the crucial role of women in the rural hill economy. It can be concluded from the results presented above, that women in the hill regions have high involvement in agriculture and domestic activities, and they spend a major proportion of their time in domestic activities. Collection of resources for household maintenance further adds to their work burden due to depletion of forests, drying up of streams etc. as a consequence of climate change. Rural development policies therefore need to recognise and evaluate women's contributions in a suitable manner and focus on integrating their needs and problems in the development agenda for improving their status in society.

Notes

1. Although ANOVA is fairly robust in terms of the error rate regarding violations of the assumption of homogeneity of variance for equal sample sizes, this is not so for unequal sample sizes. The assumption of homogeneity of variances can be tested using Levene's test, which tests the null hypothesis that the group variances are the same. A significant Levene's test (p value less than 0.05) implies violation of this assumption. In this case the *Brown-Forsythe F* or the *Welch's F* is calculated which have been found to be robust when homogeneity of variance assumption has been violated (Field, 2013). In the ANOVA tests conducted to test for differences in time spent by women according to size class in the three villages, the sample sizes are unequal. Hence Levene's test is conducted to check for homogeneity of variances. In instances where this assumption is violated, the *Brown-Forsythe F* has been considered instead of the F -statistic.
2. If ANOVA is conducted for more than two groups, then a significant F -statistic tells us that the means of the groups are different from each other, but does not provide any information as regards which groups are different from each other. To know which groups are different from each other a *post hoc* test is conducted which consists of pairwise comparisons of all the different combinations of the treatment groups. There are several *post hoc* tests. In this analysis the Games-Howell *post hoc* test has been chosen as it can be used in situations when population variances are different and is also accurate when sample sizes are unequal (Field, 2013).

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Chapter VI

Covariates of Rural Female Work Participation - A Logistic Regression Exercise

6.1. INTRODUCTION

Women's labour market decisions along with the type of work to be done cannot be made by women alone (Atal, 2017) since such decisions depend strongly on the decisions taken at the household level (ILO, 2012, p.35) and are determined by a myriad of factors. Within the household, members of the family divide paid work, unpaid housework (including cooking, cleaning, and washing) and care work (care of small children and the elderly) among themselves to fulfill the household needs. This division of labour among the members of the household is determined by several factors which include individual notions regarding gender roles, child rearing practices, perceptions regarding value of women's contributions etc. These are in turn influenced by household members' relative bargaining power and are affected by "potential income, human capital, economic dependency, potential status in employment along with specific household needs and interests" (*ibid*).

Despite contributing significantly to the functioning of an economy, female labour force is one of the most underutilized and neglected human resource, particularly in the Third World nations which makes them disadvantaged socially and economically and has important implications for economic welfare and growth (Psacharopoulos and Tzannatos, 1989). The Human Development Report, 2015 notes that with regard to work-both unpaid care work and paid work, there are significant imbalances between men and women with women performing three times more than men when unpaid work is considered, while men's share is nearly twice that of women in case of paid work mostly outside the home (UNDP, 2015, pp. 11-12). The higher involvement of women in unpaid work is not a question of their choice, but is determined by societal norms regarding the gender division of labor which considers men to be the breadwinner and women to be the "home-maker, mother and dependent" (ActionAid 2017, p. 15). Since it does not have any exchange value, unpaid work escapes statistical visibility as labour force statistics of most countries measure only paid work. Further, many women do not consider themselves as being employed, if they are not earning wages in cash (Sundar, 1981).

It has been argued that in contrast to women who are involved only in domestic work, women who earn wage income enjoy a higher status within and outside the household and have increased bargaining power which may be attributed to the lower valuation of unpaid

household work. Women's participation in paid work may nonetheless not always be empowering. As pointed out by Chakraborty and Chakraborty (2009) increased participation by women during economic distress may cause young girls to drop out of school to help in domestic chores and sibling care which restricts their schooling, and in turn leads to a widening of the gender gap in education and in labour market opportunities. This implies that women, due to lower levels of education may be employed in jobs that have low productivity and are casual in nature. Gender segregation within the household is therefore translated into gender segregation in the labour market.

Labour force participation of women is known to be a function of multifarious factors. More than economic, non-economic factors have been found to be significant in explaining the labour market behaviour of women. Besides economic variables such as education, experience, wages, and incomes, scholars argue that female labor supply may be determined by non economic variables such as marital status and fertility, urbanization, ownership of land and size of farm, status of household head, and structure of employment (Psacharopoulos and Tzannatos, 1989). Being determined by such varied factors there is considerable heterogeneity in the female labour force participation rates between different regions and nations. As appropriately mentioned by Standing (1981) since the level, patterns and trends in female labor force participation vary widely between and within countries it would be misleading to make any generalizations (Standing, 1981 cited in *ibid*). Female labour force participation should therefore be analysed with reference to the socio-economic and demographic characteristics of the area under study.

With this objective in view, the present chapter looks into the contribution of rural women to the hill economy in terms of their work participation in paid work and unpaid work in family farms. A theoretical framework is initially formulated to understand the work contributions of the rural women to the food and economic security and the welfare of the households. Thereafter, using binary logistic regression analysis the study isolates the determinants of women's work participation in the study area.

6.2. WOMEN'S WORK AND THEIR CONTRIBUTIONS TO HOUSEHOLD FOOD AND ECONOMIC SECURITY- A THEORETICAL FRAMEWORK

Following Sidh and Basu (2011) a theoretical framework may be formed for understanding women's work in the study area and their contribution to fulfilling the family's requirements of food, economic and non-economic goods for ensuring the food and economic security of the household as shown in Figure 6.1. The households comprise adult male and female

members along with children or older family members. Women of the region perform multiple tasks for ensuring food and economic security of the household. They are responsible for family subsistence and in many instances such as female headed households they are the primary or sole economic providers (Agarwal, 1989). The activities performed by women in the study area may be broadly classified into four categories- crop production; livestock rearing; unpaid household activities which includes collection of fuel wood, fodder for animals, water and non-timber forest products; and participation in paid activities.

Agricultural production is a function of the amount of land owned by the households, along with farm animals, farm implements and the inputs of male and female labour-own or hired. Women in the region play an important role in crop production by participating in most activities either as principal or subsidiary status workers. Agriculture in the region is primarily for subsistence although in certain households it is carried out for commercial purposes. Most of the families grow their own vegetables and also paddy in some cases, most of which is used for self consumption. Households also derive income from sale of agricultural products which include cash crops such as black cardamom, broom grass, red round chillies, and some seasonal vegetables like squash, green leafy vegetables etc. Households use inputs of family labour-male, female and child for maintenance of farm animals like cows, goats, pigs, poultry etc. which is also used to fulfill the family's requirements for milk and dairy products, eggs, meat etc. and also supplement family income when these products are sold in the market. Livestock, particularly bovines supply manure and draught power in crop production activities. The labour inputs of women in crop production and livestock rearing thus contribute substantially to household food security directly by supplying food articles, and indirectly through the sale of these products in the market, thus ensuring food and economic security of the households.

Typical of rural economy, women in the region are burdened with the responsibility of running the household which includes activities that lie outside the purview of conventional economic activities. Household tasks are plenty and include preparing food, washing and cleaning, maintaining the households, purchasing household articles and looking after the children and the elderly. Women perform these tasks with little or no help from the men. Collection of fodder for animals, fuel wood, water and non timber forest products require the labour inputs of men, women and sometimes children. Household work, the disproportionate burden of which is borne by the women is indispensable for the proper functioning of the households and therefore contributes significantly to the welfare and food

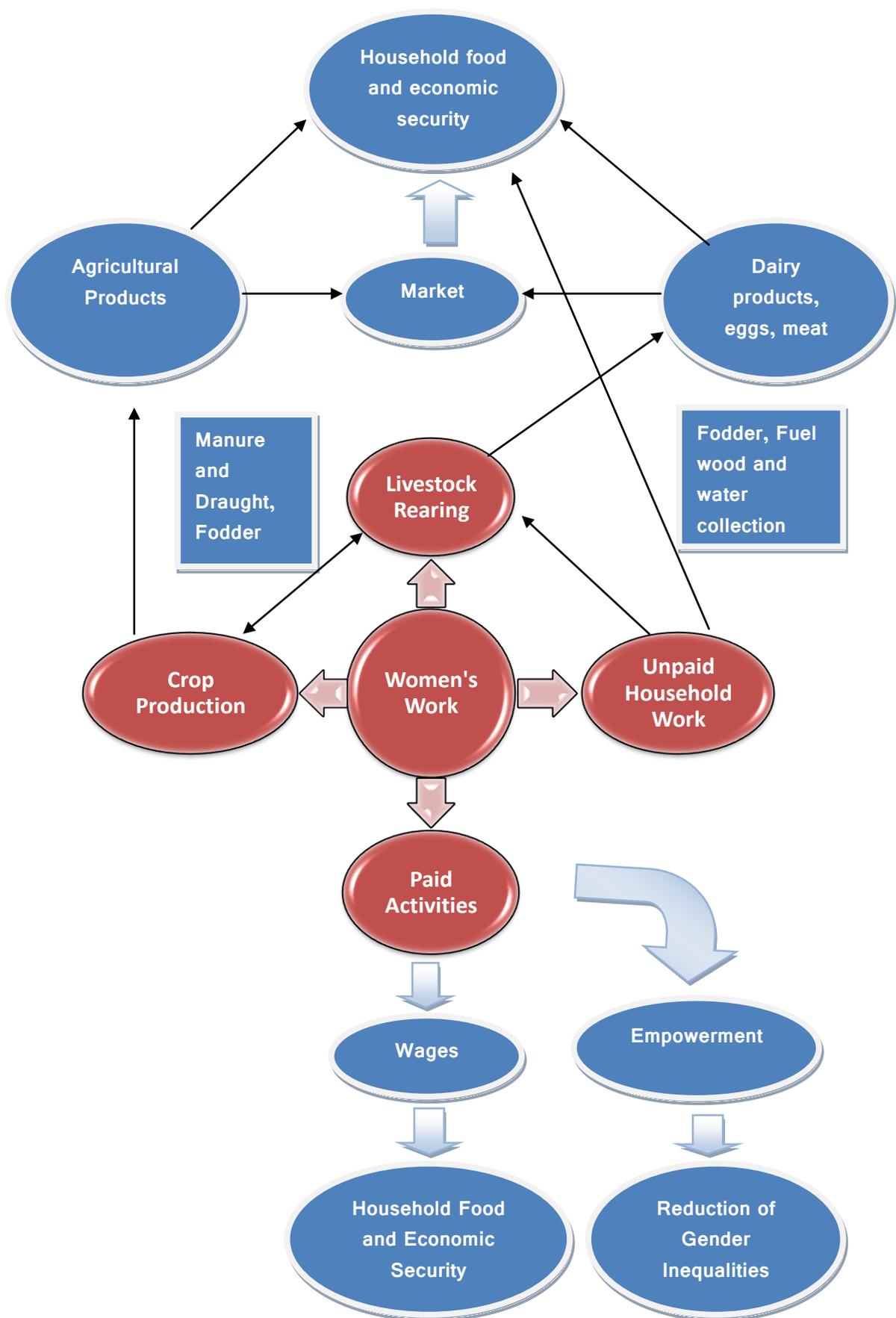


Figure 6.1: Women's Work and their Contribution to Food and Economic Security

security of the households. Besides, women are also involved in building up of family networks and inter-household relationships in the village, which often prove to be of critical importance for survival during periods of food shortages (Agarwal, 1988a cited in Agarwal, 1989).

In comparison to men, women's ability to participate in economic activities is less and constrained by the burden of household work and child care which men do not face. Being time intensive, household and child care responsibilities restrict women's mobility outside the home and limit the time spent by women in other income generating activities. Participation in paid activities which generally includes non-farm activities or farm activities as paid agricultural labour on somebody else's farms directly contributes to household food and economic security by enhancing the household income. In addition it makes women socially and economically empowered ultimately leading to reduction in gender inequalities. On the contrary, participation in paid activities may increase women's work burdens since they now have to work both within and outside the households leading to a dual burden (Choudhary and Parthasarathy, 2007) since the participation of men in so-called feminine indoor tasks is not evident (Bittman and Matheson, 1996 cited in *ibid*) even when women participate in activities outside the household.

The realization of women's responsibility in achieving food and economic security for the family is however limited by their unequal access to resources-an inequality arising not by virtue of their class but by virtue of their gender. These inequalities may be in the form of differences in the distribution of basic necessities within the family, disadvantaged position of women in the labour market, women's limited access to means of production such as land and production technology along with deterioration and privatisation of common property resources which are critical for the sustenance of the poor, particularly women (Agarwal, 1989).

6.3. DETERMINANTS OF RURAL FEMALE WORK PARTICIPATION-A LOGISTIC REGRESSION EXERCISE

Although sufficient research exists on women's work participation and its determinants in different regions of the country, literature on women's work participation rates in the hill and mountain regions of the country which is relatively high is somewhat limited. As per the Census 2011 data, the hill district of Darjeeling (including Kalimpong sub-division) in West Bengal ranked third among all the districts for rural female WPR with a value of 26 per cent, which was also higher than the state average of 19.4 per cent. In the hill regions agricultural

activities are often conducted for subsistence and are distinctly different from those practiced in the plains, due to constraints imposed by altitude and topography. Women's participation in economic activities in such settings is affected by several factors that have received little attention from scholars. Keeping this in mind, the present section attempts to identify the determinants of work participation of rural women in the hill region in the district of Darjeeling (including Kalimpong sub-division).

The Employment and Unemployment Survey of the National Sample Survey Organisation (NSSO), 68th Round, defines economic activity as any activity which leads to the production of goods and services and adds to the national product. It includes "(i) production of all goods and services for the market (i.e. for pay or profit) including government services, (ii) production of primary commodities for own consumption, and (iii) own account production of fixed assets" (GoI, 2013). In the present study, the work participation of women is based only on *usual principal activity status*, i.e. a woman is said to be in the workforce according to the *usual status (ps)* if she participates in any kind of activity for the major part of the 365 days preceding the survey. Women who are primarily engaged in household work and participate in economic activities according to the *usual subsidiary activity status (ss)* are considered to be outside the workforce. Unemployed women are not included in the workforce. The workforce therefore includes women in paid employment and those who work as unpaid family labour on family farms (Rai and Mukherjee, 2018). Women who participate in economic activities according to *subsidiary activity status* have not been considered in the present analysis since women (and men) in rural areas are engaged in multiple occupations on a subsidiary basis to augment family income. Even women who are out of the workforce as per *principal activity status* may be engaged in some form of economic activity such as family labour on family farms or involved in animal husbandry if *subsidiary activity status* is taken into account. Inclusion of workers according to *subsidiary activity status* would lead to very less/no participants in the category of non-workers, and have thus been excluded from the present analysis.

Following Ackah, Ahiadeke and Fenny (2009), two alternative models have been estimated in the present analysis on the basis of female workforce participation. Model I takes into consideration both paid and unpaid employment of women as participation in the workforce. It includes women in paid/wage work or self-employment, as well as those engaged in family farms as unpaid family labour. In order to arrive at the determinants of women's paid work, Model II considers a more restrictive definition of participation that includes only paid market work, but covers both wage work and self-employment. Paid

market work may be distinguished from unpaid work as “work that is remunerated in cash or kind in the shape of wages, salaries and profit” whereas unpaid work is work “performed without any direct remuneration” (Actionaid 2017, p. 13). The data were analysed using Statistical Package for the Social Sciences (SPSS) version 23 and Econometric Views (EViews) version 10 (Rai and Mukherjee, 2018).

6.3.1. Model Specification

The decision to participate or not to participate in the work force is a binary one and can take only two values i.e. either a “yes” or a “no”. Given the dichotomous nature of the response variable binary logistic regression has been used in the present analysis. In the binary logistic regression model, the female work force participation which is the dependent variable (Y) can take only two values, $Y_i = 1$ if the respondent is in the workforce and $Y_i = 0$ if the respondent is not in the workforce. The dependent variable is determined by the predictor variables X_i s also known as covariates which may be numerical or categorical in nature. For a categorical variable, dummy variable is used to compare the different categories. For each categorical variable a baseline or reference category is chosen and all other categories are compared to the baseline category. For a categorical variable with k categories, k-1 dummy variables are to be introduced (Gujarati 2004, p. 302).

If P_i represents the probability for the i^{th} female respondent to be in the workforce, the model may be written as

$$\text{Probability [A female is the workforce]} = P_i (Y = 1) = \frac{1}{1+e^{-Z}} = \frac{e^Z}{1+e^Z} \quad \text{-----(1)}$$

where Z is a linear function of the explanatory variables. If X_1, X_2, \dots, X_k represent the various explanatory variables, then “Z” equation would be

$$Z_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_k X_k$$

$X_i = i^{\text{th}}$ Explanatory variables ($i = 1, 2, \dots, k$) and

$\beta_i =$ Parameters of the model ($i = 0, 1, 2, \dots, k$)

This is known as the cumulative logistic distribution function. From the above equation it can be seen that the P_i is nonlinear not only in X_i s but also in the β 's. Hence the Ordinary Least Squares (OLS) procedure cannot be used to estimate the parameters of the equation. However it can be linearized in the following manner. If P_i is the probability of a female being in the workforce, then $(1 - P_i)$ is the probability of the female not being in the workforce which may be written as

Probability [A female is not in the workforce] = 1- P_i ($Y = 1$)

$$= 1 - \frac{1}{1+e^{-Z}}$$

$$= \frac{1}{1+e^Z} \text{-----(2)}$$

Now we can write $\frac{P_i}{1-P_i} = \frac{1+e^Z}{1+e^{-Z}} = e^Z$ -----(3)

Here $\frac{P_i}{1-P_i}$ are the odds in favour of a respondent participating in the workforce which is simply the ratio between the probabilities of an event occurring to the probability of not occurring. Taking the natural logarithm of the odds we get

$$L_i(\text{logit}) = \ln\left(\frac{P_i}{1-P_i}\right) = Z_i \text{-----(4)}$$

$$L_i = \ln\left(\frac{P_i}{1-P_i}\right) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_k X_k \text{-----(5)}$$

It can be seen that L_i the log of the odds is linear not only in X_i s but also in the β 's and is called the logit, hence the name logit model (Gujarati 2004, pp. 595-596). It can also be seen that as the value of P_i changes from 0 to 1, the odds change from 0 to ∞ . When $P_i = 0.5$, the odds are 1. On the odds scale the values from 0 to 1 correspond to values of P_i from 0 to 0.5. On the other hand, values of P_i from 0.5 to 1.0 result in odds of 1 to ∞ . This asymmetry can be corrected by taking the natural logarithm of the odds. When $P_i = 0$, $\ln(\text{odds}) = -\infty$; when $P_i = 0.5$, $\ln(\text{odds}) = 0.0$; and when $P_i = 1.0$, $\ln(\text{odds}) = +\infty$ (Afifi, May and Clark, 2012, p. 272). This implies that although the probabilities lie between 0 and 1, the logit is not bounded and can lie between $-\infty$ and $+\infty$, as such it can have an unlimited range of values. The link function (the function of the dependent variable that yields a linear function of the independent variables) in logistic regression model is therefore the logit transformation (Hosmer and Lemeshow, 2000 pp. 48).

Many of the assumptions of the linear regression models do not apply to logistic regression analysis such as linearity of relationship between the dependent and independent variables, normality of the error distribution, homoscedasticity of the errors, and measurement level of the independent variables. Since logistic regression applies a non-linear log transformation of the linear regression, non-linear relationships between the dependent and independent variables can also be considered in logistic regression. It can also handle continuous and discrete data as independent variables which is a principal advantage of logistic regression model (Park, 2013).

Though the log odds of the dependent variable can be expressed as a linear combination of the predictors, the estimation of the logistic regression through the method of least squares as in linear regression yields estimators with a number of undesirable statistical properties. The most preferred method of estimation for a logistic regression model is maximum likelihood estimation. Estimation under this method requires construction of a function called the likelihood function which expresses the probability of the observed data as a function of the unknown parameters i.e. the β s. The maximum likelihood estimators of these parameters are chosen to be those values that maximise this function i.e. the estimated parameters are those which maximise the probability of obtaining the observed data (Hosmer and Lemeshow, 2000, p. 8).

In logistic regression the results are obtained in the form of the log of odds which is the slope coefficients i.e. the β_i s which measures the change in log odds or logit of participating in the work force for a unit change in the predictor variable holding the other predictor variables constant. In logistic regression, proper interpretation of the coefficient depends on being able to meaningfully explain the difference between two logits (*ibid*, p.48). For a more meaningful interpretation of the results of the logistic regression, the log odds can be converted into the odds ratio by exponentiating the logarithmic values. The odds ratio is a ratio between two odds i.e. the ratio of odds of occurrence of an event between two situations. If we consider two values of the categorical independent variable, X i.e. X=0 and X=1, then the odds ratio for Y=1 may be written as

Odds Ratio = $\frac{P_1/1-P_1}{P_0/1-P_0}$ where P_1 is the probability of Y=1 for X=1 and P_0 is the probability of occurrence of Y=1 for X=0. The numerator therefore represents the odds in favour of the event Y for X=1 and the denominator represents the odds in favour of Y for X=0.

Taking one independent variable X, it can be seen from equation (3) that

$$\frac{P_i}{1-P_i} = \frac{1+e^Z}{1+e^{-Z}} = e^Z \text{ where } Z = \beta_0 + \beta_1 X$$

So the Odds Ratio for X=1 and X=0 can be written as

$$\begin{aligned} \text{Odds Ratio} &= \frac{P_1/1-P_1}{P_0/1-P_0} \\ &= \frac{e^{\beta_0 + \beta_1}}{e^{\beta_0}} \\ &= e^{\beta_1} \end{aligned} \quad \text{----- (6)}$$

It can be seen from equation (6) that the exponentiated coefficient shows the ratio of two odds. This simple relationship between the odds ratio and the coefficient is the primary reason why logistic regression is considered to be such a powerful research tool in analytical studies (*ibid*, pp.48-50). $\exp(\beta)$ is therefore the incremental odds ratio and corresponds to a one unit increase in the variable X, assuming that values of all the other X variables does not change. The incremental odds ratio corresponding to the change of k units in X is $\exp(k\beta)$ (Afifi et. al., 2012, p. 276). A unit increase in the predictor increases or decreases the odds in favour of the event i.e. female work force participation accordingly as the odds ratio is greater than or less than 1 (Rai and Mukherjee, 2018).

6.3.2. Variables Used in the Model

A review of the literature shows that various socio-economic variables influence the work participation behaviour of women. Table 6.1 lists the explanatory variables chosen for analysis along with the expected sign. Age squared has been used to capture the non-linear effect of age.

Table 6.1: Variables Used in the Model (Logistic Regression)

Variables	Notation	Description	Expected Signs
Dependent Variable			
Model I: Female work participation	FLFP	Dummy Variable =1 if participating in the work force =0 otherwise	
Model II: Female work participation in paid work	FLFP_PAID	Dummy Variable =1 if participating in the paid workforce =0 otherwise	
Independent Variables			
Age	AGE	Number of years completed	Positive
Age squared	AGE_SQU	Square of the number of years completed	Negative
Education	EDUCATION	Number of years of schooling	Positive
Family Structure	FAM_STR	Dummy Variable =1 Joint = 0 Unitary	Positive/Negative
Number of children below the age of six years	CHILD_06	Dummy Variable =1 if child below the age of six years is present = 0 otherwise	Negative
Woman's marital status	MARITAL_STATUS	Dummy variable=1 if currently married =0 otherwise	Negative
Primary occupation of household head	OCCUPATION_HEAD	Dummy Variable=1 if primary occupation is agriculture =0 otherwise	Positive
Presence of male migrant member	MIGRANT	Dummy Variable=1 if migrant male member is present =0 otherwise	Positive/Negative
Monthly per capita consumption expenditure	MPCE	Monthly per capita consumption expenditure of household in Rs 1,000	Negative
Land holding	LAND	Ownership holding of the household in acres	Positive/Negative

It is however, very likely that the age and age-squared terms are highly correlated. This is however not something to be concerned about because the p -value of the squared term is not affected by multicollinearity. The high correlation can be reduced by centering the variables (i.e. by subtracting the means) before squaring which will have no effect on p -value of the squared term and results for other variables including the R squared, but not the lower order terms which means that multicollinearity is not a problem (Allison, 2012). In the present analysis age has been centered to reduce multicollinearity. The monthly per capita consumption expenditure of the household has been used as a proxy for household income to avoid the problem of endogeneity in the model. The total expenditure incurred by a household on domestic consumption during the reference period is known as the household's consumption expenditure (GoI, 2014, p. 8). In the present model, household expenditure on food items was estimated per month. For self-produced items such as vegetables and milk, the quantity consumed per month was recorded and the value estimated according to the prevailing market price. Expenditure on other items such as clothing, education, and agricultural inputs was estimated using a one-year recall period. Recall errors are an inherent limitation of the present study. Household monthly per capita consumption expenditure (MPCE) was measured as a continuous variable in thousand rupees (Rai and Mukherjee, 2018).

6.3.3. Selection of Variables

The criteria for inclusion of a variable in a model differs between problems and scientific disciplines. Traditionally, statistical model building involves looking for the most parsimonious model that still explains the data, the rationale for minimising the number of variables in the model being that the resultant model is more likely to be numerically stable, and can be more easily generalised. Some methodologies suggest inclusion of all intuitively relevant variables in the model not considering their statistical significance in order to control for confounding factors. This approach can however, lead to numerically unstable estimates characterised by unrealistically large estimated coefficients and/or large standard errors (Hosmer and Lemeshow 2000, p. 92). For a purposeful selection of variables, Hosmer and Lemeshow suggest carrying out a univariable analysis of each variable (*ibid.*). After completion of the univariable analysis, the significance of the univariate analysis can be examined by comparing the p values for the different explanatory variables to some arbitrary level, which is 0.25. Any variable whose univariable test has a p -value < 0.25 can be included

in the multivariable model (*ibid*, p. 95). The univariate test for both models has been presented in Tables 6.2 and 6.3 (Rai and Mukherjee, 2018).

Table 6.2: Univariate Analysis for Model I (Dependent Variable- FLFP)

FLFP		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1a	AGE	0.106	0.018	33.07	1.000	0.000	1.112
Step 1a	AGE_SQU	-0.004	0.001	16.70	1.000	0.000	0.996
Step 1a	EDUCATION	-0.080	0.032	6.183	1.000	0.013	0.923
Step 1a	FAM_STR(1)	-0.845	0.306	7.633	1.000	0.006	0.430
Step 1a	CHILD_06(1)	-1.221	0.369	10.95	1.000	0.001	0.295
Step 1a	MARITAL_STATUS(1)	1.062	0.321	10.96	1.000	0.001	2.894
Step 1a	OCCUPATION_HEAD(1)	0.965	0.299	10.41	1.000	0.001	2.624
Step 1a	MIGRANT(1)	-0.660	0.334	3.920	1.000	0.048	0.517
Step 1a	MPCE	0.034	0.081	0.175	1.000	0.676	1.034
Step 1a	LAND	-0.025	0.080	0.099	1.000	0.754	0.975

a. Variable(s) entered on step 1: AGE/ AGE_SQU/EDUCATION/ FAM_STR/ CHILD_06/ MARITAL_STATUS/ OCCUPATION_HEAD/ MIGRANT/MPCE/LAND

On the basis of the criteria for selection of variables as proposed by Hosmer and Lemeshow, MPCE and LAND have been excluded as explanatory variables for Model I. For Model II, AGE and MPCE have p values < 0.25 . However, as AGE_SQU is statistically significant, both AGE and AGE_SQU have been included as explanatory variables. MPCE has been excluded due to a p value < 0.25 (Rai and Mukherjee, 2018).

Table 6.3: Univariate Analysis for Model II (Dependent Variable- FLFP_PAID)

FLFP_PAID		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1a	AGE	-0.008	0.017	0.238	1.000	0.625	0.992
Step 1a	AGE_SQU	-0.004	0.002	4.196	1.000	0.041	0.996
Step 1a	EDUCATION	0.084	0.038	5.056	1.000	0.025	1.088
Step 1a	FAM_STR(1)	-1.186	0.403	8.686	1.000	0.003	0.305
Step 1a	CHILD_06(1)	-1.974	1.032	3.662	1.000	0.056	0.139
Step 1a	MARITAL_STATUS(1)	-0.477	0.403	1.401	1.000	0.237	0.621
Step 1a	OCCUPATION_HEAD(1)	-0.507	0.374	1.839	1.000	0.175	0.602
Step 1a	MIGRANT(1)	-1.176	0.627	3.520	1.000	0.061	0.308
Step 1a	MPCE	0.014	0.100	0.020	1.000	0.888	1.014
Step 1a	LAND	-0.649	0.246	6.962	1.000	0.008	0.523

a. Variable(s) entered on step 1: AGE/ AGE_SQU/EDUCATION/ FAM_STR/ CHILD_06/ MARITAL_STATUS/ OCCUPATION_HEAD/ MIGRANT/MPCE/LAND

6.4. REPORTING THE LOGISTIC REGRESSION RESULTS

6.4.1. Frequency Table of Binary Responses

The frequencies of the binary response variable i.e. female work force participation for Model I and Model II have been represented graphically (Figure 6.2) and in tabular form (Table 6.4) below.

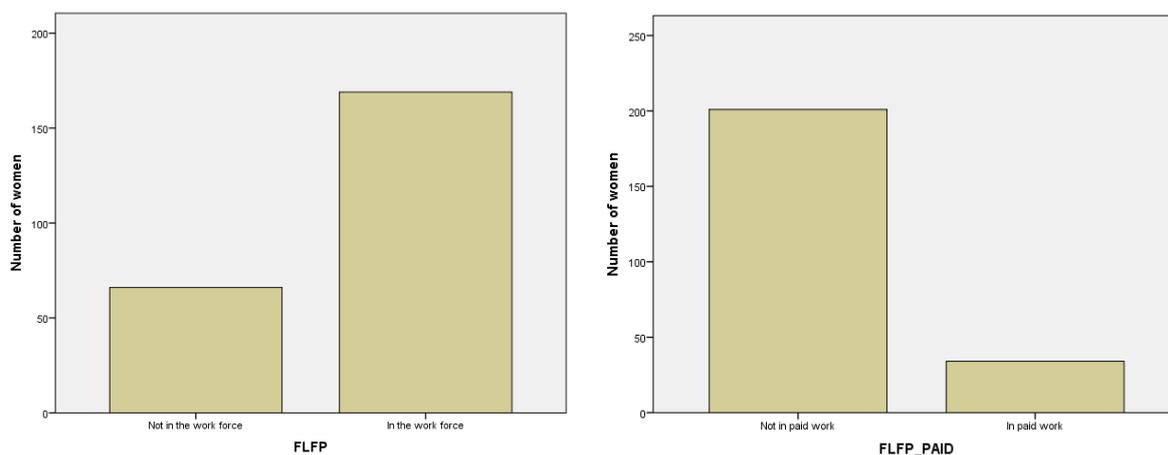


Figure 6.2: Frequency of Binary Response Variable (Model I: Dependent Variable-FLFP and Model II: Dependent Variable-FLFP_PAID)

The number of households surveyed in each of the three villages was 50 leading to a total of 150 households surveyed. Among the surveyed households only women between the ages of 15 and 65 were considered for the analysis, irrespective of whether or not they participated in an economic activity. Females attending educational institutions were excluded from the analysis. This gave a total sample size of 235 (Samalbong village-68; Git Dubling Khasmahal-74; Sitong Khasmahal-93).

Table 6.4: Frequency Table for the Binary Response Variable (Model I Dependent Variable-FLFP and Model II Dependent Variable-FLFP_PAID)

		Frequency	Percent	Valid Percent	Cumulative Percent
Model I					
Valid	FLFP=0	66	28.1	28.1	28.1
	FLFP=1	169	71.9	71.9	100
	Total	235	100	100	
Model II					
Valid	FLFP_PAID=0	201	85.5	85.5	85.5
	FLFP_PAID=1	34	14.5	14.5	100
	Total	235	100	100	

Among 235 working aged women, 169 (71.9 percent) are participating in the work force as opposed to 66 (28.1 percent) who are participating only in domestic activities according to Model I. According to Model II which takes into account women's paid activities, 34 (14.5 percent) are participating in the work force compared to 201 (85.5 percent) who are participating either as unpaid family labour on family farms or are engaged in domestic activities only (Rai and Mukherjee, 2018).

6.4.2. Summary Statistics

Table 6.5 shows the mean and standard deviation of the explanatory variables used in the study for the two models. The average age of women in the work force in Model I (40.97) is higher than that in Model II (37.29). However, the level of education as measured by years of schooling for women who are in the work force is higher for Model II (8.71) than for Model I (6.11). The average size of landholding of women in the work force in Model II is lower than that in Model I, whereas the average monthly per capita consumption expenditure of women who are in the workforce is almost equal in the two models. The average monthly per capita consumption expenditure for women who are in the work force for Model I is Rs 2,867.81 and Rs 2,877.35 for Model II; and the average size of landholding is 1.97 acres for Model I and 1.26 acres for Model II. For the categorical explanatory variables, the means indicate the proportion of cases with value of the explanatory variable = 1 in each category of the dependent variable. For example, a mean of 0.48 for FAMILY_STR for FLFP = 1 implies that 48 per cent of women in the work force in Model I are in joint families (Rai and Mukherjee, 2018).

Table 6.5: Summary Statistics of Sample

Explanatory Variables	Model I				Model II			
	FLFP=1 N=169		FLFP=0 N=66		FLFP_PAID=1 N=34		FLFP_PAID=0 N=201	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
AGE	40.97	9.38	30.94	11.98	37.29	8.59	38.3	11.5
EDUCATION	6.11	5.19	8.08	4.39	8.71	7.91	6.32	4.31
FAMILY_STR	0.48	0.50	0.68	0.47	0.29	0.46	0.58	0.50
CHILD_06	0.11	0.31	0.29	0.46	0.03	0.17	0.18	0.38
MARITAL_STATUS	0.82	0.39	0.61	0.49	0.68	0.48	0.77	0.42
OCCUPATION_HEAD	0.62	0.49	0.38	0.49	0.44	0.50	0.57	0.50
MIGRANT	0.18	0.39	0.30	0.46	0.09	0.29	0.24	0.43
MPCE	2.87	1.72	2.76	2.11	2.88	1.56	2.83	1.88
LAND	1.97	1.73	9.34	1.92	1.26	0.87	2.12	1.87
Sample Size	235				235			

6.5. EVALUATION OF THE LOGISTIC REGRESSION MODEL

6.5.1. Likelihood Ratio Test

The overall fit of the model can be assessed by comparing the fit of the intercept-only model or the null model with the model containing the independent variables. A logistic regression model with a given number of independent variables (the given model) is said to provide a better fit to the data if it reveals an improvement over the model with no independent variables (the null model) (Park, 2013). The overall fit of the model can be examined via a likelihood ratio test. It measures how the explanatory variables improve the fit of the given model compared to the null model.

The likelihood ratio test is based on $-2\log$ likelihood ratio in which a comparison is made between the deviance with just the intercept ($-2 \log$ likelihood of the null model) and the deviance when the k independent variables have been included ($-2 \log$ likelihood of the given model) (*ibid*). The likelihood of obtaining the observation if the independent variables had no effect on the result is the likelihood of the null model, whereas likelihood of the given model is the likelihood of obtaining the observations with all independent variables incorporated in the model (*ibid*). The Likelihood ratio statistic (LR) obtained from the $-2\log$ likelihood ratio yields a goodness of fit index χ^2 statistic with k degrees of freedom (Bewick, Cheek, & Ball, 2005 cited in *ibid*). Significance at the .05 level or lower implies that the given model with the predictors is significantly different from the null model i.e. the constant only model which means that at least one of the independent variables contributes to the outcome.

Table 6.6: Omnibus Tests of Model Coefficients-Model I and Model II

Model I Dependent Variable=FLFP					Model II Dependent Variable=FLFP_PAID				
		Chi-	df	Sig.			Chi-square	df	Sig.
Step 1	Step	94.443*	8	0.000	Step 1	Step	46.268#	9	0.000
	Block	94.443	8	0.000		Block	46.268	9	0.000
	Model	94.443	8	0.000		Model	46.268	9	0.000

*Initial $-2 \log$ Likelihood=279.065, Model $-2 \log$ Likelihood=184.622, hence LR statistic=279.065-184.622=94.443 #Initial $-2 \log$ Likelihood=194.284, Model $-2 \log$ Likelihood=148.016, hence LR statistic=194.284-148.016= 46.268

The statistical software used for the present analysis i.e. SPSS version 23 provides the table for the Iteration History which shows the value of the initial $-2 \log$ Likelihood and the $-2 \log$ Likelihood under the given model with predictors. The difference between the initial $-2 \log$ Likelihood and the model $-2 \log$ Likelihood gives the LR statistic which is referred to as

the Omnibus Tests of Model Coefficients and is shown in the Table 6.6. For both the models the model chi square turns out to be significant indicating that at least one of the predictors is significantly related to the outcome variable. In the present analysis since all the variables have been entered at the same time using the block entry of variables there is only one model to be compared with the null model, there is no difference in the results in step, block or model chi-square values (Rai and Mukherjee, 2018).

6.5.2. Hosmer and Lemeshow Goodness of Fit

Hosmer and Lemeshow proposed a goodness-of-fit test, now universally referred to as the Hosmer-Lemeshow test. The Hosmer-Lemeshow (H-L) statistic measures the difference between the observed and the predicted values of the dependent variable. Hosmer and Lemeshow proposed grouping of the observations into deciles on the basis of estimated probabilities (Hosmer and Lemeshow, 2000, p.147). This is shown by the Contingency Table for the Hosmer and Lemeshow Test shown in Appendix B. The H-L test statistic is then computed which asymptotically follows a χ^2 distribution with 8 (number of groups -2) degrees of freedom (Park, 2013). The probability value (p) is also computed to test the goodness of fit of the model. A non-significant chi-square value for the H-L statistic ($p>0.05$) indicates a good fit model as it implies that the model prediction is not significantly different from the actual values. In the present analysis, as can be seen from Table 6.7 the H-L statistic for both the models yields a desirable outcome which is non significant ($p=0.636$ for Model I and $p=0.557$ for Model II) indicating that the predicted model does not significantly differ from the observed model (Rai and Mukherjee, 2018).

Table 6.7: Hosmer and Lemeshow Goodness of Fit Test

Model I Dependent Variable-FLFP				Model II Dependent Variable-FLFP_PAID			
Step	Chi-square	df	Sig.	Step	Chi-square	df	Sig.
1	6.101	8	0.636	1	6.812	8	0.557

6.5.3. R² Equivalents for logistic regression/ Pseudo R-square

As compared to the R² in Ordinary Least Squares (OLS) regression which measures the overall fit of the linear regression model by explaining the proportion of variation in the dependent variable due to the independent variables, no such equivalent measure is present in logistic regression. However, a number of measures sometimes referred to as Pseudo R-square may be used as an equivalence of the R² in OLS although no consensus exists as to which one is the best. The two most commonly used measures of Pseudo R-square as reported by SPSS are Cox & Snell R Square and Nagelkerke R Square. The problem with

Cox and Snell's R square as suggested by Cox and Snell (1989) is that it does not reach the maximum value of 1 which makes it difficult to interpret. The Nagelkerke R-square is an improvement over the Cox and Snell's R square and a more reliable measure. Since its value ranges from 0 to 1 Nagelkerke's R square will normally be higher than the Cox and Snell measure. There is another measure that corresponds to Pseudo R² as reported by EViews which is the McFadden R squared whose value ranges from 0 to 1.

The Pseudo R square values for both the models have been presented in Table 6.8. It has been mentioned that there exists a direct empirical relationship between the R² of a linear regression model and the pseudo R² of a choice model (Domencich and Mc Fadden, 1975) with pseudo R² values between the range 0.3 and 0.4 being translated as an R² of between 0.6 and 0.8 for the linear model equivalent (cited in Hensher, Rose and Green, 2005, pp. 338-339). Since the pseudo R² as shown by Nagelkerke R square is 0.476 and 0.318 for the two models the model fit is quite satisfactory for both the models (Rai and Mukherjee, 2018). Afifi et.al (2012) however notes that many statisticians consider pseudo R² to be of limited value since it does not represent the proportion of variation explained by the covariates and should not be interpreted as R² in multiple regression (Afifi et.al., 2012, p. 295).

Table 6.8: Values of Pseudo R²

Pseudo R²	Model I (Dependent variable – FLFP)	Model II (Dependent variable – FLFP_PAID)
McFadden R-square	0.338	0.238
Cox and Snell R-square	0.331	0.179
Nagelkerke R-square	0.476	0.318

a. Estimation terminated at iteration number 5 because parameter estimates changed by less than .001.

b. Estimation terminated at iteration number 6 because parameter estimates changed by less than .001.

6.5.4. Classification Table

The predictive accuracy of a fitted logistic regression model can be done through an examination of the Classification Table. The Classification Table shows how far the predicted probabilities are in conformity with the actual outcomes. This table is obtained as a result of cross-classifying the outcome variable, in this case female work force participation, with a dichotomous variable whose values have been derived from the estimated logistic probabilities (Hosmer and Lemeshow, 2000 pp.156). The estimated probabilities are compared to a defined cut-off value, which is usually 0.5. For cases where estimated probabilities exceed 0.5 the derived dichotomous variable is coded as having value 1 or else having a value 0 (*ibid*).

Table 6.9: Classification Table- Model I

Observed			Predicted			Observed	Predicted		
			FLFP		Percentage Correct		FLFP		Percentage Correct
		0	1			0	1		
Step 0	FLFP	0	0	66	0.0	Step 1b	36	30	54.5
		1	0	169	100.0		14	155	91.7
a b	Overall				71.9			81.3	

a. Constant is included in the Model. b. The cut value is .500

The Classification Table for Model I (Table 6.9.) shows that the model correctly predicts 81.3 percent observations as compared to the constant only model. Sensitivity which is defined as the proportion of observations with Y=1 that are correctly predicted by the model is 91.7 and specificity defined as the proportion of observations with Y=0 that are correctly predicted by the model is 54.5 percent. The estimated equation is 9.4 percentage points better at predicting responses than the constant only model (Rai and Mukherjee, 2018). The Classification Table for Model II (Table 6.10) shows that the model correctly predicts 88.1 percent observations as compared to the constant only model. Sensitivity is 20.6 and specificity is 99.5 percent. The estimated equation is 2.6 percentage points better at predicting responses than the constant only model (Rai and Mukherjee, 2018).

Table 6.10: Classification Table for Model II

Observed			Predicted			Observed	Predicted		
			FLFP_PAID		Percentage Correct		FLFP_PAID		Percentage Correct
		0	1			0	1		
Step 0	FLFP_PAID	0	201	0	100.0	Step 1b	200	1	99.5
		1	34	0	0.0		27	7	20.6
a b	Overall				85.5			88.1	

a. Constant is included in the Model. b. The cut value is .500

6.5.5. Multicollinearity in the Model

One of the important problems encountered in linear and logistic regression is the problem of multicollinearity which may be defined as a statistical phenomenon in which two or more independent variables are highly correlated or associated (Midi, Sarkar and Rana, 2010). In the presence of multicollinearity, the estimates of the regression coefficients are unstable and may have large standard errors besides leading to inaccurate results (Afifi et. al., 2012, p. 143). It may also affect calculations regarding individual predictors, although the overall predictive power or reliability of the model is not reduced (Midi et. al., 2010). It may also

lead to incorrect signs and magnitudes of coefficients estimates, which result in erroneous conclusions about relationships between dependent and independent variables (*ibid*).

The detection of multicollinearity in logistic regression model is not straightforward as in the case of linear regression model. One of the most popular methods of detecting the presence of multicollinearity is to construct a correlation matrix of all the explanatory variables used in the analysis. The rule of thumb is that if the pair-wise or zero-order correlation coefficient between two regressors is high, usually greater than 0.8, then multicollinearity is a serious problem (Gujarati, 2004, p. 359). However, high zero-order correlations although sufficient, are not a necessary condition for detecting the presence of multicollinearity because it can exist even though the zero-order or simple correlations are comparatively low (say, less than 0.50) (*ibid*). Other information such as Variance Inflation Factor (VIF), Tolerance, Eigen values, Condition Index may also be used to detect the presence of multicollinearity. The Variance Inflation Factor (VIF) is defined as $VIF = \frac{1}{1-r_{ij}^2}$ where r_{ij} is the partial correlation coefficient between two regressors. VIF shows how in the presence of multicollinearity the variance of an estimator is inflated. As r_{ij}^2 approaches 1, the VIF approaches infinity. That is, the variance of an estimator increases with increase in the degree of collinearity, and it can become infinite in the limit (*ibid*, p. 351). As a rule of thumb, if VIF exceeds 10 it indicates multicollinearity, but in weaker models, such as in logistic regression; values above 2.5 may be a cause for concern (Allison, 2001 cited in Midi et. al., 2010). The inverse of the VIF is the tolerance i.e. $Tolerance = \frac{1}{VIF}$. There is no formal cut off value to use tolerance for detecting multicollinearity. While Myers (1990) suggests a tolerance value below 0.1, Menard (2002) suggests that a tolerance value less than 0.2 to be an indication of the multicollinearity problem. As a rule of thumb, a tolerance of 0.1 or less can be a cause of concern (cited in *ibid*).

Sometimes Eigen values and condition indices are also used to detect the presence of multicollinearity. In the absence of collinearity, the Eigen values, condition indices or condition number will all equal unity, but with increase in collinearity, Eigen values will be both greater and smaller than unity. Multicollinearity problem is indicated by Eigen values close to zero and high condition indices (*ibid*). Another way of expressing these Eigen values is in the form of condition index which represent the square root of the ratio of the largest Eigen value to the Eigen value of interest (*ibid*). A large condition index indicates presence of multicollinearity. Belsley, Kuh and Welsch (1980) indicate that values of condition index greater than 30 can indicate serious problems (cited in Afifi et. al., 2012). An informal rule of

thumb is that multicollinearity is a cause of concern if the condition index is 15, and a cause of very serious concern if it is greater than 30, (Midi et. al., 2010).

Table 6.11: Correlation Matrix of Explanatory Variables for Women’s Work Participation

	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}
X_1	1									
X_2	0.068	1								
X_3	0.177	0.051	1							
X_4	-0.010	-0.068	0.108	1						
X_5	0.074	-0.054	-0.078	-0.034	1					
X_6	-0.065	0.076	0.113	0.033	-0.145	1				
X_7	0.173	0.024	0.008	-0.025	-0.070	-0.062	1			
X_8	-0.430	0.028	-0.344	0.176	0.047	-0.031	0.053	1		
X_9	-0.213	0.210	-0.029	-0.179	-0.143	0.113	0.038	0.283	1	
X_{10}	0.136	0.167	-0.130	-0.046	0.266	0.011	0.138	-0.013	-0.024	1

Note: X_1 -EDUCATION, X_2 -FAM_STR, X_3 -CHILD_06, X_4 -MARITAL_STATUS, X_5 -OCCUPATION_HEAD, X_6 -MIGRANT, X_7 -MPCE, X_8 -AGE, X_9 -AGE_SQU, X_{10} - LAND

In the present analysis the pair wise correlation coefficients between the regressors exhibit values less than the cut off value of 0.8 as can be seen from Table 6.11. Further, for both the models as shown in Appendix B, the values for the Tolerance, VIF, Eigen Value and Condition Indices are well within the cut off range to rule out multicollinearity among the predictors (Rai and Mukherjee, 2018).

6.6. RESULTS AND DISCUSSION

The results of the binary logistic regression analyses which was conducted using SPSS software version 23 to determine the factors affecting female work participation in the study area is presented in the Tables 6.12 and 6.13 for both the models. The full model including all the predictor variables was tested against the constant only model and was found to be statistically significant, indicating that the set of predictors helped explain the work force participation behaviour of the women in the study area (Chi-square= 94.443 for Model I at $p=0.000$ at 8 degrees of freedom and Chi-square= 46.268 for Model II at $p=0.000$ at 9 degrees of freedom as shown in the Table 6.6 above). The pseudo R square values (Cox & Snell R Square=0.331, Nagelkerke R Square=0.476 and McFadden R square= 0.338) for Model I show that 33-48 percent of the variations in female work participation is explained by the set of predictor variables. The pseudo R square values for Model II are Cox & Snell R Square=0.179, Nagelkerke R Square=0.318 and McFadden R square= 0.238. The Classification Table shows the extent to which the predicted probabilities agree with the

actual outcomes. Here the percentage of correct predictions by the model is 81.3 percent for Model I and 88.1 percent for Model II (Rai and Mukherjee, 2018).

6.6.1. Results from the Logistic Regression

Tables 6.12 and 6.13 present the results of the binary logistic regression analyses. The *p*-values of the Wald statistics in Table 6.12 show that the variables that are significant in explaining female work force participation as per Model I are AGE, AGE_SQU, FAM_STR, and OCCUPATION_HEAD.

The estimated logit equation for Model I may therefore be written as:

$$\text{Predicted logit of FLFP} = 1.850 + 0.104 \text{ AGE} - 0.006 \text{ AGE_SQU} - 0.696 \text{ FAM_STR} + 0.942 \text{ OCCUPATION_HEAD} + u_i$$

Where u_i is the stochastic error term.

Table 6.12: Binomial Logistic Regression Estimates for Female Work Force Participation- Model I

Variables in the Equation-Model I									
		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B)	
								Lower	Upper
Step 1 ^a	AGE	.104	.021	24.884	1	.000*	1.109	1.065	1.155
	AGE_SQU	-.006	.001	23.323	1	.000*	.994	.991	.996
	EDUCATION	-.034	.041	.702	1	.402	.966	.891	1.047
	FAMILY_STR(1)	-.696	.394	3.122	1	.077***	.498	.230	1.079
	CHILD_06(1)	-.511	.496	1.062	1	.303	.600	.227	1.586
	MARITAL_STATUS(1)	.619	.445	1.938	1	.164	1.857	.777	4.441
	OCCUPATION_HEAD(1)	.942	.385	5.980	1	.014**	2.566	1.206	5.459
	MIGRANT(1)	-.358	.447	.639	1	.424	.699	.291	1.681
Constant		1.850	.587	9.948	1	.002**	6.361		

* significant at $\alpha=0.001$, ** significant at $\alpha=0.050$, *** significant at $\alpha=0.100$

a. Variable(s) entered for step 1: AGE, AGE_SQU, EDUCATION, FAM_STR, CHILD_06, MARITAL_STATUS, OCCUPATION_HEAD, MIGRANT

The variables that are significant in explaining women's work participation in paid activities are EDUCATION, FAM_STR, CHILD_06, and LAND. The estimated logit equation for Model II may be written as:

$$\text{Predicted logit of FLFP_PAID} = 0.353 + 0.121 \text{ EDUCATION} - 0.938 \text{ FAM_STR} - 2.165 \text{ CHILD_06} - 0.755 \text{ LAND} + u_i$$

Where u_i is the stochastic error term.

Table 6.13: Binomial Logistic Regression Estimates for Female Work Force Participation- Model II

Variables in the Equation									
		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B)	
								Lower	Upper
Step 1 ^a	AGE	.001	.027	.001	1	.973	1.001	.950	1.055
	AGE_SQ	-.003	.002	1.928	1	.165	.997	.993	1.001
	EDUCATION	.121	.048	6.362	1	.012**	1.129	1.027	1.241
	FAMILY_STR(1)	-.938	.458	4.185	1	.041**	.392	.159	.961
	CHILD_06(1)	-2.165	1.075	4.059	1	.044**	.115	.014	.943
	MARITAL_STATUS(1)	-.636	.511	1.546	1	.214	.530	.194	1.443
	OCCUPATION_HEAD(1)	-.608	.435	1.955	1	.162	.545	.232	1.276
	MIGRANT(1)	-.983	.667	2.176	1	.140	.374	.101	1.382
	LAND	-.755	.278	7.409	1	.006**	.470	.273	.809
	Constant	.353	.687	.263	1	.608	1.423		

** significant at $\alpha=0.050$

a. Variable(s) entered on step 1: AGE, AGE_SQU, EDUCATION, FAM_STR, MARITAL_STATUS, OCCUPATION_HEAD, MIGRANT, LAND.

6.6.2. Interpretation of Log Odds and Odds Ratio

The interpretation of the results of the analysis involves two issues: (i) determination of the functional relationship between the outcome and the predictor variable, and (ii) determining the unit of change for the predictor variables. In linear regression the interpretation of the slope coefficients for the independent variables is straightforward as the slope coefficients represent the resulting change in the outcome variable for a unit change in the predictor variable. In the logistic regression model, the link function is the logit function and the slope coefficients represent the change in the logit corresponding to a change of one unit in the independent variable (Hosmer and Lemeshow, 2000 pp. 47-48). Therefore, the slope coefficient for a particular predictor variable (represented as the Bs in the results table) is the logarithm of the odds or the logit and shows the change in estimated log odds (or logit) of being in the work force i.e. for $Y=1$, for a unit change in that predictor variable, other predictors being held constant. The sign of the B-values (β) (showing the sign of the partial effects of each predictor) shows whether an explanatory variable has a positive or negative effect on the outcome variable, in this case female work force participation. For example, the estimated log of odds or logit, i.e. B value for the variable FAMILY_STR(1) is equal to minus (-) 0.696 for Model I, which implies that the estimated logit for a female in the workforce decreases by a factor 0.696 if the participant belongs to a joint family as compared to a participant in a nuclear family. The slope coefficients vary between plus and minus

infinity with a value 0 indicating that the given predictor variable does not affect the logit (Rai and Mukherjee, 2018).

According to Model I, the log of odds of a female participating in the workforce is significantly positively related to age (AGE) and the primary occupation of the household head (OCCUPATION_HEAD); and significantly inversely related to the age squared term (AGE_SQU) and structure of the household (FAM_STR). According to Model II, the log of odds of a female participating in paid work is significantly positively related to the years of schooling (EDUCATION); and significantly inversely related to family structure of the household (FAM_STR), the presence of a child below the age of six (CHILD_06), and the size of land owned by the household (LAND) (Rai and Mukherjee, 2018).

The parameter estimates of the binary logistic regression may also be easily interpreted in terms of the odds ratio which is nothing but the exponential of the B-values (β) and provides a directly understandable statistic for the relationship between the outcome variable and the specific predictor variable (given all the other predictor variables in the model are fixed) (Afifi et.al. pp. 275). For categorical predictor variables with two categories (i.e. $X=0$ and $X=1$), the odds ratio approximates how much more likely (or unlikely) it is for the outcome to be present among those with $X=1$ than among those with $X=0$ (Hosmer and Lemeshow, 2000 pp.49-50). While interpreting the odds ratio for a categorical variable it is important to keep in mind the coding for the two categories of the variable. In SPSS, the first or the last category can be chosen as the baseline category. Usually the absence of the factor is coded as 0 and the presence of the factor as 1. In the present analysis the lower category (i.e. $X=0$) is chosen as the baseline category. For a continuous variable X with slope coefficient β , the quantity $\exp(\beta)$ is interpreted as the ratio of the odds for a person with value $(X+1)$ relative to the odds for a person with value X . Therefore, $\exp(\beta)$ is the incremental odds ratio which corresponds to an increase in one unit in variable X , assuming that the values of other X variables remain the same. The incremental odds ratio corresponding to the change of k units in X is $\exp(k\beta)$ (Afifi et. al., pp. 276). In SPSS, the odds ratio appears as Exp (B) in the “Variables in the Equation” table which may be interpreted in the following way. For example, the Exp (B) for FAM_STR(1) for Model I is 0.498, which implies that the odds of being in the workforce for a respondent from a joint family decreases by a factor 0.498 or 50.2 per cent, as compared to a respondent from a nuclear family. On the other hand, the odds ratio or Exp (B) value for EDUCATION in Model II is 1.129. This implies that with an increase in years of schooling of the respondent

by one year, the odds of the respondent being in the workforce increases by 12.9 per cent (Rai and Mukherjee, 2018).

The odds can also be expressed in percent terms which can be obtained by using the following expression: $[\{\text{Exp}(B)-1\} * 100]\%$. If the odds ratio is greater than 1, a unit increase in the predictor increases the odds in favour of the event (i.e. for $Y=1$) by the percent obtained. If the odds ratio is less than 1, a unit increase in the predictor reduces the odds by $[1-\{\text{Exp}(B)\} * 100]\%$. For example, the $\text{Exp}(B)$ for FAM_STR(1) for Model I is 0.498 which implies that the odds of being in the work force for a respondent belonging to the joint family decreases by a factor 0.498 or by $[\{1-\text{Exp}(B)\} * 100]\% = [\{1-0.498\} * 100]\% = 50.2 \%$ as compared to being in the unitary family. On the other hand the odds ratio or $\text{Exp}(B)$ value for EDUCATION in Model II is 1.129. This implies that with an increase in years of schooling of the respondent by 1 year, the odds of the respondent being in the work force increases by $[\{\text{Exp}(B)-1\} * 100]\% = [\{1.129-1\} * 100] \% = 12.9 \%$.

6.6.3. Interpretation of the Results of the Binary Logistic Regression

Scholars have cited age as an important determinant of female work participation. The simultaneous demands made by children and work reduce women's work participation during periods of child-bearing and child-rearing as compared to women outside this age (Psacharopoulos and Tzannatos 1989). During the child-rearing period, female participation declines, but is expected to be the highest before the beginning of and a few years after the child-bearing period (Mon 2000). Reddy (1979) notes that although there is a clear cut negative relationship between female activity rates and child-bearing and child-rearing age-groups in the urban areas, there is no evidence of such an association in the rural areas. This may be due to the prevalence of the joint family system in the rural areas in which the older female members of the family assist in child-rearing (Reddy 1979) with older siblings also helping in the process. In Model I, AGE has a significant positive impact on female workforce participation whereas AGE_SQU has a negative significant effect, which shows the non-linear effect of age. Increase in age is associated with increased work participation up to a certain age, beyond which work participation decreases. This implies that younger women – who perform a greater share of household duties, as well as child-bearing and child-rearing activities – and older women are less likely to be in the workforce, as compared to middle-aged women. When we consider women's paid employment (Model II) however, the age of the respondent is not significant in explaining female work participation in the study areas.

Although theoretically there appears to be a positive correlation between female labour force participation and levels of education, empirical findings from developing countries present mixed results (Standing 1981 cited in Ackah *et al.* 2009). In some cases, education and female participation rates show only a marginal or non-linear relationship (Mon 2000). According to a study by Psacharopoulos and Tzannatos (1989), education has an ambiguous effect on women's participation in the labour force. They postulate that labour force participation rate is affected by the decision to participate in the labour market and by the decision of how much time to spend in the labour market. As regards the decision to participate in the labour market, education has a positive effect for two reasons. Firstly, if education is considered as an investment then the woman has to work in order to recover that cost of investment in human capital. Secondly, if education is considered a consumption activity, the woman will be induced to work due to higher earning potential as the opportunity cost of not working in terms of forgone earnings increases. As regards the duration of work, education has a positive effect as it raises the earning capacity and increases the cost of not working. On the other hand, higher earnings mean that the income target is reached earlier, allowing the woman to allocate a part of the higher earning to consume leisure and work less. The net effect of education on female labour force participation depends on which force dominates. Empirical studies have shown that female labor supply responds more to wage considerations (substitution effect) than to income, so that participation of educated females is higher than that for the less educated or uneducated (Psacharopoulos and Tzannatos, 1989).

In rural areas, non-farm paid jobs available to those with little or no education are mainly casual wage labour, where there is little association between the years of education and wage levels. However, education raises the reservation wage for these women through an increase in the productivity of time spent on their own farm and home production, which results in lower participation in wage/paid employment if the local labour market does not provide better opportunities (Unni, 1994). This implies that women with some education may prefer to remain outside the labour market altogether, preferably doing household work or working on family farms as unpaid family labour in the absence of remunerative non-farm employment opportunities. A negative association between the level of education and female labour force/work participation in paid activities may thus be postulated in rural areas.

In the present analysis, the coefficient of education as measured by the number of years of schooling is negative but does not significantly affect female work participation rates in Model I. Since work participation in Model I includes both paid and unpaid activities, it is

plausible that the level of education may weakly determine women's participation in the workforce. In Model II, however, it is positive and statistically significant. The value of Exp (B) for EDUCATION in Model II is 1.129; i.e. with a one-year increase in the number of years of schooling, the participation of women in paid employment increases by a factor of 1.129 or 12.9 per cent. An implication of this finding is that though the level of education has a non-significant effect on the work participation decisions, both paid and unpaid of women, the level of education of women who are in paid employment is higher than those who are not. This also implies that women with a higher level of education are employed in non-farm jobs, as employment in agriculture is primarily as unpaid family labour. Hypothesis (5) which states that education enhances women's participation in the labour market is accepted with some modification as education has been found to be positively associated with women's participation in paid work.

The kinship system and the joint family are still prevalent in rural India. In joint families with a large number of family members, a dichotomy is visible between men's work and women's work, with males being involved in paid activities and females in domestic activities. On the other hand, women of working age in joint families are assisted in their domestic activities and child care by older women and other female members of the household (Reddy 1979), which in turn increases their participation in paid activities or agricultural activities on the family farm. In the study area, family structure (FAM_STR) is a dummy variable with the variable taking a value of 1 if the respondent belongs to a joint family and 0 otherwise. The coefficient for this dummy is negative and statistically significant for both models, indicating that a respondent who belongs to a joint family as compared to a nuclear family was less likely to be in the workforce. In Model I, the odds of participating in work for a respondent from a joint family decreased by a factor of 0.498 or 50.2 per cent, whereas in Model II, the odds decreased by a factor of 0.392 or 60.8 per cent. If there is a single earning member in a nuclear family generally the husband, the wife is likely to work alongside him to supplement family labour on the farm or supplement family income through participation in paid activities. This explains the higher participation in the workforce of women belonging to nuclear families.

The presence of children may have a negative effect on women's participation in economic activities (Chaykowski and Powell 1999). Younger children especially, i.e. children below the age of six, may cause women to spend more time in child care while the presence of older children may reduce their work burden. Cohen (1970) observed that the presence of a child under the age of six was the most significant factor that determined labour

force participation of married women (cited in Anderson and Dimon 1998). In rural areas the presence of young children may not pose much of a problem for women's participation in agricultural activities, as older female children and female members of the household help with domestic work and child care while older male children assist in some agricultural activities. However, the spread of primary and secondary education has meant that school-going children cannot help in child care and household work as before.

As mentioned above, in nuclear families the presence of small children, particularly below the age of six, may hinder a woman's participation in economic activities. In the present study, the presence of children below the age of six was represented by the dummy variable CHILD_06, with the presence of one or more children below the age of six in the household being denoted by 1 and their absence by 0. In Model I, the presence of children under six years has a negative effect on female participation rates, but the results are not statistically significant. In Model II however, the variable has a significant negative effect. The results indicate that for women with children less than six years of age, the odds of participating in paid work decreased by a factor of 0.115 or 88.5 per cent. Since paid work involves working away from the vicinity of the household as opposed to unpaid work on family farms, taking care of young children may hinder women's participation in paid work. The marital status of the respondent was another major influence on female labour force participation, as married women had larger household responsibilities than women who were not married (Mon 2000) which restricted their participation in the labour force. Being married influenced women's decision-making ability and also increased the value of non-market activities. In patriarchal family structures, women were expected to fulfill the role of mothers and home-makers, and men the role of breadwinners and heads of the household (Blau *et al.* 1998, p. 13 cited in Lisaniler and Bhatti 2005). Since such patriarchal family structures are widely prevalent in Indian society, marriage is expected to reduce the participation of women in labour market activities. We grouped the respondents into two categories: those currently married and those who were single/widowed/divorced/separated. The variable of marital status (MARITAL_STATUS) is a dummy with single/widowed/divorced/separated being the reference category. The results of the analysis show that for Model I, although the coefficient is positive, it is non-significant. For Model II the coefficient is negative, implying that women in the single/widowed/divorced/separated category participated more in paid employment but this is insignificant.

The decision of women to participate in the workforce is also influenced by the work status of their husbands. Women are more likely to work for cash if their husbands have no

source of income, and are more likely to work as unpaid family workers in the family business if their husbands are self-employed (Donahoe, 1999). Nam (1991) found that in households where the male head was self-employed in the tertiary sector, or was employed as a family worker, or was unemployed, married women's likelihood of participating in the labour market was two to three times more as compared to women from families with a higher social status controlling for age, number of children under 6 and marital status. Women from household where the heads were blue-collar wage workers had low female labour force participation (Nam, 1991). In our analysis, the primary occupation of the head of the household whether agricultural or non-agricultural, was considered a determinant of female work participation. The dummy variable (OCCUPATION_HEAD) took a value of 1 if the primary occupation was agriculture and 0 if it was non-agriculture. For Model I, the occupation of the head of the household is significant in explaining the work participation of the respondents, with the odds of a respondent participating in the workforce increasing by a factor of 2.566 if the occupation of the household head is agriculture. This implies that the odds of being in the workforce for women in agricultural households increases by almost three times, as against women in non-agricultural households. These results corroborate the findings outlined in the previous chapter regarding the significant role played by women in agricultural activities. For Model II, the variable OCCUPATION_HEAD although negative, does not have a significant effect on women's work participation.

Male migration has been significant in rural areas, particularly in the hill and mountain areas from where men have moved to lowland areas in search of better employment opportunities. This leads to women's heavier work burden and increases their drudgery as they now need to perform those tasks which were previously performed by men (Pande, 1996). A study of labour out-migration in households engaged in rice-farming in three districts of eastern Uttar Pradesh also reports an increase in the workload of women in nuclear households in the absence of males with women taking over many male-specific activities in rice farming. The study also notes that although women's decision-making capacity has increased due to migration of males, their work is hindered since they lack access to modern seed technology (Paris, Singh, Luis, and Hossain, 2005).

The impact of male migration on the labour market behaviour of women, however, is ambiguous. A theoretical model developed by Lokshin and Glinskaya (2009) predicts that male migration could have two effects on female labour market participation. First, as household income increases due to remittances it could lead to a decline in labour market participation of women. Secondly, women's productivity at home could increase or decrease

depending on the properties of the home production function, with effect on labour market participation being ambiguous. The overall effect on women's participation is therefore the result of the interaction of these factors.

To understand the effect of male migration on female work participation, the presence of a male migrant (MIGRANT) has been included in the present model as a dummy variable, with respondents in households with at least one male migrant being coded as 1 and households with no male migrants as 0. Though the presence of male migrants affects female work participation inversely in both models, it is not significant. The non-significant effect of MIGRANT in Model I is plausible, where both paid and unpaid activities of females have been considered. Irrespective of the presence of a male migrant women in rural households participate in paid as well as unpaid activities. In Model II women in households with at least one male migrant are less likely to participate in paid activities as household income may increase as a result of remittances (Lokshin and Glinskaya 2009). Women may also be forced to stay at home to perform household chores that were earlier performed by men, thus increasing their participation in unpaid domestic activities and leaving less time for participation in paid activities. This is contrary to the belief that male migration increases the participation of women in the workforce. Therefore hypothesis (4) that male out-migration has increased the work participation of hill women can thus be rejected in the present study.

Family income has been noted as an important determinant of female work participation. Nayyar (1987) writes that according to several scholars poverty has been regarded as "the single most important factor" which has an influence on participation rates for women and "cuts across regions, religions, age, and time." Low levels of earnings among males induce females to participate in economic activities to supplement family income, a phenomenon referred to as the "additional worker effect" (Reddy 1979). Alternatively, the participation of women in the labour market leads to an increase in total family income thereby postulating a positive relation between female labour force participation and total household income.

To avoid endogeneity in the present study, household income was approximated by using monthly per capita consumption expenditure (MPCE) as a proxy for family income. Compared to estimated income, estimated household expenditure is considered to be a better indicator of living standards particularly in household surveys conducted in developing countries (Mailu, Maritim, Yabann and Muhammed, n. d.). The univariate analysis for household MPCE was statistically insignificant in both models. This implies that women in rural areas irrespective of the level of expenditure or income participate in economic

activities, both paid and unpaid. Therefore, the hypothesis (6) that labour force/work participation of women is relatively higher in case of low income families is not supported by the results of the study.

Land is not only a vital asset in agricultural families but also an indicator of socio-economic status. Some micro studies have established a negative correlation between landlessness and female participation rates in rural areas in India. Given that landlessness is regarded as an indicator of poverty in rural areas, it appears logical that women in the landless category participate more in economic activities to supplement family income than women with land (Nayyar, 1987). Some studies however, find a positive relationship between women's work participation in agriculture and the size of landholding (Bhati and Singh, 1987). In our study we have measured the landholdings of households (LAND) in acres. The results according to the univariate analysis, indicate a non-significant relation between the size of landholding and female work participation and were thus not included in the logistic regression exercise. Since the study considers paid as well as unpaid work, land does not appear statistically significant as women in families with small or large holdings may be employed as unpaid labour on the family farm. Low prevalence of agricultural labour, and less stringent class and caste distinctions in the hill areas (relative to the plains) may also help explain the non-significant effect of land on women's paid and unpaid labour on family farms. In Model II however, the size of land owned by the family is statistically significant in explaining women's work participation in paid activities. The odds of a respondent participating in paid employment decreased by a factor of 0.470 or 53 per cent for every one-acre increase in land owned by the household. This can be attributed to the fact that smaller landholdings mean lower income from agriculture, inducing women to search for paid employment outside the household, in agriculture or non-agriculture (Rai and Mukherjee, 2018).

6.7. CONCLUSION

Our analysis shows that women's employment in the rural hill regions of West Bengal is characterised by a predominance of unpaid work as family labour in agriculture. While 71.9 per cent of working-age women in the study were employed in paid as well as unpaid employment only 14.5 per cent reported active participation in paid employment. This highlights the crucial role that women in the rural hill economy play through their involvement in unpaid farm employment and allied work which contributes significantly to household food and economic security.

The findings of the study show that the age of women has a non-linear effect on their participation in economic activities (paid as well as unpaid work). However, age does not show a significant effect on women's work decisions if we consider only paid work. This implies that younger women – on account of child-bearing and child-rearing activities and other household work – and older women may not participate in economic activities as much as middle-aged women.

The results of the study also indicate the significant positive effect of education on women's involvement in paid work. Women with higher levels of education preferred to take up jobs outside the agricultural sector, either in self-employment or wage employment. Self-employment in the region included petty trade, such as running a shop in the vicinity of the household, while wage employment included teaching, working as an ICDS helper, a mid-day meal cook or in a government office. Wage employment in agriculture was not common due to the prevalence of the labour exchange system of '*parma*'. Hypothesis (5) which states that education enhances women's participation in the labour market is accepted with some modification as education has been found to be positively associated with women's participation in paid work.

The structure of the family was also an important determinant of women's labour market behaviour, with women in nuclear families showing higher participation as compared to women in joint families. The presence of a single male breadwinner and the desire to augment family income in order to improve living standards may be contributing factors for higher work participation of women in nuclear families. This suggests a higher work burden for women in nuclear families where there is very little sharing of domestic responsibilities. The study also shows that the presence of children under the age of six lowered women's participation in paid work. The marital status of women was insignificant in determining women's involvement in economic activities in both models, although women's marital status and women's work participation had an inverse relation in the two models.

The presence of a male migrant in the family and the per capita consumption level of the household, a proxy for household income, had no significant effect on the work participation of women in the study. This is in contrast to studies that report higher female participation due to male out-migration. Therefore hypothesis (4) that male out-migration has increased the work participation of hill women can be rejected in the present study. The study also rejects hypothesis (6) that labour force/work participation of women is relatively higher in case of low income families since it is not supported by the results of the study. Finally, size of landholding was found to influence women's participation in paid activities in the

study area, with women in households with smaller landholdings showing a higher likelihood of participating in paid activities.

Since women in the rural hill region make significant contributions to family farms as unpaid labour, it is important to recognise their contributions through a proper valuation of their services. Recognising women as farmers and increasing their skills through training and education along with provision of extension services would help improve the position of women involved in farm activities. Diversification towards non-traditional agricultural activities such as horticulture, apiculture, pisciculture etc. would also help augment family income and improve rural well-being. Further, new jobs in the non-farm sector can increase the participation of women in paid work. Opportunities for self-employment in various farm and non-farm activities can also be explored such as processing of dairy products, pickling, production of jams and juices, handicrafts, and eco-tourism. Since higher levels of education induce women to take up paid work outside agriculture, increasing the level of women's education would lead to women's increased participation in paid work. The limiting effect of fertility on women's paid employment can be offset through provision of child-care facilities at work. Policy measures directed towards employment generation in the region should focus on women's employment for their empowerment and reduction in gender inequalities in the larger interest of the region and the nation.

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Chapter VII

Women's Participation in Agriculture in the Study Area-Determinants, Contributions and Constraints

7.1. INTRODUCTION

Agriculture has been regarded as a fundamental instrument for sustainable development and poverty reduction in the 21st century. It has been estimated that three out of every four people in developing countries live in rural areas and most depend on agriculture for their livelihoods directly or indirectly (World Bank, 2007, p.1). Agricultural growth has also been found to have a direct impact on poverty eradication, health and nutrition of rural masses, national security and multiplier effect on entire economy (Dutt and Sundaram, 2009, p. 486). Despite tremendous progress in science and technology, agriculture together with the allied sectors is undoubtedly still the largest sector providing livelihood to the majority of India's population with more than 60 percent of total rural workers being engaged as cultivators or agricultural labourers as per the Census 2011. Although its economic contribution to India's GDP has been declining over the years, the agricultural sector nevertheless plays a very significant role in the country's socio-economic milieu.

Women have traditionally played an important role in agriculture as farmers, co-farmers, family labour, wage labour and as managers of farms, with their role extending beyond crop production to activities such as horticulture, livestock and fisheries even as the image of an Indian farmer is primarily male (Krishnaraj and Kanchi, 2008 p.1). Even though women put in long hours of work in agricultural households particularly if domestic work is also included, agricultural policies fail to recognise them as farmers which adversely affect their productivity. The non-recognition of women as farmers is an outcome of their lack of land ownership. Barring a few communities, the customary inheritance systems related to land ownership are patrilineal in most South Asian communities and women had few and highly restricted rights in land (Agarwal, 1994, p.84). This lack of land titles stands in the way of women's access to and availability of other productive resources such as loans and other financial services as well as extension services which contribute to the under-performance of the agricultural sector in most countries. "The history of women's land rights in South Asia has been and will continue to be a history of contestation and struggle at every level - legal, administrative, social, and ideological" (*ibid*, p. 468).

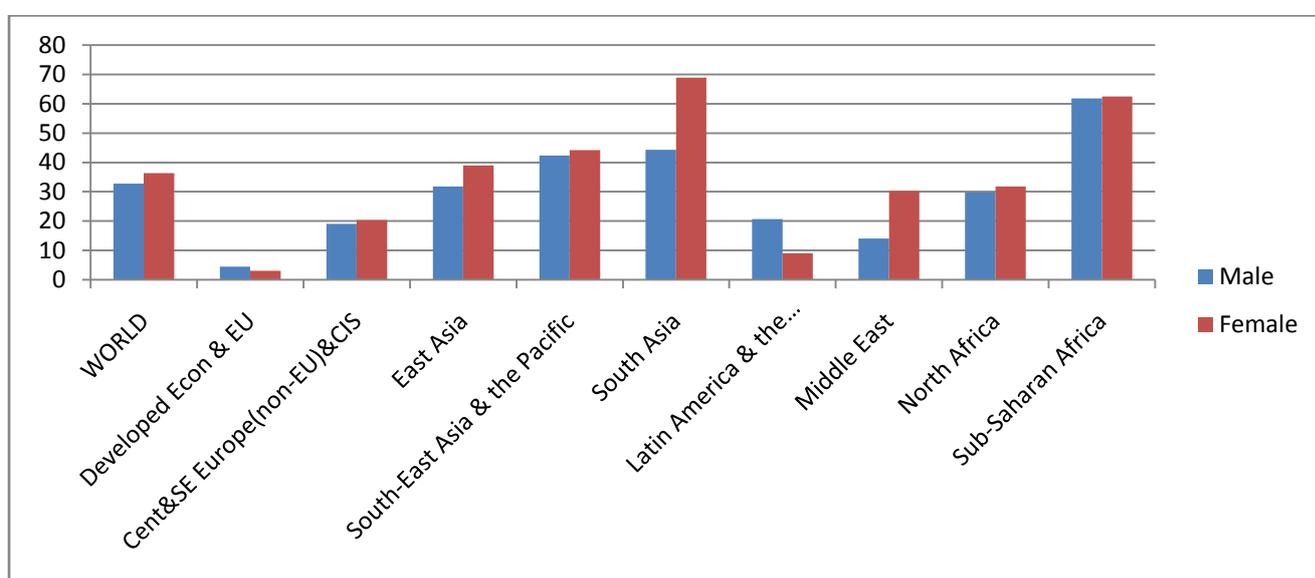
In many rural areas, the out migration of men and other changes in the farming system due to global climate change or government regulations have led to an increase in rural women's burdens. In hill and mountain regions which are characterised by a high level of male out migration, women's role in maintaining livelihoods through their increased involvement in farming and domestic activities along with providing care for those left behind turns out to be of critical importance. Division of labour in farming and related activities is found to be less strict in the uplands vis-a-vis the lowlands with women partaking in almost all activities. The depletion of forest and water resources due to environmental degradation coupled with stringent government controls often force women to travel longer distances in search of water, fuel wood, fodder etc. adding to their work burden.

Although women make crucial contributions to rural livelihoods through their involvement in agriculture and allied activities along with household chores, their contributions are rarely acknowledged as most of the work they perform blends with household activities which are considered to be a woman's responsibility and duty. Gender issues are hardly ever included in government programmes and policies. Gender ideologies regarding men's and women's roles tend to perpetuate the gender gaps in access to productive resources such as land, credit, extension services, education, information etc. with women occupying the lower rungs of the social ladder.

The purpose of the present chapter is to provide an account of the women's participation in agriculture in the study area. In doing so, the study initially carries out an econometric analysis of the field survey data to identify the different factors that influence the women's participation in agriculture measured by the amount of time spent by them in agriculture. Since agriculture is a home-based activity most of the women in the study area have been found to be involved in it either in principal or subsidiary status making them a part of the labour force. A multiple regression analysis has been undertaken to determine the factors influencing the time spent by the women in agriculture. Thereafter, the study attempts to provide an idea about women's contributions to household food security through their participation in crop production, animal husbandry and domestic activities. The focus of the next section is on highlighting women's access to productive assets which may act as a hindrance to their productivity and efficiency in performing agricultural activities. To conclude, the study looks at a few case studies of women in the study area to have a deeper and closer understanding of the situation of women and their work contributions, paid as well as unpaid and the constraints which they face.

7.2. WOMEN'S CONTRIBUTION TO AGRICULTURE

In 2012 at the global level, while 32.8 % of men were employed in agriculture, among women the percentage was 36.4 % as depicted in the Figure 7.1 (ILO, 2012). It can also be seen that with the exception of the Developed Economies and the European Union, and the Latin America and the Caribbean, the percentages are higher for the females in contrast to that for the males. Highest percentage share of women in agriculture can be found in South Asia (68.9 %) followed by Sub-Saharan Africa (62.5 %). Low involvement of women in agriculture is observed in Latin America and the Caribbean (9 %) and the Developed Economies and the European Union (3 %).



Source: ILO, Trends Econometric Models, July 2012.

Figure 7.1: Percentage Share of Employment in Agriculture, 2012

The Food and Agriculture Organisation (FAO) reported that in 2010 in Southern Asia 60.4 % of the economically active females were involved in agriculture, the percentage for India being 61.8 among the South Asian countries (FAO, 2011, p. 106). Women's participation in self-employment in agriculture varies across regions with men and women working equally in Africa, Europe and Central Asia, and some East Asian countries. In countries such as Mozambique, Rwanda, Uganda and Egypt women are more likely to participate in self-employment in agriculture in contrast to countries in Latin America and South Asia although in these countries and in Africa, women's involvement in agricultural production has deepened in recent decades (World Bank, 2007, pp. 78-79). In India, while 49.9% of total male workers are engaged in the agricultural sector, the percentage of female workers

engaged in agricultural activities turns out to be 65.1% according to Census 2011. In the state of West Bengal, the percentages of male and female workers in agriculture are 44.7 % and 41.7% respectively. For the Darjeeling hill region of the state, 36.7% and 37.3% of male and female workers respectively were found to be engaged in agriculture according to Census 2011 (Census, 2011). Although a significant proportion of the labour required for agricultural production is provided by women, the figures for the participation of women in the agricultural sector may be underreported in most official estimates due to the fact that most women are involved as unpaid labour on family farms and tend to report themselves as housewives rather than as agricultural workers. Further, agricultural production takes into account only field work and ignores activities such as kitchen gardening, production and maintenance of small animal and post-harvest storage and processing which are usually a woman's domain (Deere, 2005 cited in Cornhiel, 2006). Women working in agriculture were also more likely to be working as unpaid family labour; or seasonal casual labourers; or unemployed; and earning less for the same type of tasks as compared to men (Dixon, 1982).

7.3. IMPACT OF SOCIO-ECONOMIC AND DEMOGRAPHIC FACTORS ON WOMEN'S INVOLVEMENT IN AGRICULTURE-A MULTIPLE REGRESSION EXERCISE

In this section the study attempts to examine the impact of socio-economic and demographic variables on the extent of women's participation in agriculture measured by the time spent in agriculture. For this purpose an econometric analysis has been undertaken using the multiple regression model with the time spent in agriculture by the women as the dependent variable and various socio-economic and demographic variables as the independent variables. The data has been analyzed using the Statistical Package for Social Science (SPSS) version 23.

7.3.1. Model Specification

Regression analysis deals with the study of the dependence of one variable known as the dependent or outcome variable, on the values of one or more other variables known as the independent or explanatory variables, in order to estimate and/or predict the average value of the former in terms of the known or fixed (in repeated sampling) values of the latter (Gujarati, 2004, p.18). Regression analysis is widely used in economics and social sciences for empirical estimation since several explanatory variables can be included in it which helps to improve the fit of the model. The multiple regression model can be used to identify the independent effects of a set of variables on the dependent variable which is an important advantage of the model (Greene, 2002, p. 9). The fundamental model of the multiple

regression analysis postulates a linear relationship between the dependent (outcome) variable which is continuous and a set of independent variables (predictors) which may be continuous or categorical, and error. Thus, for an outcome variable Y , and k number of predictor variables X_1, \dots, X_k , the multiple regression model may be written as

$$Y_i = \beta_0 + \beta_1 X_{i1} + \beta_2 X_{i2} + \dots + \beta_k X_{ik} + u_i$$

Where β_0 is the Y-intercept (i.e. the expected value of Y when all X 's are set to 0), β_j s are multiple (partial) regression coefficients and u_i is the random disturbance. The disturbance can occur due to several reasons, primarily because it may not always be possible to quantify every influence on the dependent variable no matter how elaborate the model (*ibid*, p. 8). There are many factors leading to the disturbance in an empirical model, the most significant being the errors of measurement. The observed value of Y_i is thus the sum of the deterministic part and the random part. The multiple regression analysis aims at estimating the unknown parameters of the model, studying and testing the validity of the theoretical propositions and using the model for prediction of the value of the dependent variable (*ibid*, p. 8). The regression coefficients i.e. β_j s also known as the partial regression or partial slope coefficients measure the change in the mean value of Y per unit change in one particular explanatory variable holding other explanatory variables constant. For instance, β_1 measures the direct or net effect of a unit change in X_1 on the mean value of Y , net of any effect other X s may have on the mean value of Y (Gujarati, 2004, pp. 205-206).

7.3.2. Variables Used in the Model

Based on the review of literature, the variables chosen as explanatory variables in the multiple regression analysis are shown in Table 7.1.

7.3.3. Assumptions of Linear Regression

The method of ordinary least squares is commonly used to estimate the parameters in the multiple regression analysis. The random disturbance term u_i is assumed to be normally distributed with zero mean value i.e. $E(u_i) = 0$ and they have a constant variance i.e. $E(u_i) = \sigma^2$ for all i . The assumption of constant variance is also known as homoscedasticity. Further, it is also assumed that there is no auto correlation between the disturbances i.e $E(u_i u_j) = 0$ for all $i \neq j$ and there is zero covariance between the disturbance term and the predictors i.e. $E(u_i X_i) = 0$ for any i and j .

A problem commonly encountered in linear regression models is that of multicollinearity. Multicollinearity is a situation where two or more explanatory variables are highly correlated. It leads to large standard errors which causes inaccuracy in the estimation

of the coefficients. In the presence of perfect multicollinearity the regression coefficients of the X variables are indeterminate and their standard errors are infinite (*ibid*, p.344). However, since economic variables will almost always have some correlation among each other, the question is not presence or absence of multicollinearity but the degree of it. High R squared value with few significant *t* ratios is a classic symptom of multicollinearity.

Table 7.1: Variables Used in the Model (Multiple Regression)

Variables	Notation	Description
Dependent Variable		
Female Time in Agriculture	TIME_AGRI	Average time spent by a woman in agriculture in hours per day
Independent Variables		
Age	AGE	Number of years completed
Age Squared	AGE_SQU	Square of the number of years completed
Education	EDUCATION	Number of years of schooling
Number of Children below the age of six years	CHILD_06	Dummy Variable =1 if child below the age of six years is present = 0 otherwise
Woman's Marital Status	MARITAL_STATUS	Dummy variable=1 if Currently Married =0 otherwise
Primary Occupation of Household Head	OCCUPATION_HEAD	Dummy Variable=1 if primary occupation is agriculture =0 otherwise
Presence of Male Migrant Member	MIGRANT	Dummy Variable=1 if migrant male member is present =0 otherwise
Monthly Per Capita Consumption Expenditure	MPCE	Monthly per capita consumption expenditure of the household in Rupees 1,000 used as a proxy for household income
Land Holding	LAND	Ownership holding of the household in acres
Family Structure	FAMILY_STRUCTURE	Dummy Variable =1 Joint = 0 Unitary
Male Time in Agriculture	TIME_MALES	Average time spent by a male in agriculture in hours per day

High pair-wise correlation among regressors, usually in excess of 0.8 is another criteria used for detection of multicollinearity although multicollinearity can exist even for low values (less than 0.50) of the zero-order or simple correlations (*ibid*, p. 359). Other information such as Variance Inflation Factor (VIF), Tolerance, Eigen values, Condition Index may also be used to detect the presence of multicollinearity. As a rule of thumb, if the VIF of a variable exceeds 10, (*ibid*, p. 362) or if tolerance is less than 0.1 or below (Midi et. al., 2010) it indicates presence of multicollinearity. Conventionally, an Eigen value close to zero (say less than .01) or condition number greater than 30 indicates significant multicollinearity (*ibid*). To

detect the presence of multicollinearity among the regressors a correlation matrix has been constructed (Table 7.2). Though small positive or negative correlation has been observed among the regressors the correlation coefficients are below 0.8 thus ruling out multicollinearity. The values for the Tolerance, VIF, Eigen Value and Condition Indices shown in Appendix C are also well within the cut off range to rule out multicollinearity among the predictors.

Table 7.2: Correlation Matrix among the Explanatory Variables for Time Spent by Women in Agriculture

	X ₁	X ₂	X ₃	X ₄	X ₅	X ₆	X ₇	X ₈	X ₉	X ₁₀	X ₁₁
X ₁	1.000										
X ₂	0.283	1.000									
X ₃	-0.430	-0.213	1.000								
X ₄	0.028	0.210	0.068	1.000							
X ₅	0.176	-0.179	-0.010	-0.068	1.000						
X ₆	0.047	-0.143	0.074	-0.054	-0.034	1.000					
X ₇	-0.031	0.113	-0.065	0.076	0.033	-0.145	1.000				
X ₈	0.056	0.077	0.059	0.032	-0.001	-0.072	-0.031	1.000			
X ₉	-0.013	-0.024	0.136	0.167	-0.046	0.266	0.011	0.132	1.000		
X ₁₀	-0.003	0.107	0.047	0.160	0.035	0.196	0.063	-0.255	0.385	1.000	
X ₁₁	-0.344	-0.029	0.177	0.051	0.108	-0.078	0.113	-0.093	-0.130	-0.118	1.000

X₁-AGE, X₂-AGE_SQU, X₃-EDUCATION, X₄-FAMILY_STR, X₅-MARITAL_STATUS, X₆-OCCUPATION_HEAD, X₇-MIGRANT, X₈-MPCE, X₉-LAND, X₁₀-TIME_MALES, X₁₁- CHILD_06

7.3.4. Goodness of Fit

Before reporting and interpreting the results of the multiple regression analysis it is important to report the goodness of fit of the regression model. The multiple coefficient of determination denoted by R Square and the Adjusted R Square measure the goodness of fit of the regression equation; that is, they tell us about the proportion or percentage of the total variation in the dependent variable Y explained by the independent variables i.e. the Xs.

Table 7.3: Multiple Coefficient of Determination

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.562 ^a	.315	.282	1.37719	1.953

a. Predictors: (Constant), MPCE, MARITAL_STATUS, MIGRANT, EDUCATION, FAM_STR, OCCUPATION_HEAD, CHILD_06, AGE_SQU, LAND, TIME_MALES, AGE

b. Dependent Variable: TIME_AGRI

In the present model the Adjusted R Square value as shown in Table 7.3 tells us that 28.2 percent of the variation in the dependent variable is accounted for by the set of predictor variables included in the model. However, low R-squareds in regression equations are not uncommon in the social sciences, especially for cross-sectional analysis (Woolridge, 2013) since it may not be possible to quantify all possible influences on the dependent variable, in this case the time spent by the women in agriculture. Further, as mentioned by Moksony (1990) if the main objective of the study is a test of theory and not prediction, then low value of R-squared is of little relevance since it is not possible to prepare a full list of the various causes of a phenomenon (Moksony, 1990).

7.3.5. Results of ANOVA

The overall significance of the model is shown in the ANOVA table (Table 7.4). The F-statistic in the ANOVA measures whether all the independent variables taken together affect the dependent variable or not. It tests the null hypothesis ($H_0: \beta_1 = \beta_2 = \beta_3 = \dots = \beta_k = 0$) i.e. all slope coefficients are simultaneously zero versus the alternative hypothesis ($H_A: \beta_1 = \beta_2 = \beta_3 = \dots = \beta_k \neq 0$) i.e. not all slope coefficients are simultaneously zero. A significant F-statistic means that the H_0 can be rejected (Gujarati, 2004, p. 257). The results of the ANOVA show a statistically significant F-statistic ($p < 0.001$) which indicates that the null hypothesis can be rejected and the alternative hypothesis accepted.

Table 7.4: ANOVA

Model		Sum of	df	Mean	F	Sig.
1	Regression	194.834	11	17.712	9.339	.000 ^b
	Residual	422.955	223	1.897		
	Total	617.789	234			

a. Dependent Variable: TIME_AGRI

b. Predictors: (Constant), MPCE, MARITAL_STATUS, MIGRANT, EDUCATION, FAM_STR, OCCUPATION_HEAD, CHILD_06, AGE_SQU, LAND, TIME_MALES, AGE

7.3.6. Results and Interpretation

Before presenting the results of the regression analysis, the summary statistics of the variables used is presented in Table 7.5. The average time spent by the women in agriculture is 3.24 hours. For the categorical explanatory variables, the means indicate the proportion of cases with value of the explanatory variable=1. For example, the mean of 0.54 for family structure implies that 54 percent of women in the sample belong to the joint family.

Table 7.5: Summary Statistics (N=235)

Variables	Mean	Std. Deviation
TIME_AGRI	3.24	1.62
AGE	38.15	11.11
EDUCATION	6.66	5.04
FAM_STR	0.54	0.50
CHILD_06	0.17	0.38
MARITAL_STATUS	0.76	0.43
OCCUPATION_HEAD	0.55	0.50
MIGRANT	0.22	0.41
MPCE	2.84	1.83
LAND	2.00	1.78
FAMILY_SIZE	5.29	1.76
TIME_MALES	5.46	4.50

7.3.7. Interpretation of Regression Coefficients

The results of the multiple regression analysis for the time spent by the women in agriculture are shown in Table 7.6 which reports the unstandardized regression coefficients and their standard errors along with the value of the t-statistic and the corresponding *p*-values or the significance.

Table 7.6: Results of Multiple Regression Analysis for Time Spent by Women in Agriculture

Independent Variables	Coefficients	Std. Error	Beta	t statistic	Significance
(Constant)	3.044	0.334		9.109	0.000*
AGE	0.033	0.010	0.227	3.232	0.001**
AGE_SQU	-0.003	0.001	-0.313	-4.903	0.000*
EDUCATION	-0.050	0.020	-0.156	-2.465	0.014**
FAM_STR	0.288	0.190	0.089	1.512	0.132
MARITAL_STATUS	0.442	0.228	0.117	1.940	0.054***
OCCUPATION_HEAD	0.642	0.196	0.197	3.277	0.001**
MIGRANT	-0.112	0.225	-0.028	-0.498	0.619
LAND	0.215	0.059	0.236	3.625	0.000*
TIME_MALES	-0.059	0.024	-0.163	-2.449	0.015**
CHILD_06	-0.215	0.278	-0.048	-0.772	0.441
MPCE	0.020	0.054	0.022	0.369	0.713

Dependent Variable: TIME_AGRI *significant at $\alpha=0.001$, **significant at $\alpha=0.050$, ***significant at $\alpha=0.100$

Among the eleven explanatory variables included in the analysis seven variables were found to be statistically significant in explaining the amount of time spent by the women in agriculture. The age squared (AGE_SQU) and the land holding of the household (LAND)

were found to be significant at $\alpha=0.001$; age (AGE), level of education (EDUCATION), primary occupation of the household head (OCCUPATION_HEAD) and the time spent by the males in the households in agriculture (TIME_MALES) were found to be significant at $\alpha=0.050$; and marital status (MARITAL_STATUS) of the female participants was found to be significant at $\alpha=0.100$.

The results of the multiple regression analysis indicate that age of the female participant (AGE) has a non-linear effect on the amount of the time spent in agriculture as indicated by the significant age squared term (AGE_SQU). The amount of time spent in agriculture increases with increase in age as indicated by the positive coefficient of AGE (0.033) up to a certain age, beyond which it declines as shown by the negative coefficient of AGE_SQU (-0.003). Women in the lower age group tend to spend less time in agricultural activities since they are burdened with housework and child care. Older women also tend to spend less time in agriculture since some agricultural activities like sowing, weeding, harvesting etc. involve physical labour and may therefore be engaged in light tasks like seed storing, sun drying, seed selection etc.

It has been argued by certain scholars that education is an important factor that boosts women's involvement in agriculture, as being educated increases women's ability to understand and assimilate useful information related to increasing agricultural productivity (Mtsor and Idisi, 2014). Verma (1992) mentions that one of the important factors that promotes growth and development in agriculture is education. In fact, Verma further states that since farming is an activity in which all the members of the family participate, educational level of all the family members is important for acquiring, comprehending and accepting information related to improved farming techniques (Verma, 1992, pp. 63-65). In recent times, education may be regarded as an essential input in agricultural modernisation and development in view of the increased "commercialisation of agriculture, crop diversification, introduction of new technologies and the imperative for better information processing" (Srivastava and Srivastava, 2010). Positive relation between the level of education of the participant and involvement in farming has been reported by several studies (Moktan and Mukhopadhey, 2012; Makepe and Oageng, 2012; Singh, Kushwah, Singh and Daipuria, 2015). In the present study however, the coefficient of education of the participant as measured by the number of years of schooling (EDUCATION) shows that increase in the number of years of schooling of the participant decreases the time spent in agriculture by 0.050 hours. This implies that women with higher levels of education spend less time in agriculture. The agriculture in the study is primarily for subsistence and is not very

remunerative. It also involves long hours of tedious and physical activities. For such reasons, women with higher levels of education may prefer to search for employment opportunities outside agriculture which explains the negative significant effect of education on the time spent in agriculture.

In farming communities, especially in India, family size is considered to be important given that farming requires extensive use of labour (Verma, 1992, p. 66). This is also one of the reasons for the prevalence of the joint family system in rural India (*ibid*). The joint family structure which is generally associated with more family members mean more helping hands, but at the same time it also means more domestic responsibilities for the women. Dichotomy between men's and women's work may also be observed in households with joint family structure. Work being shared among the family members, the time spent by women in agriculture may be lower in such families. Also more time commitments to household tasks like cooking, cleaning etc. may reduce the time spent in agriculture. On the other hand, large families also imply more requirements for food and cash income which may make it imperative for women to put in extra hours in agriculture along with the men. In the present case, the results of the regression analysis reveal that the structure of the family (FAMILY_STR) though having a positive coefficient is not significant in explaining the differences in time spent by women in agriculture. This could be explained by the fact that farming being a household activity all the members participate in it in some form or the other.

Women's marital status (MARITAL_STATUS) is measured by a dummy variable with 1 indicating currently married women and 0 the category which consists of unmarried/widowed/ separated/divorced. The variable MARITAL_STATUS turns out to be statistically significant in the regression analysis. As observed from the coefficient, being married increases the time spent by the participants in agriculture by 0.442 hours compared to the other category. Participation in agricultural activities is commonly considered as a part of household activities. Since women often combine agricultural activities with domestic duties married women may have a compulsion to participate in agricultural activities as opposed to those who are not married which leads to their higher participation. Marriage has also been found to have a positive impact on female labour force participation in the agricultural sector because as pointed out by Makepe and Oageng (2012), in contrast to unmarried women, those who are married usually have better access to assets such as land and credit facilities which enable them to participate more in agriculture. Further, married women often receive assistance and financial support from their husbands for carrying out various economic activities including agriculture (Makepe and Oageng, 2012). There are also greater challenges

for married women in participating in jobs outside home due to stronger taboos for married women which restrict their movement outside their homes (Kafle, 2015). As a consequence married women may be concentrated in agricultural activities which can be performed within the vicinity of the household. The other category comprising of unmarried/ widowed/ separated/divorced women may have older aged widows who may be putting in less time in agriculture. They may also be involved in activities in the non-farm sector.

The primary occupation of the head of the household (OCCUPATION_HEAD) has a significant positive impact on the time contributions of women in agriculture. Women belonging to agricultural households are found to spend 0.642 hours more in comparison to women belonging to other households. Since agriculture is a family based activity all the family members are involved in it in some form or another and to a greater or larger extent. In non-agricultural households, agricultural activity may primarily be for subsistence as such requires less labour input by women.

Migration of males in search of employment options is a common feature of mountain areas. From the summary statistics table it can be seen that 22 percent of the women in the sample belong to families with at least one male migrant. Male migration has led to increased work load of hill women who are left behind (Pande, 1996). In the present study however, the presence of a male migrant has a negative non-significant impact on the time contributions of women in agriculture. This is contrary to the hypothesis that male migration increases the time spent by women in agriculture. As theorized by Lokshin and Glinskaya (2009), the increase in household income from remittances due to migration could lead to a reduction in the labor market participation by women. In the study area it was observed that migration was higher in non-agricultural households vis-a-vis agricultural households. The higher income through participation of the male migrant in non-agriculture could entail the use of hired labour for lack of male members which lowers the time commitments of the female members in agriculture. Increased workload in household activities along with caring for children and older members of the family could also mean lower time expended in agriculture. Since agriculture may be primarily for subsistence and only a secondary source of income in such households, time requirements in agriculture may be lower than in agricultural households. Possession of land is a very significant factor in determining women's work particularly as farmers, with women belonging to families with bigger landholdings showing a higher probability of being engaged in agriculture as self-employed workers, and a lower probability of being engaged as casual agricultural wage workers (Srivastava and Srivastava, 2010). As mentioned earlier several other studies have also confirmed the positive relation between the

size of land holding and women's involvement in agriculture (Bhati and Singh, 1987; Thakur, 1991; Chowdhry, 1993; Moktan and Mukhopadhey, 2012) while others point to a decline in women's involvement with an increase in the size of the land holding (Nayyar, 1987). In the present study, the coefficient of land (LAND) has a significant positive impact on the time spent by women in agriculture with the time spent increasing by 0.215 hours for every 1 acre increase in the land holding. Large size of land naturally means more time spent by women in the various agricultural activities. Women in households with larger landholdings are agricultural families and their time inputs to agriculture would obviously be greater than those of women belonging to households with smaller landholdings as they work alongside the men folk in different activities related to crop production. Less stringent distinctions on the basis of class and caste regarding the type of agricultural work also helps explain the higher time commitments of women belonging to higher income families. The increase in women's participation in agriculture with increase in size of the land holdings is an important characteristic of hill agriculture as most of the work is done by family labour. In the lowland areas where the average land holdings are larger than in the hill areas, cultivation on large land holdings generally entails the use of hired labour- male, female or both. As a consequence, women's participation as family labour may show a decline with increase in size of holdings in the lowland areas.

“Family responsibilities, based on gender roles, have dictated the female working pattern in every country” (Maki, 1993) with men specialising in market and women in non-market activities. As mentioned in Chapter V, gender division of labour in agricultural activities has been observed only to a small extent in the study area, with men and women participating in almost all activities related to crop production. The time allocated to agriculture has however been found to vary between men and women. It has been observed that in households where the primary activity of the household head is agriculture the average time expended by men in agriculture is higher than that of women. Conversely, in households where the primary activity of the household head is non-agriculture, women on an average, have been observed to spend more time in agriculture vis-a-vis men. This is an indication of the dichotomy in men's and women's work time wherein, the labour inputs of men tend to be higher where production is market oriented i.e. in agricultural households; and women's labour inputs tend to be higher where production is primarily for subsistence i.e. in non-agricultural households. In the present study, the time spent by the male members of the household in agriculture has therefore been considered an important determinant of the time input of the women in agriculture. This variable has been found to be significant at $\alpha=0.050$

with an additional hour spent by the males in agriculture leading to a reduction in the time spent by the women by 0.059 hours. This is in conformity with the earlier observation that higher time inputs by males in agricultural households reduces women's time inputs in agriculture and lower time inputs by males in non-agricultural households leads to increased time spent by women in agriculture. It also points to the fact substantiated in literature on women's work that women's labour is considered to be subsidiary and a substitute for men's labour.

It can be assumed that presence of small children usually below the age of six years would reduce women's participation in agriculture since child bearing and rearing involves intensive time commitments. In the present study the coefficient of CHILD_06 though negative is insignificant in explaining the variations in time spent by women in agriculture. Although women can look after children while performing certain agricultural activities, the time committed to agriculture as a whole is less for women with smaller children as opposed to other women with no or older children which could help explain the negative value of the regression coefficient.

Income of the family is an important determinant of level of women's participation in agriculture as mentioned in several studies. Women from low income families are found to show a higher level of participation in contrast to women from high income families. Women belonging to low income groups show higher participation possibly to save labor cost and to earn their livelihood, whereas women from high income groups are prevented from attending to farm work due to class consciousness and status factors (Rekha, 2012). In the present study monthly per capita consumption expenditure (MPCE) has been used as a proxy for household income. The results of the study indicate that MPCE has a non-significant impact on the time expended by women in agriculture. In rural areas since agriculture is a way of life, women irrespective of household income participate in it as is confirmed by the results of the study. From the results of the regression analysis it may therefore be concluded that women's participation in agriculture is determined by the socio-economic and demographic characteristics. The life cycle effect of age on women's involvement in agriculture is clearly evident from the results of the study. Education of the women shows a negative association with the time spent by women in agriculture which highlights the fact that higher levels of education increases the aspirations for better paid jobs outside agriculture. The results of the study also indicate that currently married women tend to spend more time in agriculture as opposed to the others category. This implies that farming may still be considered a part of household activity which compels married women to invest more time in it. Women from

agricultural households and households having larger landholdings are also found to be showing higher time commitments to agriculture in the study area. The time spent by the women in agriculture has also been found to be inversely associated with the time spent by the male members of the households which implies that the female labour is a substitute to male labour. The structure of the family, presence of a male migrant, presence of children below the age of six years and the monthly per capita consumption expenditure of the household which is regarded as a proxy for household income are found to have non-significant effects on the time spent by women in agriculture. From the results of the study therefore, hypothesis (7) which postulates that women with larger land holdings spend more time in agriculture is accepted.

7.4. WOMEN'S CONTRIBUTION TO HOUSEHOLD FOOD SECURITY

Food security is said to exist “when all people, at all time, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life” (World Food Summit 1996, para. 1 cited in Asian Development Bank, 2013, p.5). Food security is built on three pillars: food availability which means being able to obtain adequate quantities of food on a consistent basis; food access which means having enough resources to obtain appropriate and nutritious food; and food use which means being able to use available food in an appropriate manner based on knowledge of basic nutrition and care, along with adequate water and sanitation (*ibid*).

Despite severe socio-cultural and economic constraints, across the globe rural women's role is indispensable in each of the components associated with food security right from production on the family farms, to preparation and distribution of food within the household. Besides their key role in crop production, women also play an equally pertinent role in tending of farm animals, maintaining poultry, fish farming etc. which all contribute to the food security of the households. Women's unpaid work is crucial for food security as it helps in maintenance of the agricultural workforce (Food and Agriculture Organisation (FAO), International Fund for Agricultural Development (IFAD) and International Labour Organisation (ILO), 2010, p.35 cited in Asian Development Bank, 2013, p.4). As part of household activities women are concerned with collection of fodder, fuel wood, water etc. which are all important elements of household food security. The Gender Tool Box Brief on Women and Food Security by Sida (2015) mentions that at community level women carry out a wide variety of activities, such as conservation of soil and water, afforestation and crop domestication all of which support natural resource management and agricultural

development. They often have unique perspectives and understanding of the importance of local biodiversity for the development of adapted and improved varieties and play a decisive role for dietary diversity. It has been found that women headed poor households are more successful in providing more nutritious food to their children as compared to households headed by men (Sida, 2015).

Sustainable food production is the first pillar of food security. Women the world over are actively involved in production of food through their roles as family labour, agricultural labour, farm managers etc. Women comprise an average of 43 percent of the agricultural labour force of developing countries and provide 85 to 90 percent of the time spent on preparation of food in the household (FAO, 2011). Through their role as farmers, farm workers and managers of natural resources women make significant contributions to agricultural production, maintenance of the environment and food security of the family (Quisumbing, Brown, Feldstein, Haddad, and Pena, 1995). The second pillar of food security is food accessibility which depends on the income of the household. Many studies point out that household welfare does not depend simply on the level of household income but also on the fact as to who earns that income, men or women since women's income as opposed to men's are found to be correlated to improvements in children's health and nutritional status (Quisumbing et.al., 1995, Ibnouf 2009). The third important pillar of food security is utilization. Since women are responsible for preparing food for the family their role in ensuring adequate nutritional status and dietary diversity of the household members is crucial. Besides good food, adequate health and child care along with clean water and good sanitation are also the prerequisite for achieving nutritional security which are entirely a woman's responsibility. A critical requirement for ensuring availability and use of the complementary inputs for providing nutritional security is time, investment in which is generally made by women (Quisumbing et.al., 1995). This brings to light the value of women's unpaid domestic work for provision of fuel and water in combination with caring for the household members for ensuring food security.

The issue of food security is closely connected with the issue of gender inequality. Discriminatory practices against girls and women due to social and cultural norms limit women's access to educational and employment opportunities which in turn restricts their economic autonomy and independence. Women's lower economic autonomy is reflected in their weaker bargaining position within the household which can lead to different feeding and care giving practices in favour of boys. This causes lower productivity and poorer health and nutritional outcomes for women (Asian Development Bank, 2013 pp.5). Women's role in

ensuring household food security is also overlooked especially in developing countries since rural women's problems and concerns are rarely taken into account at the national and global level (Achampong, Mensah, Aidoo, and Agyemang, 2012). As a consequence, women lack access to assets and resources such as land, credit, and extension services etc. which are crucial for boosting agricultural productivity. Further, women's time constraints and their limited mobility due largely to their reproductive and domestic responsibilities coupled with social and cultural norms largely hinder their active participation in agriculture and hence food security.

In the present study women's role in ensuring food security has been assessed through an analysis of women's role in crop production, animal husbandry and domestic activities which includes cooking, collection of fuel, water etc. For each village the number of women between the ages of 15-65 is considered who may or may not be participating in agricultural activities. Students who were attending educational institutions have been excluded from the analysis. For each activity related to crop production, animal husbandry and domestic activities the participation of the women were recorded as a "yes" or "no" response to obtain the number of women who were participating in the different activities. Women in the study area are actively involved in all the processes related to production of food. Their participation as unpaid labour on family farms contributes significantly to food security in the region. They also play an equally important role in animal husbandry i.e. maintaining bovines, goats, pigs, poultry etc., not to mention their involvement in domestic and household tasks all of which are important contributors to household food security.

Table 7.7 measures the participation of women in the different activities related to crop production which highlights their crucial role in ensuring household food security. From the table it can be seen that participation of women is higher in the following activities: sowing, transplanting/uprooting, weeding and harvesting and relatively lower in ploughing though there are differences in the three villages. While a little over fifty percent of women have been found to be participating in agricultural activities in Git Dubling Khasmahal and Sitong Khasmahal, the average participation of women in Samalbong village is about 48 percent. Taking all the three villages it can be seen that the average participation of women in activities related to crop production is 52.67 percent. Women's important role in agriculture, hence in ensuring food security in the study area can be gauged from their participation in almost all the activities related to crop production.

Table 7.7: Women's Participation in Crop Production

Village/ Activity	Samalbond (N=68)		Git Dubling Khasmahal (N=74)		Sitong Khasmahal (N=93)		Total (235)	
	No.	%	No.	%	No.	%	No.	%
Land preparation	22	32.35	29	39.19	30	32.26	81	34.47
Seed selection	34	50.00	29	39.19	12	12.90	75	31.91
Ploughing	18	26.47	9	12.16	27	29.03	54	22.98
Sowing	43	63.24	55	74.32	85	91.40	183	77.87
Transplanting/ Uprooting	38	55.88	63	85.14	85	91.40	186	79.15
Watering	45	66.18	12	16.22	54	58.06	111	47.23
Application of manure/ fertiliser	20	29.41	18	24.32	52	55.91	90	38.30
Weeding	40	58.82	60	81.08	80	86.02	180	76.60
Harvesting	55	80.88	67	90.54	90	96.77	212	90.21
Sun Drying	42	61.76	64	86.49	42	45.16	148	62.98
Grading and Storing	21	30.88	49	66.22	66	70.97	136	57.87
Seed Storing	35	51.47	46	62.16	10	10.75	91	38.72
Weighing	24	35.29	32	43.24	45	48.39	101	42.98
Marketing	22	32.35	35	47.30	28	30.11	85	36.17
Average Participation	33	48.21	41	54.83	50	54.22	124	52.67

Source: Field Survey

Apart from their significant role in crop production, women in the region show active participation in animal husbandry. The number and percentage of women who are involved in the different activities related to animal husbandry is shown in Table 7.8. Considering all the three villages it can be seen that 56 percent of the women participate in the different activities related to animal husbandry. Highest involvement of women can be seen in stall feeding, forage collection and taking care of animals, while relatively low participation can be seen in marketing of milk.

Women's contribution to household food security can also be gauged through their role in key domestic activities such as cooking, collection of fuel wood, water and care of the children and the elderly which is shown in Table 7.9. Almost all the women in the study villages were found to be involved in cooking (99 percent) and looking after the elderly and children (90 percent). Relatively lower participation was observed in fetching water (50 percent) as in some of the houses there was domestic water connection with no fetching of water required.

Table 7.8: Women's Participation in Animal Husbandry

Village/Activity	Samalbond (N=68)		Git Dubling Khasmahal (N=74)		Sitong Khasmahal (N=93)		Total (235)	
	No.	%	No.	%	No.	%	No.	%
Stall Feeding	59	86.76	71	95.95	77	82.80	207	88.09
Forage Collection	48	70.59	64	86.49	62	66.67	174	74.04
Milk Extraction	31	45.59	46	62.16	35	37.63	112	47.66
Cleaning Shed	37	54.41	43	58.11	60	64.52	140	59.57
Taking care of animals	45	66.18	53	71.62	51	54.84	149	63.40
Collecting Manure	34	50.00	43	58.11	53	56.99	130	55.32
Marketing of Milk	10	14.71	11	14.86	32	34.41	53	22.55
Purchasing feed	19	27.94	27	36.49	44	47.31	90	38.30
Average Participation	35	52.02	45	60.47	52	55.65	132	56.12

Source: Field Survey

Table 7.9: Women's Participation in Domestic Activities

Village/Activity	Samalbond (N=68)		Git Dubling Khasmahal (N=74)		Sitong Khasmahal (N=93)		Total (235)	
	No.	%	No.	%	No.	%	No.	%
Cooking	68	100.00	74	100.00	91	97.85	233	99.15
Fetching Water	41	60.29	34	45.95	43	46.24	118	50.21
Fuel Collection	53	77.94	59	79.73	56	60.22	168	71.49
Looking after children and elderly	67	98.53	69	93.24	76	81.72	212	90.21
Average Participation	57	84.19	59	79.73	67	71.51	183	77.77

Source: Field Survey

7.5. WOMEN'S ACCESS TO PRODUCTIVE RESOURCES

Having realised the crucial role of rural women in agriculture this section looks into women's access to productive assets which play a key role in determining agricultural productivity. Central to the process of rural development is the active participation and the collective action of both men and women. Women's contribution to agricultural hence rural development is highly significant through their role in agriculture, yet their participation is severely constrained by lack of access to and ownership of productive assets. The Food and Agriculture Organisation (FAO) points out that women farmers the world over, have less

access to productive resources such as land, modern inputs, technology, education and financial services all of which determine agricultural productivity (FAO, 2011, p. 23). Women's lack of access to productive assets has also been put forth by several micro level studies. Parveen's (2008) study of 159 farmers' wives in Bangladesh show that though the women had better opportunities for livestock rearing and availability of capital, they had limited access to extension services, technologies, training, institutions, land and other production inputs. The study further observed that women's access to productive resources was hindered by lack of technical knowledge and land ownership, household chores along with socio-cultural constraints like restricted mobility and resistance from males. Ibrahim and Ibrahim (2012) in their study of 100 women farmers in a rural area of northern Nigeria observed that in terms of inputs like land, seed and labour the respondents had better access but for rural institutions and capital the access was limited, the major constraints cited by the women farmers as limiting their productive activities being inadequate access to extension contact and credit facilities and high input cost. Paul and Meena's (2016) study of 100 farm families under integrated farming system in plain and hilly region of the state of Tripura in India reveal more access to resources by male farmers in comparison to female farmers and more access to and control over the resources by female farmers in case of hilly region compared to female farmers of plain region. Ownership and control over productive assets, especially by women have been found to have positive direct and indirect impacts on welfare of individuals and the household and society at large. It has been estimated that closing the gender gaps in agriculture regarding access to productive assets by women could increase yields on farms controlled by women by 20-30 percent which could raise total agricultural output in developing countries by 2.5-4 percent, and in turn reduce the global hunger by 12-17 percent (FAO, 2011, p. 5).

7.5.1. Case for Women's Control over Assets

“Within the livelihoods approaches”, assets have been defined as a “set of ‘capitals’ that include natural, physical, human, social and financial capitals, all of which jointly play a key role not just in poverty reduction, but also in reducing vulnerabilities to stresses and shocks” (Scoones, 1998 cited in Rao, 2005). In the context of the rural areas therefore, individual or household assets include land, livestock and labour; and community or state assets include common property such as forests, grazing land or water resources (marine and coastal), along with public infrastructure such as potable water, electricity and health care as major assets particularly for women since they reduce women's work burdens (*ibid*).

The fact that lack of access to and control over assets by women is detrimental to growth and development and is linked to women's lower status has been documented by several studies (Agarwal, 1994; Kelkar, 2011; FAO, 2011; Rustagi and Menon, 2011; Gamisonia, 2017). It has been demonstrated by analyses of feminist economists that even within the same household individuals' (especially women's) control of household assets are different which shows that economic inequality can accumulate over the lifetime of individuals leading to lower wages for women and preventing them from taking decisions for managing and innovating with assets with negative impacts on gender equality and women's empowerment (Kelkar, 2011). For women engaged in agriculture, gender gaps in access to land, farm labour, livestock, education, extension and financial services and technology have been observed in different countries which reduce the agricultural productivity of women and thus involve broader costs-economic and social (FAO, 2011 pp. 23, 36) with an adverse impact on women's economic well-being in the short run and their status in society and the household in the long run (Gamisonia, 2017). Lack of women's control over assets also leads to increasing dependence of women on the men folk which perpetuate their subordinate position in the household and society.

Access has been termed as the "right or opportunity to use, manage or control land or natural resources" along with "the ability to reach and make use of the resource" (Nichols, Ng'ang'a, Komjathy and Ericsson 2001). Among the different productive assets, land has been regarded as a primary asset especially in rural areas since possession of land is an important determinant of economic and social status and political power. Besides, arable land is a "productive, wealth-creating, and livelihood-sustaining asset" providing "a sense of identity and rootedness within the village" being highly durable and permanent as compared to other assets (Agarwal, 1994, p.17). In patriarchal social systems however, despite women's higher involvement in agriculture, elder men still retain ownership of land and control women's labour taking important decisions related to agriculture (Sachs, 1996). Agarwal (1994) observes that for most women in South Asia land rights are elusive with only some women owning land and even among those who own land very few are able to exercise control over it (Agarwal, 1994 p.2). Besides, even when women own land, the holdings are smaller than those operated or owned by men.

The FAO (2011) reports that in the countries of North Africa and West Asia for which data are available, women represent fewer than 5 percent of all agricultural holders. In the sub-Saharan Africa, the average is 15 percent with inter-country variations ranging from less than 5 percent in Mali to more than 30 percent in countries such as Botswana, Cape Verde

and Malawi. The highest regional average has been observed in Latin America which is greater than 25 percent in Chile, Ecuador and Panama. Severe inequalities in land access has been observed in countries such as Bangladesh, Ecuador and Pakistan, where male-headed households own more than twice the average size owned by female headed households (FAO, 2011 pp. 23). All these highlight the prominent gender gaps in land ownership and its control albeit in varying degrees the world over.

Agarwal (1994) argues for women's independent rights in arable land for achieving welfare, efficiency, equality, and empowerment (Agarwal, 1994 pp. 27). Besides increasing the quantity and quality of production, women's ownership and control over land also allows them to utilize household income for their improved well-being and that of the other household members along with a reduction in violence (Kelkar, 2011). Greater gender equality in land ownership could be a critical factor in strengthening the bargaining position of a woman within the household and the community with women owning even small plots of land in their own names gaining more respect in contrast to those who are landless (Agarwal, 1994, pp. 470-471). Surveys from South Asia have also noted that women's stronger voice in household decision-making was associated with their land ownership (Mason, 1998; Allendorf, 2007; Agarwal, 1998; 2002 cited in Rustagi and Menon, 2011). Women's access to and ownership of land is also linked to the access of other productive assets, like credit, fertilizers, extension services etc. Since title to land can provide collateral against credit; in the absence of land titles, most women in rural areas rely on informal sources for credit. It was observed that in India out of the many millions to whom Kisan Credit Cards (KCC) were issued hardly 5 percent were women (Swaminathan, 2005 cited in Kelkar, 2011). Rao's (2011) field study reveals that in Dumka district of Jharkhand although women and men had equal involvement in cultivation only 4 percent of KCCs were issued to women, while in Varanasi none of the women interviewed had KCCs (Rao, 2011). Evidence reveals that the credit markets are not gender-neutral with women often being rationed out of the credit markets by private and public lending institutions or being granted less loans in contrast to loans granted to men for similar purposes (Fletschner, 2009; World Bank, FAO and IFAD, 2009 cited in FAO, 2011, p.33). In this context it may be worth mentioning the role of microfinance institutions in bringing about major improvements in women's livelihoods by providing an important source of capital for women in rural households. The microfinance institutions have now become an "ubiquitous feature of women's livelihood programmes" having enhanced their entry into income-earning occupations like vegetable growing, poultry rearing etc. and have also led to their empowerment (Kelkar, 2005).

Livestock is another important asset in rural areas as they are a significant source of income especially in distress and as such provide resistance against shocks. Although women in rural areas play a significant role in animal husbandry, their control over livestock is very little and limited to small animals like goats, sheep, pigs and poultry while men own larger high value animals like cattle, horses, camel etc. (FAO, 2011). The FAO further notes that on an average, male headed households own larger livestock holdings and earn higher incomes from livestock vis-a-vis female headed households. It was observed in the rangelands in Africa that although women have the right to sell small quantities of livestock products such as milk and butter, they need prior permission from their husbands or other male members to sell animals (Radel and Coppock, 2013).

Access to training increases women's productive capabilities. However, access to training and extension services by women is limited. Women's lack of land ownership title is one of the reasons of the failure of development policies to recognise them as farmers in spite of women's significant labour inputs to farm work. Due to this, agricultural extension and information on new technologies are generally targeted towards men. Accepting women as farmers would lead to them being included for training as "farm managers, and not only as home managers" (Kelkar, 2011). Further, low levels of women's education also limit their participation in training programmes since their lower literacy levels makes it difficult for them to understand and incorporate the written information. Women's participation in extension programmes may also be limited by time constraints and socio-cultural reservations and their preoccupation with household responsibilities.

7.5.2. Women's Access to Resources in the Study Area

Since the productive assets in rural households are owned and used by all the members of a household, it is difficult to determine the proportion of assets held by the individual members. In the present study, due to limitations regarding empirical data women's access to productive assets have been considered with regard to the following assets-land, credit, savings, training and membership of social groups like self-help groups etc. Access to the different assets has been measured in the following manner:

- (i) Land- Access to land has been defined to include only land ownership either individually or jointly.
- (ii) Credit-Access to credit has been measured by considering the number of respondents who have been granted loans or micro-credit either individually or jointly through any formal or informal institutions.

(iii) Savings- The banking habits of the women in the study area can be assessed by considering the number of women who have a bank account or a post office account either individually or jointly.

(iv) Training- Access to training has been measured by the number of respondents who have participated in any training related to agriculture or allied activities.

(v) Social participation- Social participation has been measured through the number of women who are members of social groups like self-help groups etc.

For the analysis the number of working aged women between the ages of 15-65 has been considered for the three villages separately as well as collectively which gives a total sample size of 235. The total number and percentage of women who have access to the different productive assets in the study area as mentioned above have been shown in Table 7.10.

From Table 7.10 it can be seen that percentage of women having ownership of land in the study area is minuscule. Only about 5 percent of women in the study area have ownership of land either individually or jointly. In Sitong Khasmahal only two out of ninety-three women were found to have ownership of land. This is an indication of the gender gap in access to land. An important consequence of the lack of land ownership is the inability to obtain loans through formal institutions. Lack of land ownership was the most important reason cited by the women for not obtaining credit in their names through banks. Some of the women in the study area however had access to micro-credit through the self-help groups or some other voluntary groups of which they were members. Only 26 percent of women in the study area had loans granted in their names. Loans were availed for production, consumption, repairing of house, purchase of animals, education of children etc. Women's access to training as measured by the number of women who had attended at least one training programme in the past one year reveals that about 30 percent of women had attended training programmes organised by government agencies. The remaining were either unaware of any training programmes being organised or did not attend the programmes. The time constraint on account of household and farm work was a primary reason for women not being able to attend the training programmes. For some women, the male members of the family participated in the training programmes, some were unaware of the training programmes being organised while some others were not interested. Most of the participants who attended the training programmes expressed the need for more training programmes to be organised to obtain information related to better farming techniques for increasing the productivity. They also expressed the need for diversification and introduction of new varieties of vegetables and

fruits to augment farm incomes. About 54 percent of women in the study area were members of the self-help groups (SHGs). It was observed that at least one member from each household had membership of the SHGs. The members of the SHGs basically took up production activities i.e. farming on a plot of land and distributed the profits among the members. The members were also granted micro-credit for different purposes. Sometimes training programmes were also organised by the SHGs. As regards access to banking facilities, it was observed that almost 70 percent of women in the study area had an account in the bank or the post office which is an indication of development of banking habits and saving habits among the women in the study area.

Table 7.10: Women's Access to Productive Assets

Village	Number of Women	Land Ownership	Access to Credit	Access to Banking	Participation in Training	Social Participation
Samalbong	68	4 (5.88)	18 (26.47)	47 (69.11)	17 (25.00)	41 (60.29)
Git Dubling Khasmahal	74	5 (6.76)	16 (21.62)	53 (71.62)	28 (37.84)	38 (51.35)
Sitong Khasmahal	93	2 (2.15)	28 (30.11)	64 (68.82)	25 (26.88)	48 (51.61)
Total	235	11 (4.68)	62 (26.38)	164 (69.79)	70 (29.79)	127 (54.04)

Source: Field Survey. Figures in parentheses indicate percentages.

The findings of the study therefore reveal gender disparity in the access to land, credit and training facilities for women in the study area. The women however fare better in terms of social participation and banking and saving habits.

7.6. CASE STUDIES OF WOMEN IN RURAL AREAS IN THE DARJEELING AND HILL REGION

In the previous chapter an attempt has been made to identify the factors affecting the participation of women in the work force among the agricultural community in the hill regions of Darjeeling district of West Bengal. Since most of the women in the study area participate in agricultural activities both according to principal and subsidiary status, the first section of the present chapter has endeavoured to isolate the variables that may have an impact on the time spent by the women in agricultural activities. For a closer study and a deeper understanding of the rural women in the study area, a few cases of the women in the study area have been taken up in the following section for thorough study and analysis.

Case I-Bhagwati: A Female Cultivator: Bhagwati Pradhan a 50 year old unmarried female is a resident of Samalbong village of Sadar sub-division in Darjeeling. She lives with her parents aged 80 and 75 years respectively, her unmarried brother Anand Pradhan aged 40 years and her 19 year old nephew, Raj Kumar Pradhan.

Bhagwati's family is an agricultural family. Bhagwati along with her brother Anand are actively involved in farming activities along with the use of hired labour. The total land owned by the family is 3 acres. The land is owned jointly by Bhagwati, Anand and two of her brothers who live separately with their families close by; out of which Bhagwati and Anand cultivate 1.74 acres. The crops that are cultivated by the family include paddy, maize, pulses, potatoes, seasonal vegetables like beans, squash, tomatoes, red round chillies etc. While paddy, maize (used mainly as fodder for animals), pulses, potatoes and small quantities of seasonal vegetables are meant for self consumption, other seasonal vegetables like squash, beans, potatoes etc. are cultivated for sale in the market. Small quantities of rice and pulses are also sold in the local market.

Most of the work related to agriculture is carried out jointly by Bhagwati and her brother. During the sowing and harvesting periods when there is an increased requirement for farm labour, hired labour is used to assist in the different activities. At the same time the requirement for farm labour is also met through the labour exchange system of '*parma*' in which the members of the different households work alternately on each other's farms during the peak periods of sowing and transplanting. Gender division of labour in the agricultural activities was observed only in ploughing which was performed by the males and transplanting of rice which was carried out by the females. All other agricultural tasks were carried out jointly by the males and females. No gender division of labour was found in tasks related to tending of farm animals as all activities were performed jointly. Bhagwati's parents also participated in certain tasks like stall feeding, milking, cleaning the shed etc. Gender division of labour was however starkly visible in domestic activities like cooking, washing and cleaning etc. Most of the cooking for the family along with washing and cleaning was done by Bhagwati with little assistance from her mother. Fuel wood was purchased and some of it collected from the nearby forest. Bhagwati spends around 6-7 hours on an average daily in carrying out agricultural activities, while cooking, cleaning and other activities take up almost 3 hours. The total time that she devotes in a day for performing all activities is around 15 hours.

The annual household income is about Rs.1,00,000/- with the major portion of it being generated from agriculture. Other sources of income are through sale of milk, eggs and

poultry, farm animals, rural works programme like Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS), old age pension and occasional contribution from her nephew who drives a local taxi.

Since Bhagwati is actively involved in economic activities and contributes significantly to the household income she has a voice in most matters relating to farm and household affairs. She along with her brother makes most of the decisions related to agriculture and other household matters. Having land title, albeit jointly has probably improved her bargaining position within the household as her opinion is sought in key areas by her brother rather than taking decisions individually. She has also obtained loan from the bank for the purpose of purchasing a cow.

The major problem in agriculture as mentioned by Bhagwati is related to supply of water. The fields are irrigated using water from a nearby stream '*Khare khola*' which dries up or has very little water during the summer months. No other arrangement is available to make up for this water scarcity. Besides, pests and crop diseases have damaged certain crops like oranges, ginger etc. Low quality of seeds has also reduced productivity of certain crops. Although Bhagwati attends training related to agriculture time to time and finds the information imparted useful, she feels the need for more such training programmes to be organised which would impart knowledge regarding better methods of cultivating crops such as paddy, maize and other vegetables for improving their productivity.

Case II- Kumari: An Agricultural Labourer: Kumari Dutraj, 39 resides in Sitong Khasmahal village in Kurseong sub-division in Darjeeling district. The members in her family comprise her husband, 40 year old Bhanu Dutraj, three daughters aged 21, 16 and 14 and a son aged 11 years. Her eldest daughter Sunaina is unemployed and assists in household chores whereas the other children are all attending school. Kumari has not received any formal education and can only write her name.

The family does not own any land and lives on rented property. The family does not have a regular source of income. Most of the income is derived by working as casual labour in agriculture as well as in construction. Kumari's husband works as a casual labour in construction activities occasionally. However, he is out of job most of the time due to alcoholism and Kumari works hard to provide income for the family. Her husband's income is intermittent and insufficient to fulfill the family's requirements. Kumari therefore has an economic compulsion which leads to her participation in the labour market.

Kumari works as an agricultural labourer in others' farms during the peak season when there is a lot of agricultural activity. When demand for labour is high and family labour

is insufficient to carry out the different activities, households owning large areas of land may hire labour both males and females for carrying out some agricultural tasks. As an agricultural labourer Kumari is engaged in tasks such as clearing the field, sowing, harvesting, threshing, weeding, uprooting and washing carrots, radish etc. for which she gets Rs. 150-200/- per day. Agriculture being a seasonal activity, income derived from agriculture is not permanent and lasts only for a few months. As the income does not suffice a family of six members Kumari needs to look for other sources of income. During periods of low agricultural activity she works in the construction sector in the task of breaking stones which fetches her Rs. 100-150/- per day which is also not a regular source of income. Participating in rural works programme like the MGNREGS whenever available also adds to household income. At times she may also be employed in fodder collection, or to assist in domestic activities in certain households. The family also maintains two goats and a few poultry which can be sold off during the festivals and provides some source of income. It can be seen that Kumari is involved in multiple activities to ensure economic security for the family. Participation in multiple activities is an important strategy adopted by low income families in rural areas as a single source of income is inadequate to earn a living.

Household activities such as cooking, cleaning, washing etc. are carried out by Kumari and her daughter Sunaina. The younger children help in collecting fodder for the goats and in fetching firewood. Kumari's husband also collects fodder and firewood occasionally. At times she borrows money from her employers which is deducted from her salary. In terms of the time committed to the different activities Kumari spends 3-4 hours a day on household domestic activities and about 6-7 hours in other income generating activities which includes odd jobs in agriculture and construction. On an average she devotes 10-11 hours a day on different activities.

Kumari wishes that if she had better education she would have been able to secure a better job which would improve the living conditions of her family. Her children would attend private English medium schools and her eldest daughter would have been able to attend college. Kumari toils hard to make both ends meet as she desires that her children get proper education which will enable them to procure high paying government jobs and a secure future.

Skill development programmes in non-farm activities targeted especially at women would prove beneficial to women like Kumari who are landless and have little scope for employment in agriculture.

Case III- Nirmala: De Facto Female Headed Household Head: Nirmala Rai, 37 resides in Samalbong village in Sadar sub-division in Darjeeling. She is a mother of two children, Aruna 18 and Saideep 15. Aruna is presently studying in Class XII and Saideep in Class X. Her husband Gopal, 38 serves in the Indian army and is away for long periods. As such Nirmala heads the household and manages all the household affairs on her own. Nirmala has not obtained any formal education but is functionally literate and can maintain household accounts. The primary source of income for the household is the money remitted by her husband. Agricultural activity also contributes to the family income together with sale of milk and money received as house rent.

The family owns 1.5 acres of land out of which agricultural activity is carried out on 0.7 acres and teak saplings have been planted in another 0.7 acres. The crops that are grown include paddy, maize, pulses, potatoes and seasonal vegetables like radish, beans, tomatoes, onion, green leafy vegetables like '*rai saag*' etc. Most of the seasonal vegetables are marketed while paddy, pulses, potatoes and maize are primarily for self-consumption. There being no other adults in the household most of the agricultural activities are carried out by Nirmala herself. Her daughter helps her occasionally in activities like picking vegetables, storing grains, threshing, collecting fodder, cooking, cleaning and washing etc. Hired labour is employed during the peak season for activities like building embankments, clearing the field and ploughing, carrying manure, transplanting, harvesting paddy etc. Nirmala also maintains a cow and performs all the activities herself with some help from her children.

The absence of a male member in the household has tremendously increased Nirmala's work burdens as she has to perform all the activities on her own. On an average Nirmala spends 6 hours in agricultural activities daily and 4 hours on household activities. If we include her time spent in looking after animals, collecting fodder, fuel wood and some time for social interaction her total work time adds up to 15 hours. This implies that she has little time for leisure and recreational activities like watching television etc. or for other remunerative work. Although remittance from her husband has increased household income and provides for most of the household's requirements, agriculture forms an important part of Nirmala's life as most of the household's requirements for food is met through the farming activities. She considers farming to be a part of her household duties. In fact, for her it is not an occupation it has become her way of life. Further, being uneducated she cannot find employment opportunities outside the agricultural sector.

All major decisions related to the cultivation of crops i.e. the type of crops to be planted, the area allocated to different crops, agricultural implements to be purchased, hired

labour to be employed, sale of crops etc. are made by Nirmala herself. Though she informs her husband regarding her decisions it is not always possible for her to consult him while taking decisions. Even minor decisions of the household are taken by Nirmala herself. However, major decisions are taken in consultation with her husband. In the absence of a male household head Nirmala enjoys some level of empowerment in taking decisions related to agriculture and other household affairs. She manages the household budget and also takes care of the expenditure and savings.

On the other hand, absence of a male household head has also created several problems for Nirmala. She complains that people, especially hired labour do not follow orders properly at times which she believes can be attributed to her gender and lack of male member in the household. Burden of work due to absence of a male member leaves her with little time for attending any extension programme which would help her gain knowledge and information regarding agricultural productivity. Nirmala aspires for her children to complete their education and secure government jobs.

Case IV- Niru: De Jure Female Headed Household Head: Niru Chettri is a 47 year old widowed woman from Sitong Khasmahal in Kurseong sub-division. She was widowed seven years ago and at present lives with her daughter Sita, aged 25 and nephew, Nikhil aged 16. Niru's son Kaushal aged 22 works in a hotel in Delhi. Niru has studied up to class VIII while her daughter is a graduate and son has completed his secondary level education. Niru's husband was a cultivator and prior to his passing away Niru along with her husband would carry out farming activities. However, at present she is assisted by her daughter Sita in agriculture as well as other household activities.

Agricultural activity is carried out on an area of 1 acre out of a total of 1.2 acres. The land title is yet to be transferred to Niru with the land being registered in her late husband's name. The principal crops grown are carrots, radish, red round chillies, potatoes, other seasonal vegetables and broom grass. Niru markets almost all the crops grown keeping aside a small amount of vegetables for self consumption. Agricultural activity is carried out primarily by family labour which includes Niru and her daughter. For certain farm activities which involve physical work such as ploughing, carrying manure to the field, cutting and tying the broom grass into bundles etc. hired male labour may be employed for a few days. In the absence of hired labour Niru and her daughter carry out the tasks such as clearing the field and ploughing/hoeing. Labour exchange system of '*parma*' is also prevalent during the sowing and harvesting period.

The family also maintains two cows, eight goats and some poultry which are an important source of income for the family. In view of the time constraints Niru faces due to farming and household work, Niru sometimes employs labour for collection of fodder and cleaning the cow shed and collecting manure.

More than 50 percent of the annual household income is obtained from agriculture. Other sources of income include income through sale of milk, eggs and poultry, animals like goats; occasional remittance from her son and rural public works programme like the MGNREGS in which she or her daughter participates during the lean season.

Niru has been managing her household single-handedly since her husband's death. All major decisions related to farming as well as domestic activities are carried out by Niru herself. In this context it may be mentioned that Niru experiences some level of empowerment as she manages the household and undertakes all decisions. However, in the absence of a male member in the household and being the primary breadwinner she is burdened with multiple responsibilities. Niru's time commitment to daily farming activities is 6 hours on an average which in addition to looking after farm animals, collection of fuel wood, water and other domestic activities add up to around 15 hours of work in a day.

Niru also holds the post of Cashier of the Self-Help Group (SHG) in the village formed by a group of 10 women. The women meet twice or thrice monthly. This further gives her more responsibility and makes her more empowered not only within but even outside the household. It also earns her some amount of respect among the villagers.

The major problems mentioned by Niru include the problems related to supply of water for irrigating the fields. Though most of the crops are rain-fed, the carrots which are sown around the month of January need to be irrigated. However, the indifference on the part of the government authorities for solving the problem has increased her difficulties. This coupled with the menace of wild animals, attack by pests, lack of family labour and non-availability of hired labour make farming a tedious task. Niru is however contented and is hopeful that her son would get a higher paying job in Delhi and his remittances would increase. She also aspires for her daughter to secure a government job and not be involved in the back breaking task of farming.

Case V- Regina: Self-employed Non-Farm Worker: Regina Lepcha is 50 years old and resides in Git Dubling Khasmahal in Kalimpong district. She lives with her husband 54 year old Ladup Lepcha, two sons aged 23 and 21, a daughter aged 25 and a granddaughter aged 7 years. Regina has an upper primary level education whereas her husband is only functionally

literate. Her daughter Angelina eloped while still in school but eventually separated from her husband and is currently living with her parents along with her 7 year old daughter.

Regina runs a grocery shop along with her husband which is attached to her house selling food articles and other articles of everyday use. The annual income from the shop is approximately Rs.70,000 -80,000/-. Besides helping in the shop her husband is engaged in agricultural activities as the household owns 1.2 acres of land, registered in the husband's name, out of which only 1 acre is cultivated. Both her sons are employed as drivers of vehicles plying to and from Kalimpong town and Silguri which earns them an average monthly salary of Rs. 6,000-7,000/- each. Her daughter is unemployed and participates only in domestic activities. Regina spends most of her time looking after the shop and spends little time in domestic activities which is performed mostly by her daughter. Her sons leave early and get back at the end of the day and do not assist much in household activities.

The crops that are cultivated are big cardamom and broom grass and some seasonal vegetables in the backyard kitchen garden mostly meant for family consumption. Her husband Ladup carries out agricultural activities mostly with the help of hired labour or '*khetalas*', whereas backyard gardening is carried out mostly by her daughter Angelina and Regina herself. Her sons help out occasionally in harvesting big cardamom and cutting the broom grass when they take time off from their driving job.

The family also maintains some farm animals like cow, three goats and some poultry. All the members of the family are involved in the different activities related to rearing of animals though most of the work like fetching fodder, milking, stall feeding, cleaning the shed etc. is performed by Regina's husband and daughter. The farm animals provide some additional source of income especially goats which are sold off during festivals.

The total household income from the different sources amounts to Rs.2,75,000/-. The household budget is managed by Regina herself in consultation with her husband. Most of the decisions related to agriculture, the shop and household are also taken jointly by Regina and her husband although the children are also consulted in important matters. Regina is therefore seen to occupy a position of importance in the family as she contributes significantly to the family income and takes part in the decision making.

Angelina has education up to the higher secondary level and is presently unemployed. She however feels the necessity of taking up a job to look after herself and her daughter who is presently being supported by her parents and her brothers as her husband does not provide any maintenance. Angelina takes decisions regarding herself and her daughter in consultation with her mother.

Case VI- Yojana: A Housewife: Yojana Lepcha, 35 is a resident of Git Dubling Khasmahal in Kalimpong district. Her family consists of eight members- her parents-in-law aged 76 and 80 years old; husband Habil aged 35; two sons aged 12 and 9 among whom the elder one resides and studies in a school in Kurseong; and nephew and niece aged 12 and 11 years respectively. She has attained education up to primary level and is involved in household as well as agricultural activities.

The household is primarily agricultural deriving income from the agricultural sector. Yojana's husband Habil is a cultivator and is actively involved in agricultural activities. The family owns 9.28 acres of land out of which 2 acres is cultivated and the rest is not cultivated partly because it is precipitous, hence fallow and partly due to lack of labour. The land title is with Mr. N. T. Lepcha, Yojana's father-in-law. The crops that are grown are big cardamom, broom grass, red round chillies '*dalle khorsani*', potatoes and other seasonal vegetables. Agricultural activity is carried out by family labour as well as hired labour. Able bodied males also known as '*khetalas*' or agricultural labourers are also employed on wages or as a form of exchange labour for carrying out tasks such as ploughing, carrying manure and other loads, harvesting and cutting broom grass etc.

Since her husband is engaged in field work, Yojana has to perform all the domestic and household activities such as cooking, cleaning and washing, purchasing, looking after the children and her parents-in-law apart from tending to farm animals and helping out in agricultural activities. Her husband and children assist her in fetching fodder for the animals. Yojana also participates in the different agricultural activities especially during the sowing and harvesting period. She is also actively involved in weeding, uprooting of the red round chillies, picking vegetables and post harvest operations like storing etc. In fact, there is always some work or the other on the family farm. Cooking the daily meal for the '*khetalas*' and fodder for the farm animals besides cooking for the family takes up a significant amount of her time. She expends about 6-7 hours in household activities which adds up to about 15 hours if we include the time spent in looking after farm animals and performing activities in the family farm. It is only on Sundays there is some respite for Yojana when the whole family attends church and do not spend much time in the fields.

All major decisions related to agriculture are taken by her husband in consultation with her father-in-law who is the household head. Though her opinion is sought the final decision rests with the male members of the household. Regarding household affairs too Yojana normally takes decisions only in consultation with her husband. Rarely does she take any decision on her own. She does not have entire control over the household income too

since expenditures are made jointly. However, there is a certain portion of income over which she has sole control which is the income she earns by selling the red round chillies. The annual proceeds through sale of the red round chillies is around Rs. 50,000-60,000/- per year. She uses a part of this for making further investments and a part of it for buying household articles. She also uses it to make purchases of clothes and gifts during Christmas. This gives her some amount of control over the income which she earns even though she does not have the sole control over the household income.

Gender division of labour with women being confined mostly to household work and the presence of a male household head is partly responsible for her subordinate position in the family and her inability to take decisions on her own. Although she toils from dawn to dusk performing all the activities which contribute to the household's food and economic security her contributions tend to be underestimated.

Case VII- Santu: A Family Labour: Santu Pakhrin is a 42 year old unmarried woman from Sitong Khasmahal in Kurseong sub-division. She lives with her aged parents and her cousin Reena aged 20. Santu attained an education up to Class VIII in a nearby village school. Being the only child of her parents Santu has not been able to marry as there would be no body to look after her aged parents. Santu's mother, 79 was paralysed about 5 years ago and is completely bed-ridden. Her father is 80 and helps her with light household tasks. Santu's cousin Reena also provides some assistance in household tasks.

The family owns about an acre of land which is registered in her father, Mr. S.B. Pakhrin's name. However, due to lack of time and labour only 0.2 acres is cultivated, the rest being fallow. Santu cultivates seasonal vegetables like radish, carrots, potatoes, green leafy vegetables like '*rai saag*' etc. on the plot of land with the help of her cousin, and some hired labour which she employs occasionally for ploughing the field. Being the only working aged member in the family Santu participates in almost all the activities related to farming such as ploughing, sowing, weeding, harvesting, marketing etc. With the exception of radish all other vegetables are meant for self consumption. The radish which is marketed to Siliguri earns her a meager sum of about Rupees 10,000-12,000/- per year depending upon the prevailing market value.

The family also owns one cow which is reared for supplying manure and milk. The cow supplies about 5 kgs of milk per day which is sold to one of the milk collectors in the village who markets it in Kurseong town after collecting from all the sellers in the village. Santu also maintains some poultry for eggs and meat. She looks after the cow and does most of the work like milking, fetching fodder, cleaning the shed and collecting the manure etc.

She is assisted occasionally by Reena in fetching fodder and her father in milking and cleaning the shed. Santu performs almost all the household activities of cooking, cleaning and washing, purchasing food and household articles, looking after her mother etc. with her cousin assisting her in minor household chores. On an average she spends about 14 hours a day in performing her daily tasks which leaves her with little time for leisure or personal care. This also restricts her from taking up any other remunerative activity to supplement the family income.

The main source of income of the household is obtained from the old age pensions to which her parents are entitled. The family also earns some income through sale of milk, eggs and poultry and agricultural products. The annual income of the family from all sources is around Rs 75,000/- . A major portion of the income is spent on food and medicine for her mother with very little left as savings.

Santu mentions that lack of labour is one of the critical reasons for her not being able to carry out agricultural activities on a commercial scale. Further, the menaces of wild animals which destroy the crops also discourage people in the area from expanding their agricultural activity. Little or no help has been available from government agencies for controlling the menaces of wild animals as well as provision of facilities for improvement of agricultural practices in the region. Assistance from the government in terms of training, distribution of seeds, fertilizers, credit etc. at subsidized rates or other avenues of employment in non-farm activities would prove beneficial to women like Santu in income generation as there is limited scope for increasing agricultural productivity.

The different case studies presented provide an insight into the diverse nature of activities that rural women are engaged in. Women's reproductive labour which includes cooking, cleaning, washing, caring for children and the elderly are indispensable for family sustenance and take up a considerable portion of women's time. Women also devote a significant portion of their time to productive labour which takes the form of agricultural activities, animal husbandry as well as participation in non-farm activities. Such activities are key contributors to family income. In female headed households and in households where women are key contributors to household income through their participation in the labour market, are relatively more empowered vis-a-vis their counterparts engaged mostly in unpaid household work. Agricultural activities suffer from low productivity due to inadequate water supply, menace of wild animals, pests, crop disease as well as the effects of climate change. Lack of adequate government assistance for improving agriculture and low employment generation in the non-farm sectors are the persistent problems of the rural areas.

7.7. CONCLUSION

Considering the significant role played by women in the study area in agricultural and allied activities primarily as unpaid family labour on family farms, the present chapter has attempted to determine the factors that affect the amount of time spent by women in agriculture. The study observes that women's participation in agriculture is determined by the socio-economic and demographic characteristics. The factors that are significant in explaining women's involvement in agriculture are- age of the respondent, education as measured by the years of schooling, marital status of the respondent, primary occupation of the household head, the size of land holding of the household and the time spent by the male members in agriculture. The life cycle effect of age on women's involvement in agriculture is clearly evident from the results of the study with younger and older aged women's participation being less than that of middle aged women. Women with higher levels of education were found to spend less time in agriculture which highlights the fact that higher levels of education increases the aspirations for better paid jobs outside agriculture. The results of the study also indicate that currently married women tend to spend more time in agriculture as opposed to the others category. This implies that farming may still be considered a part of household activity which compels married women to invest more time in it. Women from agricultural households and households having larger landholdings are also found to be showing higher time commitments to agriculture in the study area. The time spent by the women in agriculture has also been found to be inversely associated with the time spent by the male members of the households which implies that the female labour is a substitute to male labour. The structure of the family, presence of a male migrant, presence of children below the age of six years and the monthly per capita consumption expenditure of the household which is regarded as a proxy for household income are found to have non-significant effects on the time spent by women in the study area. From the results of the study therefore, hypothesis (7) which postulates that women with larger land holdings spend more time in agriculture is accepted.

Women in rural households also contribute significantly to household food and economic security through their involvement in crop production and related activities. Their role is indispensable in each of the components associated with food security right from production on the family farms, to preparation of food and its distribution within the household. Women's key role in crop production along with tending of farm animals, maintaining poultry, fish farming etc. all contribute to the food security of the households.

Besides these, women's unpaid domestic work including collection of critical resources for survival, soil and water conservation, afforestation, crop domestication etc. are crucial elements of household food security. The significant role of women in the study area in ensuring food security can be gauged from their participation in different activities related to crop production, animal husbandry and domestic activities which includes cooking, collection of fuel, water etc. The average participation of women in the three villages in activities related to crop production and animal husbandry is 53 and 56 percent respectively, whereas in household activities it is 78 percent.

Women's lack of access to productive resources such as land, credit, extension services etc. as documented by several micro and macro studies has been found to be a major constraint in women's active involvement in agriculture. The gender gaps in access to and control over productive assets is also detrimental to growth and development and is linked to women's lower status within the household and society besides leading to lower agricultural productivity. In this regard ownership of land is critical since it is also linked to the access of other productive assets like credit, fertilizers, extension services etc. However, in most regions and communities across the world the patrilineal system of land inheritance implies that very few women have access to land titles. In the present study, due to limitations regarding empirical data women's access to productive assets have been considered with regard to the following assets-land, credit, savings, training and membership of social groups like self-help groups etc. The results of the study indicate that only about 5 percent of women in the study area have ownership of land either individually or jointly, 26 percent of women had loans granted in their names mainly through micro credit institutions like self-help groups (SHGs) and 30 percent had attended training programmes organised by government agencies. On the other hand, 54 percent of women in the study area were members of the self-help groups (SHGs) and 70 percent of women in the study area had an account in the bank or the post office. The major reason cited by women for not obtaining credit in their names through banks was the lack of land ownership, whereas the primary reason for women not being able to attend the training programmes was the time constraint on account of household and farm work. Given these constraints, it is essential that development policies focus on specific needs and problems of women farmers and devise policies to overcome the barriers that inhibit women's active involvement in agriculture.

Finally, the chapter also presents some case studies of women in the three villages to have an in depth understanding of the nature and extent of their work. The case studies point to the active involvement of women in multiple activities for ensuring the welfare of the

households. Higher work burden is also experienced by female headed households, both de facto and de jure.

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Chapter VIII

Summary and Conclusion

8.1. INTRODUCTION

The issue of female labour force participation or participation of women in economic activities gained prominence during the decade of the 1970s wherein the benefits of macroeconomic strategies aimed at modernization and growth failed to “trickle-down” to the poor, especially women and improve their conditions as was advocated by the prevalent development theories. Scholars and academicians challenged the “trickle-down” theory and advocated for inclusion of women in the development agenda for addressing their needs through recognition of their roles and contributions in the development process. The declaration of the United Nations Decade for Women launched in 1975 with 1975 as the International Women’s year may be regarded as a landmark in the history of women’s movement as women’s issues now gained international visibility. This gave rise to a vast amount of research on women’s issues highlighting their disadvantaged position and exploring means to address it.

Scholars’ interest on female labour force participation arises principally due to the fact that much of women’s labour escapes statistical visibility despite being crucial for the sustenance of the family, hence society, and have stressed on the need for a proper evaluation of the same through appropriate methods. The invisibility of women’s labour, as mentioned by many, arises due to the gendered nature of work which has its roots in the sexual division of labour, with the sexual division of labour being determined traditionally by the biological differences between men and women. Being naturally involved in procreation, women may be regarded as nurturers or care givers with their activities being confined to the domestic spaces i.e. within the household. Men, on the other hand have been associated traditionally with hunting or providing for the family which has led to the emergence of their role as bread winners, with their domain of operation being outside the household. Being confined to the household and not being exchanged for a price, a good amount of women’s work therefore remains unrecognized and hence unvalued. Significant bias in the definition of national income and in the collection of statistics in several countries with regard to women’s work, especially in rural areas, is another reason for under valuation of women’s work. In many instances the biases arise on the part of the enumerator, and in several others on the part of the respondents themselves who do not consider themselves as economically active despite

having active involvement in agriculture and other allied activities. The monetization of women's non-market work and valuation of their labour is not just a question of justice, but concerns the status of women in the household and society.

Another factor that has aroused the interest of scholars regarding women's work is its diverse and complex nature. While men's involvement in economic activities is determined fundamentally by economic motive of providing for the family, the reason why some women work and some don't is rooted in a wide range of economic and non-economic factors such as demographic, cultural, social, religious, personal etc. In patriarchal structures, women's work may be determined by the patriarchal norms regarding appropriate work for women, and the distinctions based on class/caste wherein women belonging to higher socio-economic class usually do not participate in activities outside the household. Owing to its diversity and complexity, it is therefore inappropriate to make generalizations regarding women's work and its determinants. Women's work hence needs to be examined with reference to the specific context under consideration.

The rationale for undertaking the present study therefore can be clearly understood from the facts that much of women's labour is subject to invisibility, and that women's work participation decisions are diverse and complex requiring region specific analysis. The primary objective of the present study undertaken in the Darjeeling hills of West Bengal is to investigate the nature and extent of women's work participation in the mountain farming systems and to highlight the significant role that women play in the rural hill economy through their involvement in different activities related to agriculture and allied activities along with unpaid domestic work. Women in the hill regions although having higher work participation in comparison to the other areas, show a predominance of family labour compared to wage labour. High work participation in the hill regions however does not indicate a high status for women rather it is a reflection of their hard economic life (Pande, 1996, p. 154). Further, hill and mountain regions owing to difficult terrain, lack of proper transport, cold climate and other constraints face marginalization in several respects. Women, in such settings therefore face double marginalization being the marginalized gender in marginalized areas. The present study therefore stresses on the need for recognition and valuation of women's contribution and suggests measures which may help to reduce women's work load and improve their status in society. The summary of the major findings of the study undertaken in the hill regions of Darjeeling district of West Bengal is presented in this chapter.

8.2. SUMMARY OF MAJOR FINDINGS

The significance of hill and mountain regions in the global map can be understood from the fact that they occupy 24 percent of the global landscape and are home to 12 percent of the world's population. Mountain regions provide critical resources for survival and are important biodiversity hotspots. Nevertheless, they are some of the least developed regions of the world and face several constraints being inaccessible, marginal and fragile. The high rate of out migration of working aged males from hill regions leaving behind only the women, children and the elderly has led to additional work burden for women folk in these areas as they now need to perform tasks previously performed by men. Women being the principal production agents in the hill regions, women's work participation are significantly higher than in the plains. However, not being a part of the mainstream gender concerns in mountain regions has received little attention from scholars. Recognizing the importance of women in the rural hill economy, the present study has therefore been undertaken in the Darjeeling Hill region of the state of West Bengal to bring to light the nature and extent of work undertaken by women.

Located within the Lesser and Sub - Himalayan belts of the Eastern Himalayas the hill areas of the Darjeeling district occupy an area of 2,477.83 square kms which constitutes 79 percent of the total area of the district and is home to half (47 percent) of the district's population. Despite its declining share in the district's domestic product, agriculture is an important contributor to the economy of the district, the other important contributors being tea, timber and tourism. The agriculture practiced in the Darjeeling Hills is different in nature from the mainstream agriculture practiced in low land areas since the techniques are primarily traditional, labour intensive and is characterised by small scale of operations. The constraints imposed by the altitude leave only 13% of the total land being available for cultivation in the hills. Agriculture in the region is greatly influenced by altitude and slope aspect and the methods of cultivation in the hills vary with the crops to be grown. No crops are grown above 2,895 meters due to the cold. The productivity levels of the district are low compared to the other districts for almost all crops which could be attributed to the prevalence of small and marginal holdings; infertile land; poor irrigation facilities and inability to use modern technology. Nevertheless, the district shows higher productivity for different fruits and vegetables as compared to the productivity of other principal crops. Further, the state including the hill areas of Darjeeling district also has immense potential in

the cultivation of medicinal plants and herbs which could be harnessed for increasing the income of the rural agricultural households.

In recent years there has been a decline in the proportion of the hill population in the district which may be an indication of migration of the hill population to the lowland areas or an in migration from the surrounding states or countries to the Siliguri sub-division of the district. The proportion of the district's female population residing in the hills is also found to be greater than the proportion of the male population in both rural and urban areas which may again be an indication of male outmigration from the hill areas. The high population density and the increasing rate of urbanization of the hill areas may have adverse effect on the quality of life of women and their status in society as problems related to lack of civic amenities like sanitation, water supply, growth of slums, and increase in criminal activities etc. The sex ratio of Darjeeling district is higher than that for West Bengal and India which could point to out migration of males from the district to cities and towns in search of better employment opportunities which leads to an increased work burden of women. In terms of literacy rates the hills fare better than the district for both males and females. An upward trend in the female literacy rates is also observed which is a positive indication. Although the increasing and high levels of female literacy rates indicate improvement in the status of women, its importance should not be over emphasised. It should be analysed with respect to other indicators of women's well being.

The work participation rates for male and females in 2011 were 51.17 percent and 22.44 percent respectively in the district with the female work participation rate in the district being higher than that in the state. The district ranked 6th out of its nineteen districts according to the Census 2011 figures with a female WPR of 22.4 percent. As regards rural female work participation rates, the district ranks third among the nineteen districts. Analysis of WPRs for the district reveals higher rates for rural females in comparison to those in urban areas indicating higher work burden for the rural women. An increasing trend towards casualisation of the workforce, both male and female has also been observed as marginal category workers have registered significant growth rates during the period under analysis along with increasing WPRs. Within the agricultural sector although an increase in growth of agricultural labourers accompanied by a decline in cultivators has been observed, the general trend is a shift towards non-agricultural work as revealed by the declining proportion of rural workers in agriculture. The life cycle effects of age on female WPRs is also observed from the age specific WPRs wherein women of child-bearing and child rearing age show lower WPRs being burdened by these responsibilities. The age specific WPRs were found to reach

a peak during the middle age group of 30-49 years. The relationship between female WPRs and the level of education points to a more or less J- shaped relationship with illiterates having a higher WPR in comparison to literates up to secondary level of education. The WPR then increases for those with technical education, declines for graduates and then rises for those with technical degree. Similar pattern is observed in rural and urban areas with rural rates being higher than urban rates.

8.2.1. Employment Structure and Labour Force Characteristics of the Sample

The present study has been carried out in three rural villages in the hill regions of the Darjeeling district each belonging to the three hill sub-divisions of the district i.e. Darjeeling Sadar, Kalimpong and Kurseong. The study has been undertaken prior to the bifurcation of the Darjeeling district into Darjeeling and Kalimpong on 14th February 2017. Darjeeling Sadar and Kalimpong (now district) sub-divisions have three Community Development blocks each and Kurseong sub-division two Community Development blocks. One community development block each, with a higher than average proportion of agricultural workers, was chosen from Darjeeling Sadar and Kalimpong, and Kurseong block was chosen from Kurseong sub-division because of its proximity to the town. Darjeeling-Pulbazar block was chosen in the Darjeeling Sadar sub-division with 44.2 percent of agricultural workers, and Kalimpong II was chosen in Kalimpong sub-division with 61.9 percent of agricultural workers. In Kurseong sub-division Kurseong block was chosen over Mirik due to proximity from the town. From each community development block, one village each was chosen randomly with a relatively high proportion of agricultural workers. The villages selected for the purpose of the study were Samalbong in Darjeeling-Sadar, Git Dubling Khasmahal in Kalimpong II, and Sitong Khasmahal in Kurseong. In each village 50 households were purposively selected for the study where the family members participated in agricultural activities either for commercial purposes or for subsistence. This gave a total of 150 households surveyed.

The villages chosen for the present study are primarily agrarian in character. In Samalbong village in Darjeeling Sadar sub-division, the percentage of households deriving income from agriculture as a primary activity is 38 percent which is an indication of agriculture being primarily for subsistence. An important factor explaining this could be the smaller size of the land holdings in Samalbong village which is only 1.4 acres. The larger proportion of unitary families could help to explain the smaller size of the land holdings in Samalbong village since land holdings get fragmented as families divide. The average monthly income in the Samalbong village is Rs. 11,347.97 with 92 percent of households having

monthly income up to Rs.20, 000. The male and female literacy rates are 88.3 and 88 percent respectively. The work participation rate (WPR) of the sample according to the *usual principal activity status (ps)*, in Samalbong village is 59 percent for males and 41.6 percent for females both of which show an increase according to the *usual subsidiary activity status (ss)* and the *usual status (ps+ss)*. The structure of employment according to the *usual status (ps)* reveals 43.5 percent of the male workers to be employed in agriculture in comparison to 72.3 percent for the female workers with higher proportion of self employed in agriculture. Allied activities which include livestock rearing, sericulture and fish farming were not taken up as a primary activity in the region but were important sources of subsidiary household income. The jobs outside agriculture for the males included carpentry, driving vehicles, government jobs like the army or casual jobs in construction/MGNREGA as casual labour or overseer. For the women, the off farm jobs included opening a shop in the precincts of the house selling household articles, teaching or casual labour in MGNREGA during the lean season in agriculture. Some women were involved in preparing and selling country liquor.

In Git Dubling Khasmahal in Kalimpong II, 70 percent of the households are dependent on agriculture as a primary activity. The average land holding is 2.8 acres. The average monthly income is Rs 22,814.83 with 78 percent having monthly income in the range Rs. 10,000-30,000. The male and female literacy rates are 94.1 and 86.7 percent respectively. The male and female WPRs according to the *usual principal activity status (ps)* are recorded as 59.8 and 52.8 percent respectively. The structure of employment shows that the percentages of male and female workers employed in agriculture according to the *usual status (ps)* are 65.8 percent and 82.5 percent respectively with the percentages increasing for both males and females according to the *usual status (ss)* and *usual status (ps+ss)*. In agriculture, most of the workers are in the self employed category and very few are agricultural workers. Allied activities which include livestock rearing or keeping poultry is taken up as a subsidiary activity with women's involvement being greater than that of men. The off farm activities taken up by the males include teaching, driving vehicles, running a shop, government jobs or casual labour in construction/MGNREGA. For females off farm jobs included running a shop, teaching and working in government office along with casual labour in public works like MGNREGA.

In Sitong Khasmahal village in Kurseong sub-division the proportion of households dependent on agriculture as a primary activity is 44 percent. The average land holding is 1.7 acres with 72 percent of households owning land upto 2 acres. The average monthly income is Rs.15,860.72 which is higher than in Samalbong village but lower than in Git Dubling

Khasmahal. Only 8 percent of households have income above Rs. 30,000. The male and female literacy rates in the village are 95.0 and 85.2 percent respectively. According to the *usual principal activity status (ps)* the male and female WPRs are recorded as 56.3 and 47.8 percent respectively. While 40.3 percent of male workers are employed in agriculture, 87.7 percent of female women workers are engaged in agriculture according to *usual status (ps)*. Among those engaged in agriculture majority are self employed i.e. cultivators and very few are agricultural labourers. Among non-agricultural activities, the majority of the workers both male and female are employed as regular wage/ salaried workers. The male non-farm workers were employed in the army, government offices, or were working in other places like Kurseong town, Delhi, Bangalore, Dubai etc. Some were engaged in carpentry, driving vehicles, teaching or petty trade such as opening a shop etc. Women's off farm jobs included teaching, maintaining a shop, tailoring, ICDS helper, government jobs etc.

Among the three villages it can be seen that in Git Dubling Khasmahal village in Kalimpong there is a larger proportion of households dependent on agriculture as compared to the other two villages. The average size of land holding and the average monthly income of the household in the village is also more than in the other two villages. An important feature regarding the employment structure in all three villages is the high proportion of self employed in agriculture with minimal usage of agricultural labour. The labour exchange system of '*parma*' along with '*khetalas*' cuts down the use of hired agricultural labour considerably. There is thus a predominance of family labour in the region which is an important characteristic of hill agriculture. The higher usage of family labour in the hill areas as compared to the plains could also be attributed to the prevalence of marginal holdings in the hill areas which are generally cultivated by family labour. In the plains, the land holdings are relatively larger which entails the usage of hired labour-male, female or both.

In Samalbong the principal crops grown are vegetables which include potatoes, squash, beans, peas, cabbage, ginger etc. along with black cardamom. In some of the households at a little lower altitude paddy, maize, pulses etc. were also cultivated. In Git Dubling, the principal crops were black cardamom, broom grass, red round chillies or '*dalle khorsani*' along with potatoes and other seasonal vegetables. In Sitong Khasmahal, the principal crops were carrots, radish, broom grass, red round chillies or '*dalle khorsani*', seasonal vegetables like squash, beans, '*rai saag*' etc. Black cardamom is also cultivated in certain households.

8.2.2. Women's Work and Gender Division of Labour

In an attempt to understand the dynamics of gender division of labour in the rural hill region the study has examined the work patterns of men and women in different activities related to crop production, livestock rearing and household activities. Analysis of gender division of labour in different activities related to crop production and livestock rearing reveal the active involvement of women in almost all activities. There are few tasks which are gender specific and women partake in almost all activities related to crop production as family labour. As regards household work, there is very little sharing of such activities by men with the bulk of the work being performed primarily by women which points to the gendered nature of household work.

The study of gender differentials in time allocation also corroborates the above findings. Women's total contributions in terms of time allocated to different activities are larger than that of men in all three villages with women expending the bulk of their time in domestic activities vis-a-vis men who expend more time on personal activities. ANOVA tests reveal significant differences in average total time spent by men and women per day in all the three sampled villages. Therefore, the hypothesis which states that women's work burdens in the hill regions are higher than that of men can be accepted in the present study.

In terms of time spent per day, women in Samalbong and Sitong Khasmahal villages expend more time in crop production and livestock rearing whereas in Git Dubling Khasmahal village the opposite is true. The empirical study also reveals higher work participation rates for women in agriculture as compared to men in the three villages. Analysis of variance (ANOVA) tests however reveal statistically non significant results for the time spent by men and women in crop production and livestock rearing in all the three villages. The study therefore partially accepts the hypothesis that the labour input of women is higher than that of men in agricultural activities.

Among the several productive and non-productive activities that women perform, household work which includes cooking, cleaning, washing, caring for children and elderly etc. is fundamental for sustenance of the family. Women's involvement is also found to be relatively higher than that of men in activities such as collection of critical resources for family sustenance such as fuelwood, water and fodder for animals. This requires a lot of physical labour since it involves travelling for long distances especially in recent times due to depletion of forest, drying up of springs etc. These activities may also prove hazardous as women sometimes need to work on steep slopes to procure these resources.

The findings of the present study reinforce the fact widely prevalent in literature on women's work that women bear a disproportionate load of domestic work. The total time devoted by women to such activities is clearly much greater than that of men in all three villages with ANOVA test showing statistically significant results. The study therefore accepts the hypothesis that the labour input of women is higher than that of men in domestic work.

Since land in rural areas is a primary asset as it determines social status along with economic and political power, women's participation in rural areas may be determined by the amount of land owned by a household. The gender differentials in time allocation to different activities on the basis of the farm size have been analysed. The holdings have been grouped into three categories-less than 1 acre, 1-2 acres and more than 2 acres. In the present study with increase in size of the holdings an increase in time spent by women in crop production has been observed in the sampled villages. Statistically significant differences in crop production on the basis of size of land holding were observed only in Git Dubling Khasmahal village. In Git Dubling Khasmahal village, besides crop production statistically significant difference was observed in livestock rearing and total time per day. In Samalbong village statistically significant differences were not observed in any activity while in Sitong Khasmahal village statistically significant difference was observed in forage collection and fuel collection. The empirical evidence presented in the study does not provide conclusive results regarding increased participation of women in agriculture with increase in size of holdings and increased participation in non-agriculture for smaller sized holdings as the results do not hold uniformly for all the three villages under study.

8.2.3. Covariates of Rural Female Work Participation

To understand the effects of socio demographic and economic variables on women's work participation in the region, a logistic regression exercise has been undertaken in the present study in which two separate models have been estimated. The first model takes into consideration both paid and unpaid employment of women as participation in the workforce and includes women in paid/wage work or self-employment, as well as those engaged in family farms as unpaid family labour. In order to arrive at the determinants of women's paid work, the second model considers a more restrictive definition of participation that includes only paid market work, but covers both wage work and self-employment. The results of the analysis show that women's employment in the rural hill regions is characterised by a predominance of unpaid work as family labour in agriculture. While 71.9 per cent of working-age women in the study were employed in paid as well as unpaid employment, only

14.5 per cent reported active participation in paid employment. This highlights the crucial role that women in the rural hill economy play through their involvement in unpaid farm employment and allied work which contributes significantly to household food and economic security.

The different variables considered for the analysis include several socio-economic and demographic variables such as age and age squared, education, structure of the family, presence of children below the age of six years, marital status of the women, primary occupation of the household head, presence of male migrant in the household, monthly per capita consumption expenditure of the household and the ownership holding of the household. The findings of the study show that the age of women has a non-linear effect on their participation in economic activities (paid as well as unpaid work) which highlights the life cycle effects of age. This implies that younger women being engaged in child-bearing and rearing activities, and other household work; and older women due to their age may not participate in economic activities as much as middle-aged women. However, age does not show a significant effect on women's work decisions, if we consider only paid work.

Although theoretically a positive correlation may be expected between levels of education and female labour force participation, results from developing countries present mixed results (Standing 1981 cited in Ackah *et al.* 2009) with some studies showing a negative relation between the two while others indicate a non-linear relation. The results of the study indicate the significant positive effect of education on women's involvement in paid work. When we consider women's paid and unpaid employment however, education did not have a significant effect on women's work participation. Women with higher levels of education preferred to take up non-farm jobs either in self-employment or wage employment. From the results of the study the hypothesis which states that education enhances women's participation in the labour market is accepted with some modification as education has been found to be positively associated with women's participation in paid work only.

The structure of the family was also observed to have an important effect on women's labour market behaviour, with women in nuclear families showing higher participation as compared to women in joint families. The presence of a single male breadwinner and the desire to augment family income in order to improve living standards may be contributing factors for higher work participation of women in nuclear families. This suggests a higher work burden for women in nuclear families where there is very little sharing of domestic responsibilities. The study also shows that the presence of children under the age of six reduced women's participation in paid work. The marital status of women was non

significant in determining women's involvement in economic activities in both models, although an inverse relation between the two was observed in both the models.

The presence of a male migrant in the family and the per capita consumption expenditure of the household, a proxy for household income, had no significant effect on the work participation of women in the study. These findings contradict the findings reported in several studies that male out-migration and low family income increases female work participation. In the present study the hypothesis which states that male out-migration has increased the work participation of hill women can thus be rejected. The study also rejects the hypothesis that labour force/work participation of women is relatively higher in case of low income families since it is not supported by the results of the study. Finally, size of landholding was found to influence women's participation in paid activities in the study area, with women in households with smaller landholdings showing a higher likelihood of participating in paid activities.

8.2.4. Women's Participation in Agriculture

The structure of employment in the study area shows that among the women who are involved in any form of economic activity, a higher proportion is engaged in agriculture with most of them being self-employed. The remaining who are considered to be engaged only in domestic activities are also involved in agriculture in subsidiary capacity. As such they form important components of the labour force. A predominance of family labour, especially female labour is hence observed to be an important characteristic of farming in the study area. Realizing the importance of women's labour inputs in agriculture, the study attempts to identify the factors that determine the time invested by women in agriculture through a multiple regression analysis. The results of the regression analysis indicate that the socio-economic and demographic factors that are significant in explaining women's involvement in agriculture are- age of the respondent, education as measured by the years of schooling, marital status of the respondent, primary occupation of the household head, the size of land holding of the household and the time spent by the male members in agriculture.

Age has a non-linear effect with time spent in agriculture increasing up to a certain age and decreasing thereafter. The younger and older aged women's participation is less than that of middle aged women showing the life cycle effect of age on women's involvement in agriculture. Education significantly influences women's involvement in agriculture wherein women with higher levels of education were found to spend less time in agriculture. This highlights the fact that higher levels of education increases the aspirations for better paid jobs outside agriculture. The results of the study also indicate that women who are currently

married tend to show a higher involvement in agriculture as opposed to the other category which includes unmarried/ widowed/ separated/divorced women. This implies that since farming in rural areas is a way of life and considered to be a part of household activity married women invest more time in it. Women belonging to agricultural households and households with larger landholdings are also found to be spending more time in agriculture in the study area. The time spent by the women in agriculture has also been found to be inversely associated with the time spent by the male members of the households which implies that the female labour is a substitute for male labour especially in agricultural households. The structure of the family, presence of a male migrant, presence of children below the age of six years and the monthly per capita consumption expenditure of the household which is regarded as a proxy for household income are found to have non-significant effects on the time spent by women in the study area. From the results of the study therefore, the hypothesis which postulates that women with larger land holdings spend more time in agriculture is accepted in the present study.

Women in rural households perform multiple tasks which help in ensuring food and economic security of the households. Food security is built on three pillars which include availability of food, access to food and use of food, with women's role being indispensable in each of the components associated with food security starting from production to preparing food and distributing it among the members of the household. Women's key role in ensuring food security in the study area can be understood from their participation in different activities related to crop production, animal husbandry and domestic activities which includes cooking, collection of critical resources such as fuel, water etc. While a little over fifty percent of women have been found to be participating in agricultural activities in Git Dubling Khasmahal (55 percent) and Sitong Khasmahal (54 percent), the average participation of women in Samalbong village was about 48 percent with the average participation of women in the three villages in activities related to crop production being 53 percent. Women were also actively involved in animal husbandry with the average participation being 52, 61 and 56 percent respectively in Samalbong, Git Dubling Khasmahal and Sitong Khasmahal villages respectively. In all the three villages taken together the average participation in animal husbandry was 56 percent. In household activities the average participation was found to be higher in all the villages with the percentages being 84, 80 and 72 respectively in Samalbong, Git Dubling Khasmahal and Sitong Khasmahal villages with the average for all three being 78 percent.

Despite women's essential role in different aspects related to food security, they are at a severe disadvantage mainly due to inequality in access to productive resources. As documented by several micro and macro studies women's limited access to productive resources such as land, credit, extension services etc. has been found to be a major constraint in their active involvement in agriculture which besides lowering agricultural productivity is also linked to women's lower status within the household and society. The FAO (2011) reports that empirical evidence from many different countries show that female farmers although being equally efficient as their male counterparts, produce less since they possess less land and use fewer inputs (FAO, 2011, p. 4). The FAO further mentions that if access to productive resources were equal for women and men, women could increase their farm yields by 20–30 percent raising total agricultural output in developing countries by 2.5–4 percent and reducing global hunger by 12–17 percent (*ibid*, p. 5). Among the different resources land is critical since ownership of land is linked to the access of other productive assets, like credit, fertilizers, extension services etc. However, the patrilineal system of land inheritance prevalent in most regions and communities across the world implies that very few women have access to land titles. Kelkar (2011) mentions that despite the fact that there is feminisation of agricultural work, women do not own land which is one of the reasons for the persistent gender inequality, and also why agricultural extension and information on new technologies are mostly targeted towards men. In the present study, due to limitations regarding empirical data women's access to productive assets have been considered with regard to the following assets-land, credit, savings, training and membership of social groups like self-help groups etc. The results of the study indicate that only about 5 percent of women in the study area have ownership of land either individually or jointly, 26 percent of women had loans granted in their names mainly through micro credit institutions like self-help groups (SHGs) and 30 percent had attended training programmes organised by government agencies. On the other hand, 54 percent of women in the study area were members of the self-help groups (SHGs) and 70 percent of women in the study area had an account in the bank or the post office. The major reason which women mentioned for not obtaining credit in their names through banks was the lack of land ownership, whereas the primary reason for not being able to attend the training programmes was the time constraint on account of household and farm work. Given these constraints, it is essential that development policies focus on specific needs and problems of women farmers and devise policies to overcome the barriers that inhibit women's active involvement in agriculture. Kelkar (2011) advocates for

“a new deal for women in agriculture, along with necessary inputs, technology and credit support” for efficient use of resources leading to increased production.

8.3. POLICY RECOMMENDATIONS

From the analysis carried out in the present study it may be concluded that women are a core element of the rural hill economy. Realising the crucial role of women in agriculture, inclusion of women in the development agenda is therefore imperative for achieving high growth rate in the region. Policies formulated for improving agricultural productivity should include guidelines especially targeted towards women. In this regard the following suggestions may be put forward:

1. Hill and mountain regions have certain distinctive features known as mountain specificities which are noticeably different from the lowland areas. The specificities of inaccessibility, fragility and marginality create several constraints in the mountain areas which makes them marginalized in several respects. Development policies formulated for the lowland areas may therefore be ineffective in addressing the specific requirements of the hill regions as the mountain perspectives may be missing in most of these policies. Development agencies therefore need to be sensitive towards the needs of the mountain communities by acknowledging their differences from the mainstream and including the mountain perspective in development strategies.
2. As observed from the study, agricultural practices in the villages suffered from low productivity and low level of profits. To make agriculture more productive and remunerative it is necessary to diversify traditional agriculture from food crops to high value cash crops, horticulture, floriculture, sericulture, mushroom cultivation, cultivation of medicinal plants etc. This can be done through identification of niche products in the region i.e. the products in which the region has comparative advantage. This will lead to increased incomes of farm households.
3. Transformation of traditional agriculture requires infrastructural development in terms of improved and efficient transport system linking remote villages with urban centres, provision of warehousing and storage facilities for agricultural products, improved marketing facilities through co-operatives and higher procurement prices.
4. Inclusion of gender perspectives in agricultural development policies focusing on specific problems and constraints faced by women in the region would help improve

women's position. In this regard provisions should be made for increasing women's access to productive resources e.g. through micro credit, special saving schemes for women, programmes imparting training and extension services to women in non-traditional varieties of crops and allied activities like bee keeping, fish farming etc.

5. Animal husbandry or rearing of livestock is a characteristic feature of mountain farming systems since animals provide the much needed draught power and is a primary source of organic manure, besides supplementing household income through sale of dairy products, meat, eggs etc. Women's role in the different activities related to rearing of livestock is also found to be quite significant in the region. In this regard therefore, development of animal husbandry on a large scale may help in providing employment to a large number of women in the region. Although some households were engaged in selling of milk and other dairy products, it was carried out on a small scale. Taking inspiration from co-operative dairy farming in other regions of the country, the same could be carried out in the area by involving women in its various operations which would provide an important source of livelihood for many in the area.
6. Steps may also be undertaken for development of household industry in the region through setting up of cottage and small scale industries for augmenting the income of the rural households. This would be particularly important in the context of providing employment opportunities to women in the region since most of them are employed as family labour as is evident from the results of the study. Development of handicrafts industries such as bamboo carving, carpet weaving, knitting of woolen garments, pickling, production of jams, jellies and juices etc. can be initiated through co-operatives, self-help groups etc. Training and skill development programmes can be organized for women to harness their entrepreneurial abilities.
7. One of the factors that led to an increased burden of work for women folk in the villages was collection of critical resources for sustenance i.e. fuel wood, water, fodder for animals etc. which often required women to travel long distances. In this regard the drudgery of women can be reduced through easier availability of LPG, provision of community tanks, water supply connection etc. Rain water harvesting may also be considered as an option for improved availability of water for household and agricultural purposes.
8. The results of regression analysis undertaken in the study indicate that women with higher levels of education spend less time in agriculture and are found to be employed

more in paid work outside agriculture. The results of the study however show that employment of women in the non-agricultural sector is very low. The lack of remunerative non-farm jobs in the region may have caused many women to remain outside the work force despite having higher levels of education. This calls for revamping of the existing educational system and provision of vocational and technical education through setting up of Industrial Training Institutes, Polytechnics and other institutes for imparting professional courses to the youth in the region.

9. Finally, a proper recognition of women's work and their contributions is necessary to improve women's status within and outside the household. Although patriarchal norms and cultural biases regarding women's position is not very severe in the hill areas and women enjoy greater autonomy and respect as compared to the other regions of the country, gender sensitization is nevertheless important regarding women's status so that women are regarded as equal partners in the development process.

It can therefore be concluded that a holistic approach towards women's issues in mountain regions is necessary for recognizing women as important agents of production and for improving their status in society.

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APPENDIX A

Appendix 5.1: WPR per 1000 for Rural Areas, West Bengal, different NSS Rounds.

NSS Rounds	<i>usual status (ps)</i>		<i>usual status (ps+ss)</i>	
	Rural Male	Rural Female	Rural Male	Rural Female
68 th (2011-12)	572	107	586	189
66 th (2009-10)	594	91	608	152
61 st (2004-05)	563	102	574	178
55 th (1999-00)	524	116	534	160
50 th (1993-94)	538	84	557	185

Source: GoI, 1997, 2000, 2006, 2011, 2013(NSS 50th, 55th, 61st, 66th and 68th Rounds on Employment and Unemployment).

Appendix 5.2: Results of ANOVA for Time Spent by Women according to Size Class-Samalbong

Activity	F-statistic/Brown-Forsythe statistic	Sig.
Crop Production	42.555	0.051
Livestock Rearing	2.198	0.119
Forage Collection	0.542	0.584
Household Work	0.221	0.802
Fetching Water	0.013	0.987
Fuel Collection	1.816	0.171
Social Participation	1.456	0.214
Other Income Generating Activities	0.765	0.47
Personal Time	2.163	0.123
Total Time	39.161	0.065

Appendix 5.3: Results of ANOVA for Time Spent by Women according to Size Class-Git Dubling Khasmahal

Activity	F-statistic/Brown-Forsythe statistic	Sig.
Crop Production	58.972	0.001
Livestock Rearing	4.311	0.017
Forage Collection	2.569	0.084
Household Work	0.167	0.846
Fetching Water	1.04	0.359
Fuel Collection	3.006	0.056
Social Participation	0.48	0.621
Other Income Generating Activities	0.092	0.912
Personal Time	0.464	0.631
Total Time	7.951	0.001

Appendix 5.4: Results of Post Hoc Test for Time Spent by Women in Crop Production according to Size Class-Git Dublin

Dependent variable: Crop Production						
Games-Howell						
size_class		Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
(I)	(J)				Lower Bound	Upper Bound
1.00	2.00	-.89530*	.25779	.010	-1.5713	-.2193
	3.00	-1.80450*	.36134	.000	-2.6965	-.9125
2.00	1.00	.89530*	.25779	.010	.2193	1.5713
	3.00	-.90920*	.37301	.047	-1.8072	-.0112
3.00	1.00	1.80450*	.36134	.000	.9125	2.6965
	2.00	.90920*	.37301	.047	.0112	1.8072

Appendix 5.5: Results of Post Hoc Test for Time Spent by Women in Livestock Rearing according to Size Class-Git Dublin

Dependent variable: Livestock Rearing						
Games-Howell						
size_class		Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
(I)	(J)				Lower Bound	Upper Bound
1.00	2.00	.35299	.27159	.456	-.5436	1.2496
	3.00	-.13153	.26569	.877	-1.0387	.7756
2.00	1.00	-.35299	.27159	.456	-1.2496	.5436
	3.00	-.48452*	.16782	.014	-.8867	-.0823
3.00	1.00	.13153	.26569	.877	-.7756	1.0387
	2.00	.48452*	.16782	.014	.0823	.8867

Appendix 5.6: Results of Post Hoc Test for Total Time Spent by Women according to Size Class-Git Dublin

Dependent variable: Total Time						
Games-Howell						
size_class		Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
(I)	(J)				Lower Bound	Upper Bound
1.00	2.00	-.67512	1.22839	.853	-5.4275	4.0773
	3.00	-2.26606	1.22689	.283	-7.0256	2.4935
2.00	1.00	.67512	1.22839	.853	-4.0773	5.4275
	3.00	-1.59094*	.42733	.001	-2.6149	-.5670
3.00	1.00	2.26606	1.22689	.283	-2.4935	7.0256
	2.00	1.59094*	.42733	.001	.5670	2.6149

Appendix 5.7: Results of ANOVA for Time Spent by Women according to Size Class-Sitong Khasmahal

Activity	F-statistic/Brown-Forsythe test	Sig.
Crop Production	1.758	0.178
Livestock Rearing	53.072	0.058
Forage Collection	81.926	0.011
Household Work	1.615	0.205
Fetching Water	0.715	0.492
Fuel Collection	88.986	0.036
Social Participation	89.092	0.352
Other Income Generating Activities	2.422	0.095
Personal Time	1.018	0.366
Total Time	0.564	0.571

Appendix 5.8: Results of Post Hoc Test for Time Spent by Women in Forage Collection according to Size Class-Sitong Khasmahal

Dependent variable: Forage Collection						
Games-Howell						
size_class		Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
(I)	(J)				Lower Bound	Upper Bound
1.00	2.00	-.18935	.20197	.619	-.6774	.2987
	3.00	-.58184*	.19275	.011	-1.0490	-.1146
2.00	1.00	.18935	.20197	.619	-.2987	.6774
	3.00	-.39249	.17588	.073	-.8140	.0290
3.00	1.00	.58184*	.19275	.011	.1146	1.0490
	2.00	.39249	.17588	.073	-.0290	.8140

Appendix 5.9: Results of Post Hoc Test for Time Spent by Women in Fuel Collection according to Size Class-Sitong Khasmahal

Dependent variable: Fuel Collection						
Games-Howell						
size_class		Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
(I)	(J)				Lower Bound	Upper Bound
1.00	2.00	.08608	.04104	.100	-.0128	.1850
	3.00	.11015*	.04097	.026	.0113	.2090
2.00	1.00	-.08608	.04104	.100	-.1850	.0128
	3.00	.02407	.04070	.825	-.0735	.1216
3.00	1.00	-.11015*	.04097	.026	-.2090	-.0113
	2.00	-.02407	.04070	.825	-.1216	.0735

APPENDIX B

Appendix 6.1: Iteration History^{a b c d} Model I (Dependent variable – FLFP)

Iteration		-2 Log likelihood	Coefficients								
			Constant	AGE	AGE_SQU	EDUCATION	FAMILY_STR(1)	CHILD_06(1)	MARITAL_STATUS(1)	OCCUPATION(1)	MIGRANT (1)
Step 1	1	195.441	1.317	.073	-.004	-.020	-.338	-.290	.337	.467	-.209
	2	185.277	1.717	.096	-.006	-.030	-.583	-.442	.536	.797	-.316
	3	184.627	1.838	.103	-.006	-.034	-.686	-.504	.612	.929	-.354
	4	184.622	1.850	.104	-.006	-.034	-.696	-.511	.619	.942	-.358
	5	184.622	1.850	.104	-.006	-.034	-.696	-.511	.619	.942	-.358

a. Method: Enter b. Constant is included in the model. c. Initial -2 Log Likelihood: 279.065 d. Estimation terminated at iteration number 5 because parameter estimates changed by less than .001.

Appendix 6.2: Iteration History^{a b c d} Model II (Dependent variable – FLFP_PAID)

Iteration		-2 Log likelihood	Coefficients									
			Constant	AGE	AGE_SQU	EDUCATION	FAMILY_STR(1)	CHILD_06(1)	MARITAL_STATUS(1)	OCCUPATION(1)	MIGRANT (1)	LAND
Step 1	1	171.806	-0.611	.009	-.001	.067	-.468	-.655	-.357	-.330	-.267	-.137
	2	153.196	-0.226	.008	-.002	.101	-.782	-1.324	-.568	-.526	-.599	-.348
	3	148.557	0.168	.004	-.003	.116	-.914	-1.872	-.625	-.592	-.886	-.597
	4	148.026	0.329	.001	-.003	.121	-.937	-2.124	-.634	-.605	-.976	-.732
	5	148.016	0.352	.001	-.003	.121	-.938	-2.164	-.636	-.608	-.983	-.755
	6	148.016	0.353	.001	-.003	0.121	-.938	-2.165	-.636	-.608	-.983	-.755

a. Method: Enter b. Constant is included in the model. c. Initial -2 Log Likelihood: 194.284 d. Estimation terminated at iteration number 6 because parameter estimates changed by less than .001.

Appendix 6.3: Contingency Table for Hosmer and Lemeshow Test- Model I (Dependent variable – FLFP)

		FLFP = .00		FLFP = 1.00		Total
		Observed	Expected	Observed	Expected	
Step 1	1	23	21.362	1	2.638	24
	2	13	16.006	11	7.994	24
	3	10	10.248	14	13.752	24
	4	6	5.880	18	18.120	24
	5	6	4.113	18	19.887	24
	6	3	2.958	21	21.042	24
	7	3	2.163	21	21.837	24
	8	2	1.600	22	22.400	24
	9	0	1.112	24	22.888	24
	10	0	.557	19	18.443	19

**Appendix 6.4: Contingency Table for Hosmer and Lemeshow Test- Model II
(Dependent variable – FLFP_PAID)**

		FLFP_PAID = .00		FLFP_PAID = 1.00		Total
		Observed	Expected	Observed	Expected	
Step 1	1	24	23.895	0	.105	24
	2	23	23.634	1	.366	24
	3	24	23.403	0	.597	24
	4	24	22.916	0	1.084	24
	5	21	22.503	3	1.497	24
	6	20	21.414	4	2.586	24
	7	21	20.269	3	3.731	24
	8	20	18.574	4	5.426	24
	9	17	15.885	7	8.115	24
	10	7	8.508	12	10.492	19

**Appendix 6.5: Tolerance, Variance Inflation Factor and Collinearity Diagnostics for
Model I (Dependent variable – FLFP)**

Variables	Tolerance	VIF	Dimension	Eigen value	Condition Index
EDUCATION	0.780	1.282	1	4.606	1.000
FAMILY_STR	0.935	1.070	2	1.366	1.836
CHILD_06	0.828	1.207	3	0.848	2.330
MARITAL_STATUS	0.862	1.161	4	0.624	2.718
OCCUPATION	0.941	1.062	5	0.553	2.887
MIGRANT	0.949	1.054	6	0.384	3.462
AGE	0.629	1.589	7	0.335	3.708
AGE_SQU	0.784	1.275	8	0.215	4.632
Mean of VIFs		1.213	9	0.069	8.169

**Appendix 6.6: Tolerance, Variance Inflation Factor and Collinearity Diagnostics for
Model II (Dependent variable – FLFP_PAID)**

Variables	Tolerance	VIF	Dimension	Eigen value	Condition Index
EDUCATION	0.769	1.300	1	5.215	1.000
FAMILY_STR	0.904	1.106	2	1.372	1.950
CHILD_06	0.809	1.236	3	0.894	2.416
MARITAL_STATUS	0.862	1.161	4	0.652	2.829
OCCUPATION	0.875	1.143	5	0.557	3.061
MIGRANT	0.945	1.058	6	0.385	3.678
AGE	0.629	1.590	7	0.356	3.828
AGE_SQU	0.784	1.275	8	0.287	4.262
LAND	0.861	1.161	9	0.215	4.929
Mean of VIFs		1.226	10	0.068	8.737

APPENDIX C

**Appendix 7.1: Tolerance, Variance Inflation Factor and Collinearity Diagnostics for
Time Spent by Women in Agriculture**

Variables	Tolerance	VIF	Dimension	Eigen value	Condition Index
AGE	0.622	1.608	1	6.567	1.000
AGE_SQU	0.752	1.330	2	1.386	2.177
EDUCATION	0.762	1.312	3	0.910	2.686
FAM_STR	0.895	1.118	4	0.670	3.131
MARITAL_STATUS	0.845	1.184	5	0.562	3.420
OCCUPATION_HEAD	0.850	1.176	6	0.474	3.722
MIGRANT	0.940	1.063	7	0.381	4.151
LAND	0.724	1.380	8	0.322	4.514
TIME_MALES	0.694	1.441	9	0.300	4.680
CHILD_06	0.785	1.274	10	0.222	5.442
MPCE	0.831	1.203	11	0.149	6.648
Mean of VIFs		1.281	12	0.058	10.615

Dependent Variable: TIME_AGRI

APPENDIX D

Women's Involvement in Different Activities in the Surveyed Villages





Process of Interviewing



Typical Rural Kitchen



Process of Making *paneer* (Cottage cheese)



Cardamom Fields



Storing fuelwood

APPENDIX E

Women's Labour Force Participation in Mountain Farming Systems with Special Reference to the Darjeeling Hills of West Bengal

Village Name..... Date

Sub-Division Block.....

Mouza..... Gram Panchayat.....

GENERAL INFORMATION

1. (a) Respondent's Name.....(b) Age(no. of completed years)
2. Religion: Hindu/ Muslim/ Christian/ Buddhist/Other.....
3. Sub Community: SC/ ST/ OBC/ Others
4. Mother Tongue.....
5. Current Marital Status: Single/ Married/ Widowed/ Separated/ Divorced
6. Educational Level: Illiterate/Functionally Literate/Up to Class IV/Up to Class VIII/ Madhyamik/Higher Secondary/ Graduation/Post Graduation/Technical.....(Specify)
7. Principal activity of respondent (Activity on which maximum time is spent in the last 356 days).....
8. Subsidiary activity respondent (Activity on which relatively less time is spent, not less than 30 days)
9. (a) Head of Household (Highest Income Earning Member).....
(b) Age (in no. of completed years)..... (c) Sex: Male/Female (d) If female headed household, Reason: Single/Widowed/Separated/Divorced/Male out-migration.
10. Principal activity of household head (Activity on which maximum time is spent in the last 356 days).....
11. Subsidiary activity household head (Activity on which relatively less time is spent, not less than 30 days)

HOUSEHOLD CHARACTERISTICS

12. (a) Family Status: Unitary/ Joint (b) Earning Status of Household: Sole/Joint
13. (a) Size of household..... (b) Male..... (c) Female..... (d) Children below 6 years...
14. Particulars of household members

Sl. No.	Name	Age	Sex (M/F)	Relation with respondent	Education	Marital Status	Principal activity	Subsidiary activity

15. (a) Potable Water Sources: Spring Water/ Domestic Tap/ Community Tap/ Others
(Specify).....

16. (a) Household fuel sources

Type	Weekly/Monthly Amount Used	Weekly/Monthly Cost	Available from
Fuel wood			
Kerosene			
Coal			
LPG			
Others			

17. (a) House Type: Pucca/ Semi Pucca/ Kutcha (b) House Description: No. of rooms.....

18. Household Assets and No. of: (a) Television(b)Satellite Television/DTH.....

(c)Mobile Phone..... (e)Motor Vehicle.....(f)Refrigerator.....(g)Any others

(Specify).....

ECONOMIC INFORMATION-INCOME AND EXPENDITURE

19. Source of Income

Source of Income	Monthly	Annually	Any other information
Sale of Agricultural Products			
Sale of Craft Items			
Sale of Milk and Milk Products			
Sale of Eggs and Poultry/Farm Animals			
Rent of House			
Rent of Land			
Remittance from Family Members (Working Outside the place of residence)			
Salaries Drawn			
Daily Wages Drawn (From Agriculture)			
Daily Wages Drawn (From Construction)			
100 days Employment programme (MGNREGA)			
Any Others (Specify)			
Total			

20. Household Expenditure

(a). Expenditure on Food

Items	Quantity (Monthly)	Quantity (Annually)	Expenditure in Rs. (Monthly)	Expenditure in Rs. (Annually)
Food Items (Rice, dal etc.)				
Vegetables and Fruits				
Milk and Milk Products				
Meat, Fish. Eggs etc.				
Any Other				

(b). Other Household Expenditure

Items	Expenditure in Rs. (Monthly)	Expenditure in Rs. (Annually)
Household Fuel		
Education of Children		
Medical Expenses		
Clothing		
Other Household Expenditure		
Electricity charges		
Rent of House (If not owned)		
Water		
Taxes, if any		
Others		

(c) Expenditure on Agriculture and Maintenance of Animals

Items	Quantity/ Number	Cost in Rs.	Expenditure in Rs. (Monthly)	Expenditure in Rs. (Annually)
Purchase of agricultural implements				
Purchase of seeds				
Purchase of Fertilizers/Insecticides				
Wages to hired labour				
Animal Feed				
Others				

INFORMATION ON AGRICULTURAL ACTIVITIES

21. (a) Land Holding acres (b) Name of owner.....

22. Land Utilization (acres): Total Land.....
Cultivated Land.....
Irrigated Land
Non-Irrigated Land.....
Leased In Land.....
Leased Out Land.....
Homestead.....
Fallow.....
Others.....

23. Reasons for fallow land, if any

24. Have there been any changes in cropping pattern over the last five years? Reasons if any,
.....

25. Main Crops Grown (including fruits and vegetables)

Name of the crop	Area Sown	Seed Type HYV/ Traditional	Output in kgs (Annually)	Marketed in kgs	Marketed Value (Rs/kg)	Amount for Self Consumption in kgs	Sowing and Harvesting season	Place where it is sold
							S- H-	
							S- H-	

26. Is the land cultivated by: Family Labour/ Hired Labour/ Any Other (Specify).....

27. Labour utilization: (a) Family Labour Male..... Female.....

(b)Hired Labour..... Male Female

28. (a) Are there any differences in crops cultivated by the different categories of labour?

Yes/No

(b) If yes, what are the crops cultivated by the different categories of labour ?

Family LabourHired Labour

(c)Wages paid to hired labour: Male.....Female.....

29. Role in Agricultural Activities

Activity	Work Done By and No. of Hours worked /day Family Labour			Work Done By and No. of Hours worked /day Hired Labour			Any other information
	Name	Hrs/ day	No. of days worked/year	M/F	Hrs/ day	No. of days worked/year	
Clearing Land							
Seed							
Ploughing							
Sowing							
Uprooting of Seedlings/ Transplanting							
Watering							
Application of Manure							
Weeding							
Harvesting							
Sun Drying							
Grading and Storing							
Seed Storing							
Weighing							
Marketing							
Any Others							

30. Agricultural Implements Owned

Type	Quantity	Operated By: Male/Female/Both

31. Main Source of Manure.....

32. Chemical fertilizers/ insecticides, if used

Name of fertilizers / Insecticides	Crops	Amount in kgs	Purchased From	Other Information

33. (a) Are the fields irrigated / rain fed?

(b) If irrigated, what is the source of irrigation?.....

(c) Irrigated crops (d) Rain fed crops?.....

(e) What are the problems related to supply of irrigation facilities?

34. (a) Have any programmes been organized to train farmers? Yes/ No.

(b) Have you attended any such programme? Yes/No

(c) If yes, how many..... When.....

(d) If no, why?

(e) Has any other family member attended such programme? When and why?

.....

(f) Explain briefly about the programme

(g) Was the information useful? Yes/No

(h) Are you utilizing the information obtained in the programme practically? Yes/No

(i) Are there other areas which should have been covered in the training programme?

.....

(j) Do you think more training programmes should be organized in the future? Yes/No

(k) Why?

35. Any other farm based activity (Bee keeping/fish farming/ sericulture/ etc.)

ANIMAL HUSBANDRY

36. Animals Owned

Name	Number	Self Consumption	Amount for Sale	Value of Marketed Product	Any other Information
Cow (Milk, butter)					
Goats/ Pigs (Milk, Meat etc.)					
Poultry (Eggs, meat etc.)					
Others					

37. Role in Animal Husbandry:

Activities	Work Done By and No. of Hours			Other Information
	Name	No. of hours/ day	No. of days in a year	
Stall Feeding				
Forage/ Fodder Collection				
Milk Extraction				
Cleaning Shed				
Taking Care of Animals				
Collecting Manure				
Marketing of milk				
Purchasing Feed				

OTHER ACTIVITIES

38. Role in Domestic and other household activities

Activity	Work Done By and No. of Hours			Other Information
	Name	No. of hours/day	No. of days/ year	
Cooking				
Washing /Cleaning				
Cleaning the Household				
Fetching Water				
Fuel Collection				
Looking after Children (Feeding, bathing etc.)				
Taking children to school				
Helping children with daily lessons				
Looking after the aged members, if any				
Participating in social functions like marriage, death etc., attending meetings of SHGs/ other village committees etc.				
Purchase of food and other household articles				
Any Other				

39. Other Income Generating Activities

Activity	Work done by and No. of hours			Other information
	Name	No. of hours/day	No. of days/year	
Regular Wage work (Office employee,				
Self employed (Carpentry, tailoring etc.)				
Self-owned shop				
Construction (MGNREGA or other activities like overseer				
Agricultural Labour on others' field				
Any other				

40. Personal Activities

Activity	No. of hours			Other information
	Name	No. of hours/day	No. of days/year	
Personal care (washing, bathing etc.)				
Watching Television/ listening to radio				
Rest and relaxation				
Religious activities				
Any other				

MISCELLANEOUS INFORMATION

41. (a) Are you a member of self-Help Group or any other village committees? Yes/ No.

(b) Other family member who are also members of such groups?

(c) How often do you attend meetings conducted by such groups?

(d) Any productive activity is undertaken by such groups?

42. (a) Have any loans been taken? Yes/No

(b) When? From Where?.....

(c) How many times?

- (d) In whose name loan has been sanctioned?.....
- (e) If debtor is male, why so?
- (f) Loan Amount.....
- (g) Purpose of Loan.....
- (h) Whether repaid or not? Yes/No

43. (a) Monthly Savings Rs.....
- (b) What do you do with the savings? Deposit in Bank/ Kept at Home for Future Use?
 - (c) Do you have a bank/post office account? Yes/No
 - (d) Single/Joint with husband?
 - (e) Does any other family member have a bank account? Yes/ No.
 - (f) If yes, how many?
 - (g) If you don't have a bank/post office account where do you save your money?
.....

44. (a) Educational aspiration for children:
- Girl children: Nil/ Primary/Secondary/HS/Higher
 - Boy children: Nil/Primary/Secondary/HS/Higher
- (b). Work aspiration for children:
- Girl children
 - Boy children

45. Any other Observations

.....

.....

.....

.....

.....

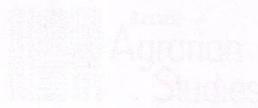
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**CHILD WELL-BEING,
SCHOOLING AND
LIVING STANDARDS**

Village-Based Reports
from Three States

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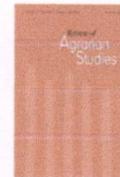
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Covariates of Rural Female Work Participation: A Study of the Hill Region of Darjeeling District in West Bengal, India

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Abstract: Women's labour market decisions depend greatly on decisions taken at the household level. These decisions in turn are determined by social, economic, demographic, personal, religious, and cultural factors. This study investigates and identifies the covariates of rural female work participation using primary survey data from 2016–17 for three villages in the hill region of Darjeeling district (including Kalimpong sub-division) in the State of West Bengal. Based on a sample of 235 rural women, the study estimates two models using logistic regression analysis. We observe that women's participation in paid activities is significantly and positively related to the level of education, and significantly and negatively related to joint family structure, the presence of children below the age of six, and the extent of household landholding. For both paid and unpaid work on family farms, we observe that age has a non-linear effect on women's participation. Women belonging to a unitary family structure and agricultural households are more likely to participate in paid and unpaid work as family labour, controlling for other variables.

Keywords: Female work participation, rural, hill districts, paid work, unpaid work, covariates, West Bengal, Darjeeling.

INTRODUCTION

Women's decision to participate in the labour market and the nature of work in which they are engaged are influenced by decisions taken at the household level and depend on several factors. The members of a family divide among themselves paid work, unpaid housework (including cooking, cleaning, and washing), and care work (care of small children and the elderly) to suit household requirements. This division of work depends on a variety of factors, such as individual beliefs about appropriate gender roles and child-rearing practices, as well as perceptions about the value of women's contribution. These perceptions in turn are influenced and shaped by the relative bargaining power of household members, which are affected by potential income, human capital, economic dependency, potential status of employment, as well as specific household needs and interests (ILO 2012, p. 35).

Despite significant contributions to the functioning of an economy, the female labour force in less-developed countries continues to be neglected and underutilised, making it a socially and economically disadvantaged human resource. This has obvious implications for economic welfare and growth (Psacharopoulos and Tzannatos 1989).

The attitude of society . . . towards what constitutes woman's work and her place in society . . . held not only by men but by women themselves and reflected in national data systems, exclude large numbers from the estimation of the workforce and consider them to be non-employed, not wishing to participate in the labour market (Sundar 1981).

The underestimation of women's work is a result of women's relatively high involvement in unpaid work, which lacks visibility. "Since status in contemporary society is so often equated with income-earning power, women suffer a major undervaluation of their economic status" (UNDP 1995, p. 6). "Within the family" it "determines the hierarchy in gender relations . . . and acts as the mainspring of gender inequalities" (ActionAid 2017, p. 15). Agarwal (1997) notes that the debate within Western feminism on "wages for housework" was based on the recognition that unpaid work was "invisible" and perceived as "possessing little value." England and Kilbourne (1990) use studies of American households to argue that women who earn have greater bargaining power than women who are solely housewives, because of, among other things, the cultural devaluation of housework (Agarwal 1997). Women's entry into wage labour is thus one way of increasing intra-family bargaining power, not only directly, but also by increasing the perceived legitimacy of their claims (*ibid.*; see also Sen 1990).

The participation of women in paid work, however, may not always be empowering. Chakraborty and Chakraborty (2009) point out that increased labour force participation by women as a response to economic stress may lead to young girls dropping out of school and being put to work at domestic chores and sibling care; the burden of work imposed on girls early in life may restrict their schooling, which in turn widens the gender gap in education and the gap in labour market opportunities. This implies that women may be employed in jobs that are of lower productivity and casual in nature (that is, not in regular contracts). Gender roles within the household thus translate into gender stratification in the labour market.

Participation of women in the labour force is a function of a wide range of factors, among which non-economic factors are also significant. Women's involvement in paid work is determined by factors as diverse as demographic, reproductive, social, religious, cultural, and personal factors (Sundar 1981; Srivastava and Srivastava 2010). There is considerable heterogeneity in female labour force participation rates across regions and nations. Standing (1981) observes that "any generalisation about female labour force participation is liable to be misleading, since level, patterns, and trends vary widely between and within countries" (*op. cit.* Psacharopoulos and Tzannatos 1989). Female labour force participation thus requires analysis within the socio-economic and demographic context of the area under study.

Research on the relatively high work participation rates of women in the hill and mountain regions of India is somewhat limited. According to the 2011 Census, the rural female work participation rate for the hill district of Darjeeling (including Kalimpong sub-division) in the State of West Bengal was 26 per cent, which was the third highest among all districts of the State and higher than the State average of 19.4 per cent. Lack of caste-specific occupational specialisation, higher cost of living, and low productivity of land have been identified as some of the reasons for the high rate of work participation in Darjeeling district as compared to other districts in West Bengal (Subba 1985, p. 20). The gender division of labour, which is weaker in highland areas, may also contribute to high female work participation in Darjeeling district. Agricultural activities in the hill regions are often conducted for subsistence and are distinctly different from those practised in lowland areas, due to limitations imposed by altitude and topography. In such settings, women's participation in economic activities is affected by several factors that have received little attention from scholars. Keeping this in mind, the present study examines the contribution of rural women in the hill region in Darjeeling district (including Kalimpong sub-division) in the State of West Bengal, by taking into account paid work and unpaid work in family farms, and identifying the determinants of work participation.

STUDY AREA, DATA, AND CHARACTERISTICS OF THE STUDY VILLAGES

The study examines the determinants of work participation for women in the rural hill regions of West Bengal. It is based entirely on primary data collected as part of a survey conducted in hill regions of Darjeeling district (including Kalimpong sub-division) in 2016–17. Kalimpong was accorded the status of a district only on February 14, 2017, and was therefore a sub-division of Darjeeling district at the time of survey.

The former district of Darjeeling comprised four sub-divisions: Darjeeling Sadar, Kurseong, Kalimpong, and Siliguri. The first three of these sub-divisions are in the hill areas and the fourth is in the plains. Siliguri sub-division is excluded from the present study as it is not a hill area. Among the three hill sub-divisions of Darjeeling district, Darjeeling Sadar and Kalimpong (now a district) had three community development blocks each, and Kurseong sub-division had two community development blocks. For purposes of the survey, one community development block each, with a higher-than-average proportion of agricultural workers, was chosen from the sub-divisions of Darjeeling Sadar and Kalimpong, and Kurseong block was chosen from Kurseong sub-division because of its proximity to the town. The village with a relatively high proportion of agricultural workers was selected randomly from each block. The villages selected for the survey were Samalbong in Darjeeling Sadar, Git Dubling Khasmahal in Kalimpong, and Sitong Khasmahal in Kurseong.¹

Table 1 shows the socio-economic and demographic characteristics of the three sample villages. The villages are primarily agrarian in character. While 70 per cent of heads of household reported agriculture as their primary activity in Git Dubling Khasmahal village, the corresponding proportions in Samalbong and Sitong Khasmahal were lower, at 38 and 44 per cent respectively. Table 2 shows the structure of female employment (usual primary activity status) in the three sample villages. It is clear that among economically active women, the proportion of women involved in agriculture was higher than those engaged in non-agricultural activities, with agricultural workers displaying a higher proportion of self-employed. The labour exchange system of "parma" that exists in some of the hill areas is a major reason for the low percentage of agricultural workers.² Non-agricultural activities in the villages included petty trade, working in government offices, as mid-day meal cooks, as Integrated Child Development Scheme (ICDS) helpers, and in teaching. The principal crops in the villages were black cardamom, broom grass, potato, round red chilli, seasonal vegetables such as squash, beans, green leafy vegetables, and maize, paddy, and pulses at lower altitudes. Livestock-rearing was an important aspect of mountain farming, and primarily served as a source of manure. It also supplemented family income, especially in times of distress.

Table 1 Socio-economic and demographic characteristics of sample villages, 2016–17

Village	Samalbong	Git Dubling Khasmahal	Sitong Khasmahal
A. Demographic factors			
1. Population			
Males	117	127	128
Females	113	108	136
2. Age			
Mean age of men	30.7	32.6	34.1
Mean age of women	30.7	37	33.8
B. Social factors			
1. Family structure			
Unitary family (percentage)	68	54	32
Joint family (percentage)	32	46	68
Average number of children (0–6 years)	0.9	1	0.66
2. Literacy			
Male literacy	88.3	94.1	95
Female literacy	83	86.7	85.2
3. Marital status			
Married males	59.1	70.7	54.7
Married females	62.6	71.7	52.9
C. Economic factors			
1. Primary activity of household heads			
Agriculture (per cent)	38	70	44
Non-agriculture (per cent)	62	30	56
2. Labour force characteristics			
Work participation rate of males	51	59.8	56.3
Work participation rate of females	41.6	52.8	47.8
3. Landholding of households			
Average landholding (acres)	1.4	2.8	1.7
4. Monthly income of households			
Average monthly income (Rs)	11,347	22,814	15,860

Source: Primary survey data.

Table 2 Usual principal activity status of women in the study villages, by type of employment, 2016–17 in number and per cent

Activity	Samalbong	Git Dubling Khasmahal	Sitong Khasmahal	All
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Activity	N6samalborg		NGit Dubling Khasmahal		NGitong Khasmahal		No.	All	%
	No.	%	No.	%	No.	%			
Agriculture, of which	34	73.3	47	82.5	57	87.7	138	81.7	
1 Self-employed	32	94.1	47	100	56	98.2	135	97.8	
2 Agricultural labour	2	5.9	0	0	1	1.8	3	2.2	
3 Allied activities	0	0	0	0	0	0	0	0	
Non-agriculture, of which	13	27.7	10	17.5	8	12.3	31	18.3	
1 Self-employed	4	30.8	4	40	3	37.5	11	35.5	
2 Regular wage/salaried	9	69.2	6	60	5	62.5	20	64.5	
3 Casual	0	0	0	0	0	0	0	0	
Total (Agriculture+Non-agriculture)	47	100	57	100	65	100	169	100	

Source: Primary survey data.

Fifty households were surveyed in each village. Information was collected through in-depth interviews of female respondents. The respondents were asked about the activities in which female members of the households, including themselves, participated. Information on other socio-demographic characteristics of the households was also collected. Only women between the ages of 15 and 65 were considered for the analysis, irrespective of whether or not they participated in an economic activity. Females attending educational institutions were excluded from the analysis. The total sample size was 235 (68 in Samalborg village, 74 in Git Dubling Khasmahal, and 93 in Sitong Khasmahal). The data were analysed using Statistical Package for the Social Sciences (SPSS) version 23 and Econometric Views (EViews) version 10.

The Employment and Unemployment Survey of the National Sample Survey Organisation (NSSO), 68th Round, defines economic activity as "any activity resulting in production of goods and services that add value to national product," and includes activities such as "(i) production of all goods and services for the market (i.e. for pay or profit) including government services, (ii) production of primary commodities for own consumption, and (iii) own account production of fixed assets" (GoI 2013). Further, an activity on which a person spent a relatively long period of time (i.e. major time criterion) during the 365 days preceding the date of survey is considered as the *usual principal activity status* of the person, whereas the status in which an economic activity was pursued for a relatively shorter time, amounting to not less than 30 days during the reference year, is the *subsidiary economic activity status*. In the present study, the work participation of women is based only on *usual principal activity status*, i.e. a woman is said to be in the workforce according to the *usual status* (primary activity status) if she participates in any kind of activity for the major part of the 365 days preceding the survey. Women who are primarily engaged in household work and participate in economic activities on *usual subsidiary activity status* are considered to be outside the workforce. Unemployed women are not included in the workforce. The workforce therefore includes women in paid employment and those who work as unpaid family labour on family farms.

Following Ackah *et al.* (2009), two alternative models have been estimated in the present analysis on the basis of female workforce participation. Model I takes into consideration both paid and unpaid employment of women as participation in the workforce. It includes women in paid/wage work or self-employment, as well as those engaged in family farms as unpaid family labour. In order to arrive at the determinants of women's paid work, Model II considers a more restrictive definition of participation that includes only paid market work, but covers both wage work and self-employment. Paid market work may be distinguished from unpaid work as "work that is remunerated in cash or kind in the shape of wages, salaries, and profit" whereas unpaid work is work "performed without any direct remuneration" (ActionAid 2017, p. 13).

Table 3 shows that out of 235 working-age women, 169 (71.9 per cent) participated in economic activities. Model I includes these 169 women. Model II, which takes into account only paid activities of women, includes only 34 women (14.5 per cent) who participated in paid economic activities.

Table 3 Frequency table for the binary response variable (Model I dependent variable – FLFP and Model II dependent variable – FLFP_PAID)

	Frequency	Percentage	Valid percentage	Cumulative percentage
Model I				
	FLFP=0	66	28.1	28.1
Valid	FLFP=1	169	71.9	100
	Total	235	100	
Model II				
	FLFP_PAID=0	201	85.5	85.5
Valid	FLFP_PAID=1	34	14.5	100
	Total	235	100	

Notes: (i) FLFP is defined as paid work and unpaid work on family farms.

(ii) FLFP_PAID is paid market work, or work that is remunerated in cash or kind in terms of wages, salaries, and profit. It includes both wage work and self-employment.

METHODOLOGY

Variables Used in the Binary Logistic Regression Model

A review of the literature shows that various socio-economic variables influence the work participation behaviour of women. Table 4 lists the explanatory variables chosen for analysis along with the expected sign. Age squared has been used to capture the non-linear effect of age. It is, however, very likely that the age and age-squared terms are highly correlated.³ In the present analysis, age has been centred to reduce multicollinearity. The monthly per capita consumption expenditure of the household has been used as a proxy for household income to avoid the problem of endogeneity in the model. The expenditure incurred by a household on domestic consumption during the reference period is taken as the household's consumption expenditure (GoI 2014, p. 8). In the present model, household expenditure on food items was estimated per month. For self-produced items such as vegetables and milk, the quantity consumed per month was recorded and the value estimated according to the prevailing market price. Expenditure on other items such as clothing, education, and agricultural inputs was

estimated using a one-year recall period. Recall errors are an inherent limitation of the present study. We measured household monthly per capita consumption expenditure (MPCE) as a continuous variable in thousand rupees.

Table 4 Variables used in the model

Variable	Notation	Description	Expected sign
Dependent variable			
Model I: Female work participation	FLFP	Dummy variable =1 if participating in the workforce =0 otherwise	
Model II: Female work participation in paid work	FLFP_PAID	Dummy variable =1 if participating in the paid workforce =0 otherwise	
Independent variables			
Age	AGE	Number of years completed	Positive
Age squared	AGE_SQU	Square of the number of years completed	Negative
Education	EDUCATION	Number of years of schooling	Positive
Family structure	FAM_STR	Dummy variable =1 joint = 0 unitary	Positive/Negative
Number of children below the age of six	CHILD_06	Dummy variable =1 if child below the age of six years is present = 0 otherwise	Negative
Woman's marital status	MARITAL_STATUS	Dummy variable=1 if currently married =0 otherwise	Negative
Primary occupation of household head	OCCUPATION_HEAD	Dummy variable=1 if primary occupation is agriculture =0 otherwise	Positive
Presence of male migrant member	MIGRANT	Dummy variable=1 if migrant male member is present =0 otherwise	Positive/Negative
Monthly per capita consumption expenditure	MPCE	Monthly per capita consumption expenditure of household in Rs 1,000	Negative
Landholding	LAND	Ownership holding of household in acres	Positive/Negative

Details of the specifications of the logistic regression model, the selection of variables, and the results from the analysis of the data are in the Appendix.

Results from the Logistic Regression

The *p*-values of the Wald statistics in Table 5 show that the variables that are significant in explaining female labour force participation as per Model I are AGE, AGE_SQU, FAM_STR, and OCCUPATION_HEAD.

Table 5 Binomial logistic regression estimates for female work participation – Model I

		Variables in the equation – Model I							
		B	S.E.	Wald	df	Sig.	Exp(B)	95 per cent C. I. for EXP(B)	
								Lower	Upper
	AGE	0.104	0.021	24.884	1	0.000*	1.109	1.065	1.155
	AGE_SQU	-0.006	0.001	23.323	1	0.000*	0.994	0.991	0.996
	EDUCATION	-0.034	0.041	0.702	1	0.402	0.966	0.891	1.047
	FAMILY_STR(1)	-0.696	0.394	3.122	1	0.077***	0.498	0.230	1.079
Step 1a	CHILD_06(1)	-0.511	0.496	1.062	1	0.303	0.600	0.227	1.586
	MARITAL_STATUS(1)	0.619	0.445	1.938	1	0.164	1.857	0.777	4.441
	OCCUPATION_HEAD(1)	0.942	0.385	5.980	1	0.014**	2.566	1.206	5.459
	MIGRANT(1)	-0.358	0.447	0.639	1	0.424	0.699	0.291	1.681
	Constant	1.850	0.587	9.948	1	0.002**	6.361		

Notes: * significant at $\alpha = 0.001$, ** significant at $\alpha = 0.050$, and *** significant at $\alpha = 0.100$.

Variable(s) entered for step 1: AGE, AGE_SQU, EDUCATION, FAM_STR, CHILD_06, MARITAL_STATUS, OCCUPATION_HEAD, MIGRANT

The variables that are significant in explaining women's work participation in paid activities (Model II) are EDUCATION, FAM_STR, CHILD_06, and LAND (Table 6).

Table 6 Binomial logistic regression estimates for female work participation – Model II

		Variables in the equation							
		B	S.E.	Wald	df	Sig.	Exp(B)	95 per cent C. I. for EXP(B)	
								Lower	Upper
Step 1a	AGE	0.001	0.027	0.001	1	0.973	1.001	0.950	1.055
	AGE_SQU	-0.003	0.002	1.928	1	0.165	0.997	0.993	1.001

	Variables in the equation						95 per cent C. I. for EXP(B)	
	B	S. E.	Wald	df	Sig.	Exp(B)	Lower	Upper
	EDUCATION	0.121	0.048	6.362	1	0.012**	1.129	1.027
FAMILY_STR(1)	-0.938	0.458	4.185	1	0.041**	0.392	0.159	0.961
CHILD_06(1)	-2.165	1.075	4.059	1	0.044**	0.115	0.014	0.943
MARITAL_STATUS(1)	-0.636	0.511	1.546	1	0.214	0.530	0.194	1.443
OCCUPATION_HEAD(1)	-0.608	0.435	1.955	1	0.162	0.545	0.232	1.276
MIGRANT(1)	-0.983	0.667	2.176	1	0.140	0.374	0.101	1.382
LAND	-0.755	0.278	7.409	1	0.006**	0.470	0.273	0.809
Constant	0.353	0.687	0.263	1	0.608	1.423		

Notes: ** significant at $\alpha = 0.050$.

Variable(s) entered on step 1: AGE, AGE_SQU, EDUCATION, FAM_STR, MARITAL_STATUS, OCCUPATION_HEAD, MIGRANT, LAND.

Interpretation of the Results

Scholars have cited age as an important determinant of female participation in the workforce. Due to simultaneous demands made by children and at work, participation by women in the workforce during periods of child-bearing and child-rearing is likely to be lower than that of older women who are beyond this age (Psacharopoulos and Tzannatos 1989). Female participation is expected to peak before the onset of child-bearing and a few years after the months of child-bearing, and decline during child-rearing (Mon 2000). Reddy (1979) notes that although, clearly, urban female activity rates are negatively associated with child-bearing and child-rearing age-groups, no such association is evident in rural areas. A possible explanation for this could be the predominance of the joint family system in rural areas, in which older women of the family take up the responsibility of child-rearing with older siblings also helping in the process (Reddy 1979). In Model I, AGE has a significant positive impact on female workforce participation whereas AGE_SQU has a negative significant effect, which shows the non-linear effect of age. Increase in age is associated with increased work participation up to a certain age, beyond which work participation decreases. This implies that younger women – who perform a greater share of household duties, as well as child-bearing and child-rearing activities – and older women are less likely to be in the workforce, as compared to middle-aged women. When we consider women's paid employment (Model II), however, the age of the respondent is not significant in explaining female work participation in the study areas.

Although theoretically a positive correlation has been postulated between levels of education and female labour force participation, empirical findings from developing countries present mixed results (Standing 1981, cited in Ackah *et al.* 2009). In some cases, education and female participation rates show only a marginal or non-linear relationship (Mon 2000). According to a study by Psacharopoulos and Tzannatos (1989), education has an ambiguous effect on women's participation in the labour force. Labour force participation rates are affected by the decision to participate in the labour market and the amount of time spent in the labour market.

Empirical studies also show that female labour participation is more responsive to wage (substitution effect) than to income; hence, the participation of educated women in the workforce is greater than the participation of women with little education (Psacharopoulos and Tzannatos 1989). In rural areas, non-farm paid jobs available to those with little education are equivalent to casual wage labour, where there is little association between wage levels and years of education. Education raises the reservation wage for these women by raising the productivity of time spent on their own farm and home production, which results in lower participation in wage/paid employment if the local labour market does not provide better opportunities (Unni 1994). This implies that women with some education may prefer to remain outside the labour market altogether, preferably doing household work or working on family farms as unpaid family labour in the absence of remunerative non-farm employment opportunities. A negative association between the level of education and female labour force participation in paid activities may thus be postulated in rural areas.

In the present analysis, the coefficient of education as measured by the number of years of schooling is negative but does not significantly affect female work participation rates in Model I. Since work participation in Model I includes both paid and unpaid activities, it is plausible that the level of education may weakly determine women's participation in the workforce. In Model II, however, it is positive and statistically significant. The value of Exp (B) for EDUCATION in Model II is 1.129; that is, with a one-year increase in the number of years of schooling, the participation of women in paid employment increases by a factor of 1.129, or 12.9 per cent. An implication of this finding is that though the level of education has a non-significant effect on the work participation decisions, both paid and unpaid, of women, the level of education of women who are in paid employment is higher than those who are not. This also implies that women with a higher level of education are employed in non-farm jobs, as employment in agriculture is primarily as unpaid family labour.

In joint families with a large number of family members, a dichotomy is visible between men's work and women's work, with males being involved in paid activities and females in domestic activities. On the other hand, women of working age in joint families are helped in their domestic activities and child care by older women and other female members of the household (Reddy 1979), which in turn increases their participation in paid activities or agricultural activities on the family farm. In the study area, family structure (FAM_STR) is a dummy variable with the variable taking a value of 1 if the respondent belongs to a joint family and 0 otherwise. The coefficient for this dummy is negative and statistically significant for both models, indicating that a respondent who belongs to a joint family as compared to a nuclear family was less likely to be in the workforce. In Model I, the odds of participating in work for a respondent from a joint family decreased by a factor of 0.498 or 50.2 per cent, whereas in Model II, the odds decreased by a factor of 0.392 or 60.8 per cent. If there is a single earning member in a nuclear family, generally the husband, the wife is likely to work alongside him to supplement family labour on the farm or supplement family income through participation in paid activities. This explains the higher participation in the workforce of women belonging to nuclear families.

The presence of children may have a negative effect on women's participation in economic activities (Chaykowski and Powell 1999). Younger children especially, i.e. children below the age of six, may cause women to spend more time in child care while the presence of older children may reduce their work burden. Cohen (1970) found that the presence of a child under the age of six was the most significant factor that determined labour force participation of married women (Anderson and Dimon 1998). In rural areas the presence of young children may not pose that much of a problem for women's participation in agricultural activities, as older female children and female members of the household help with domestic work and childcare while older male children assist in some agricultural activities. However, the spread of primary and secondary education has meant that school-going children cannot help in childcare as before.

As mentioned above, in nuclear families the presence of small children, particularly below the age of six, may hinder a woman's participation in economic activities. In the present study, the presence of children below the age of six was represented by the dummy variable CHILD_06, with the presence of one or more children below the age of six in the household being denoted by 1 and their absence by 0. In Model I, the presence of children under six years has a negative effect on female participation rates, but the results are not statistically significant. In Model II, however, the variable has a significant negative effect. The results indicate that for women with children less than six years of age, the odds of participating in paid work decreased by a factor of 0.115, or 88.5 per cent. Since paid work involves working away from the vicinity of the household as opposed to unpaid work on family farms, taking care of young children may hinder women's participation in paid work.

The marital status of the respondent was another major influence on female labour force participation, as married women had greater household responsibilities than unmarried women (Mon 2000), which restricted their participation in the labour force. Being married influenced women's decision-making ability, but increased the value of non-market activities. Women were expected to become mothers and home-makers, while men were viewed as breadwinners and heads of the household within patriarchal family structures (Blau *et al.* 1998, p. 13; Lisaniler and Bhatti 2005). Since such patriarchal family structures are widely prevalent in Indian society, marriage is expected to reduce the participation of women in labour market activities. We grouped the respondents into two categories: those currently married and those who were single/widowed/divorced/separated. The variable of marital status (MARITAL_STATUS) is a dummy with single/widowed/divorced/separated being the reference category. The results of the analysis show that for Model I, although the coefficient is positive, it is non-significant. For Model II, the coefficient is negative, implying that women in the single/widowed/divorced/separated category participated more in paid employment, but this is insignificant.

The decision of women to participate in the workforce is also influenced by the work status of their husbands. Women whose husbands have no source of income are more likely to work for cash, while those whose husbands are self-employed are more likely to work as unpaid family workers in the family business (Donahoe 1999). Nam (1991) found that in households where the male head was self-employed in the tertiary sector, or was employed as a family worker, or was unemployed, married women were two to three times more likely to participate in the labour market than those in families with a higher social status, controlling for age, number of children under the age of six, and marital status. Women whose household heads were blue-collar wage workers did not show high female labour force participation (Nam 1991). In our analysis, the primary occupation of the head of the household, whether agricultural or non-agricultural, was considered a determinant of female work participation. The dummy variable (OCCUPATION_HEAD) took a value of 1 if the primary occupation was agriculture and 0 if it was non-agriculture. For Model I, the occupation of the head of the household is significant in explaining the work participation of the respondents, with the odds of a respondent participating in the workforce increasing by a factor of 2.566 if the occupation of the household head is agriculture. This implies that the odds of being in the workforce for women in agricultural households increases by almost three times, as against women in non-agricultural households. These results highlight the significant role played by women in agricultural activities. For Model II, the variable OCCUPATION_HEAD, although negative, does not have a significant effect on women's work participation.

Male migration has been significant in rural areas, particularly in the hill and mountain areas, from where men have moved to lowland areas in search of better employment opportunities. This increases the drudgery and work burden of women in these regions as they have to take on tasks previously performed by men (Pande 1996). A study of labour out-migration of rice-farming households in three districts of eastern Uttar Pradesh also reports an increase in the workload of women in nuclear households in the absence of males. The study shows that women took over many male-specific activities in rice farming (Paris *et al.* 2005).

The impact of male migration on the labour market behaviour of women, however, is ambiguous. A theoretical model developed by Lokshin and Glinskaya (2009) predicts that male migration could have two effects on female labour market participation. First, the increase in household income from remittances could lead to a reduction in labour market participation of women. Secondly, depending on the properties of the home production function, male migration could increase or decrease women's productivity at home, thus rendering their effect on labour market participation ambiguous. The overall effect of male migration on women's labour market participation therefore depends on the interaction of these factors.

To understand the effect of male migration on female work participation, the presence of a male migrant (MIGRANT) has been included in the present model as a dummy variable, with respondents in households with at least one male migrant being coded as 1 and households with no male migrants as 0. Though the presence of male migrants affects female work participation inversely in both models, it is not significant. The non-significant effect of MIGRANT in Model I is plausible, where both paid and unpaid activities of females have been considered. Irrespective of the presence of a male migrant, women in rural households participate in paid as well as unpaid activities. In Model II, women in households with at least one male migrant are less likely to participate in paid activities as household income may increase as a result of remittances (Lokshin and Glinskaya 2009). Women may also be forced to stay at home to perform household chores that were earlier performed by men, thus increasing their participation in unpaid domestic activities and leaving less time for participation in paid activities. This is contrary to the belief that male migration increases the participation of women in the workforce. The hypothesis that male out-migration increases the work participation of women can thus be rejected in the present study.

Family income has been noted as an important determinant of female work participation. Nayyar (1987) writes, "several scholars have pointed out that poverty is the single most important factor influencing female participation rates, which cuts across regions, religions, age, and time." Low levels of earnings among males induce females to participate in economic activities to supplement family income, a phenomenon referred to as the "additional worker effect" (Reddy 1979). Alternatively, the participation of women in the labour market leads to an increase in total family income, thereby postulating a positive relation between female labour force participation and total household income.

To avoid endogeneity in the present study, household income was approximated by using monthly per capita consumption expenditure (MPCE) as a proxy for family income. Estimated household expenditure is a better indicator of living standards than estimated income, particularly in household surveys in developing countries (Mailu *et al.* n. d.). The univariate analysis for household MPCE was statistically insignificant in both models. This implies that women in rural areas, irrespective of the level of expenditure or income, participate in economic activities, both paid and unpaid.

Land is not only a vital asset in agricultural families, but also an indicator of socio-economic status. Some micro studies have established a negative correlation between landlessness and female participation rates in rural areas in India. Given that landlessness is an indicator of poverty in rural areas, it appears logical that women in the landless category participate more in economic activities to supplement family income than women with land (Nayyar 1987). Some studies, however, find a positive relationship between women's work participation and the size of landholding (Bhati and Singh 1987). In our study, we have measured the landholdings of households in acres. The results, according to the univariate analysis, indicate a non-significant relation between the size of landholding and female work participation (and were thus not included in the logistic regression exercise). Since the study considers paid as well as unpaid work, land does not appear statistically significant as women in families with small or large holdings may be employed as unpaid labour on the family farm. Low prevalence of agricultural labour, and fewer stringent class and caste distinctions in the hill areas (relative to the plains) may also help explain the non-significant effect of land

on women's paid and unpaid labour on family farms. In Model II, however, the size of land owned by the family is statistically significant in explaining women's work participation in paid activities. The odds of a respondent participating in paid employment decreased by a factor of 0.47 or 53 per cent for every one-acre increase in land owned by the household. This can be attributed to the fact that smaller landholdings mean lower income from agriculture, inducing women to search for paid employment outside the household, in agriculture or non-agriculture.

CONCLUSIONS

Our analysis shows that women's employment in the rural hill regions of West Bengal is characterised by a predominance of unpaid work as family labour in agriculture. While 71.9 per cent of working-age women in the study were employed in paid as well as unpaid employment, only 14.5 per cent reported active participation in paid employment. This highlights the crucial role that women in the rural hill economy play through their involvement in unpaid farm employment and allied work.

The findings of the study show that the age of women has a non-linear effect on their participation in economic activities (paid as well as unpaid work). However, age does not show a significant effect on women's work decisions, if we consider only paid work. This implies that younger women – on account of child-bearing and child-rearing activities, and other household work – and older women may not participate in economic activities as much as women in the middle of the age distribution.

The results of the study also indicate the significant positive effect of education on women's involvement in paid work. Women with higher levels of education preferred to take up jobs outside the agricultural sector, either in self-employment or wage employment. Self-employment in the region included petty trade, such as running a shop in the vicinity of the household, while wage employment included teaching, working as an ICDS helper, a mid-day meal cook or in a government office. Wage employment in agriculture was not common due to the prevalence of the labour exchange system of "parma."

The structure of the family was also an important determinant of women's labour market behaviour, with women in nuclear families participating more in the labour market than women in joint families. The presence of a single male breadwinner and the desire to augment family income in order to improve living standards contribute to higher work participation among women in nuclear families. This suggests a higher work burden for women in nuclear families where there is very little sharing of domestic responsibilities. The study also shows that the presence of children under the age of six in the household lowered women's participation in paid work. The marital status of women was insignificant in determining women's involvement in economic activities in both models, although women's marital status and women's work participation had an inverse relation in the two models.

The presence of a male migrant in the family and the per capita consumption level of the household, a proxy for household income, had no significant effect on the work participation of women in the study. This is in contrast to studies that report higher female participation because of male out-migration. Finally, size of landholding was found to influence women's participation in paid activities in the study area, with women in households with smaller landholdings showing a higher likelihood of participating in paid activities.

Since women in the rural hill region make significant contributions to family farms as unpaid labour, it is important to recognise their contributions through a proper valuation of their services. Recognising women as farmers, and increasing their skills through training and education, along with provision of extension services, would help improve the position of women involved in farm activities. Diversification towards non-traditional agricultural activities such as horticulture, apiculture, and pisciculture would also help augment family income and improve rural well-being. Further, new jobs in the non-farm sector can increase the participation of women in paid work. Opportunities for self-employment in various farm and non-farm activities can also be explored, such as processing dairy products, pickling, production of jams and juices, handicrafts, and eco-tourism. The limiting effect of fertility on women's paid employment can be offset through the provision of child-care facilities at work.

NOTES

1 At present (that is, since March 30, 2017) Darjeeling district has four sub-divisions: Darjeeling Sadar, Kurseong, Mirik – which was carved out of Kurseong sub-division on March 30, 2017 – and Siliguri. Kalimpong became a separate district on February 14, 2017.▲

2 "Parma" is a system of direct labour exchange between two households in which the members of the households work on each other's land on alternate days (Subba 1985, p. 35).▲

3 This is not a matter for concern as the p -value of the squared term is not affected by multicollinearity. High correlation can be reduced by centering the variables (i.e. by subtracting the means) before squaring, which will have no effect on the p -value of the squared term or results for other variables including R-squared, but not the lower order terms. This means that multicollinearity is not a problem (Allison 2012).▲

4 The R^2 of a linear regression model and the pseudo R^2 of a choice model show a direct empirical relationship (Domencich and McFadden 1975), with pseudo R^2 values between the range 0.3 and 0.4 being translated as an R^2 between 0.6 and 0.8 for the linear model equivalent (Hensher *et al.* 2005, pp. 338–9).▲

5 The pseudo R^2 as shown by Nagelkerke R-square is 0.476 and 0.318 for Model I and Model II, respectively, and the model fit is quite satisfactory for both models.▲

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APPENDIX

Model Specification

Given the dichotomous nature of the response variable, binary logistic regression has been used in the present analysis. The dependent variable (Y) is female work participation, which can take only two values: $Y_i = 1$ if the respondent is in the workforce, and $Y_i = 0$ if the respondent is not in the workforce. The predictor variables X_i s, also known as covariates, may be numerical or categorical in nature. For a categorical variable, a dummy variable is used. If P_i represents the probability of the i^{th} female respondent being in the workforce, the model may be written as:

$$\text{Probability [a female is in the workforce]} = \text{Pr}(Y = 1) = \frac{1}{1 + e^{-Z}} = \frac{e^Z}{1 + e^Z} \quad (1)$$

where Z is a linear function of the explanatory variables. If X_1, X_2, \dots, X_k represent the various explanatory variables, then "Z" equation would be:

$$Z_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_k X_k$$

$X_i = i^{\text{th}}$ Explanatory variables ($i = 1, 2, \dots, k$) and

$\beta_i =$ parameters of the model ($i = 0, 1, 2, \dots, k$)

In the above equation P_i is non-linear not only in X_i s, but also in β s. It can be linearised in the following manner:

$$\text{Probability [a female is not in the workforce]} = 1 - \text{Pr}(Y = 1)$$

$$= 1 - \frac{1}{1 + e^Z} = \frac{1}{1 + e^Z} \quad (2)$$

$$\text{We can write } \frac{P_i}{1 - P_i} = \frac{1 + e^Z}{1 + e^Z} = e^Z \quad (3)$$

Here $\frac{P_i}{1 - P_i}$ are the odds in favour of a female participating in the workforce, which is the ratio of the probability of an event occurring to the probability of the event not occurring. Taking the natural logarithm of the odds, we get

$$L_i(\text{logit}) = \ln\left(\frac{P_i}{1 - P_i}\right) = Z \quad (4)$$

$$L_i = \ln\left(\frac{P_i}{1 - P_i}\right) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_k X_k \quad (5)$$

Now, L_i , the log of the odds, is linear not only in X_i s but also in the β s, and is termed the logit (Gujarati 2004, pp. 595–96). As the value of P_i varies from 0 to 1, the odds vary from 0 to ∞ . When $P_i = 0.5$, the odds are 1. On the odds scale, the values from 0 to 1 correspond to values of P_i from 0 to 0.5. On the other hand, values of P_i from 0.5 to 1 result in odds of 1 to ∞ . Taking the natural logarithm of the odds cures this asymmetry. When $P_i = 0$, $\ln(\text{odds}) = -\infty$; when $P_i = 0.5$, $\ln(\text{odds}) = 0.0$; and when $P_i = 1$, $\ln(\text{odds}) = +\infty$ (Arifi et al. 2012, p. 272). This implies that although the probabilities lie between 0 and 1, the logit is not bounded and can lie between $-\infty$ and $+\infty$, and as such can have an unlimited range of values. The link function (the function of the dependent variable that yields a linear function of the independent variables) in the logistic regression model is therefore the logit transformation (Hosmer and Lemeshow 2002, p. 48).

For easier interpretation, the log odds can be converted into an odds ratio, or the ratio of the odds of occurrence of an event between two situations. If we consider two values of the categorical independent variable X, where X=0 and X=1, the odds ratio for Y=1 may be written as:

$$\text{Odds ratio} = \frac{P_{1/1} - P_1}{P_{0/1} - P_0}$$

where P_1 is the probability of Y=1 for X=1, and P_0 is the probability of occurrence of Y=1 for X=0. The numerator therefore represents the odds in favour of the event Y for X=1, and the denominator represents the odds in favour of Y for X=0 (*ibid.*, pp. 48–50).

Multicollinearity in the Model

The rule of thumb is that if the pair-wise or zero-order correlation coefficient between two regressors is high, for example, in excess of 0.8, multicollinearity is a serious problem (Gujarati 2004, p. 359). Eigen values and condition indices may also be used on occasion to detect the presence of multicollinearity.

Appendix Table 1 Correlation matrix of explanatory variables

	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}
X_1	1									
X_2	0.068	1								
X_3	0.177	0.051	1							
X_4	-0.010	-0.068	0.108	1						
X_5	0.074	-0.054	-0.078	-0.034	1					
X_6	-0.065	0.076	0.113	0.033	-0.145	1				
X_7	0.173	0.024	0.008	-0.025	-0.070	-0.062	1			
X_8	-0.430	0.028	-0.344	0.176	0.047	-0.031	0.053	1		
X_9	-0.213	0.210	-0.029	-0.179	-0.143	0.113	0.038	0.283	1	
X_{10}	0.136	0.167	-0.130	-0.046	0.266	0.011	0.138	-0.013	-0.024	1

Note: X_1 -EDUCATION, X_2 -FAM_STR, X_3 -CHILD_06, X_4 -MARITAL_STATUS, X_5 -OCCUPATION_HEAD, X_6 -MIGRANT, X_7 -MPCE, X_8 -AGE, X_9 -AGE_SQU, X_{10} -LAND

In the present analysis, the pair-wise correlation coefficients between the regressors exhibit values less than the cut-off value of 0.8 (Appendix Table 1). Further, for both models, the values of tolerance, VIF, Eigen value, and condition indices are well within the cut-off range to rule out multicollinearity among the predictors (Appendix Tables 2 and 3).

Appendix Table 2 Tolerance, variance inflation factor (VIF), and collinearity diagnostics for Model I

Variables	Tolerance	VIF	Dimension	Eigen value	Condition index
EDUCATION	0.780	1.282	1	4.606	1.000
FAMILY_STR	0.935	1.070	2	1.366	1.836
CHILD_06	0.828	1.207	3	0.848	2.330
MARITAL_STATUS	0.862	1.161	4	0.624	2.718
OCCUPATION_HEAD	0.941	1.062	5	0.553	2.887
MIGRANT	0.949	1.054	6	0.384	3.462
AGE	0.629	1.589	7	0.355	3.708
AGE_SQU	0.784	1.275	8	0.215	4.632
Mean of VIFs		1.213	9	0.069	8.169

Appendix Table 3 Tolerance, variance inflation factor (VIF), and collinearity diagnostics for Model II

Variables	Tolerance	VIF	Dimension	Eigen value	Condition index
EDUCATION	0.769	1.300	1	5.215	1.000
FAMILY_STR	0.904	1.106	2	1.372	1.950
CHILD_06	0.809	1.236	3	0.894	2.416
MARITAL_STATUS	0.862	1.161	4	0.652	2.829
OCCUPATION_HEAD	0.875	1.143	5	0.557	3.061
MIGRANT	0.945	1.058	6	0.385	3.678
AGE	0.629	1.590	7	0.356	3.828
AGE_SQU	0.784	1.275	8	0.287	4.262
LAND	0.861	1.161	9	0.215	4.929
Mean of VIFs		1.226	10	0.068	8.737

Selection of Variables

Prior to inclusion of a variable in the logistic model, we carried out a univariate analysis of each variable (Appendix Tables 4 and 5). Any variable whose univariate test has a p -value < 0.25 is a candidate for the multivariable model (Hosmer and Lemeshow 2002).

Appendix Table 4 Univariate analysis for Model I (dependent variable - FLFP)

FLFP		B	S. E.	Wald	df	Sig.	Exp(B)
Step 1a	AGE	0.106	0.018	33.071	1.000	0.000	1.112
Step 1a	AGE_SQU	-0.004	0.001	16.703	1.000	0.000	0.996
Step 1a	EDUCATION	-0.080	0.032	6.183	1.000	0.013	0.923
Step 1a	FAM_STR (1)	-0.845	0.306	7.633	1.000	0.006	0.430
Step 1a	CHILD_06 (1)	-1.221	0.369	10.959	1.000	0.001	0.295
Step 1a	MARITAL_STATUS (1)	1.062	0.321	10.964	1.000	0.001	2.894
Step 1a	OCCUPATION_HEAD (1)	0.965	0.299	10.411	1.000	0.001	2.624
Step 1a	MIGRANT (1)	-0.660	0.334	3.920	1.000	0.048	0.517
Step 1a	MPCE	0.034	0.081	0.175	1.000	0.676	1.034
Step 1a	LAND	-0.025	0.080	0.099	1.000	0.754	0.975

Note: a. Variable(s) entered for step 1: AGE / AGE_SQU / EDUCATION / FAM_STR / CHILD_06 / MARITAL_STATUS / OCCUPATION_HEAD / MIGRANT / MPCE / LAND.

Thus, MPCE and LAND have been excluded as explanatory variables for Model I. For Model II, AGE and MPCE have p values < 0.25. However, as AGE_SQU is statistically significant, both AGE and AGE_SQU have been included as explanatory variables but MPCE has been excluded.

Appendix Table 5 Univariate analysis for Model II (dependent variable - FLFP_PAID)

FLFP_PAID		B	S. E.	Wald	df	Sig.	Exp(B)
Step 1a	AGE	-0.008	0.017	0.238	1.000	0.625	0.992
Step 1a	AGE_SQU	-0.004	0.002	4.196	1.000	0.041	0.996
Step 1a	EDUCATION	0.084	0.038	5.056	1.000	0.025	1.088
Step 1a	FAM_STR(1)	-1.186	0.403	8.686	1.000	0.003	0.305
Step 1a	CHILD_06(1)	-1.974	1.032	3.662	1.000	0.056	0.139
Step 1a	MARITAL_STATUS (1)	-0.477	0.403	1.401	1.000	0.237	0.621
Step 1a	OCCUPATION_HEAD (1)	-0.507	0.374	1.839	1.000	0.175	0.602
Step 1a	MIGRANT(1)	-1.176	0.627	3.520	1.000	0.061	0.308
Step 1a	MPCE	0.014	0.100	0.020	1.000	0.888	1.014
Step 1a	LAND	-0.649	0.246	6.962	1.000	0.008	0.523

Note: a. Variable(s) entered on step 1: AGE / EDUCATION / FAM_STR / CHILD_06 / MARITAL_STATUS / OCCUPATION_HEAD / MIGRANT / MPCE / LAND

Summary Statistics

Appendix Table 6 shows the mean and standard deviation of the explanatory variables used in the two models. The average age of women in the labour force in Model I (40.9) is higher than that in Model II (37.2). The level of education as measured by years of schooling for women who are in the workforce is higher for Model II (8.7) than for Model I (6.11). The average size of landholding of women in the workforce in Model II is lower than that in Model I, whereas the average monthly per capita consumption expenditure of women who are in the workforce is almost equal in the two models. The average monthly per capita consumption expenditure for women who are in the workforce for Model I is Rs 2,867.81 and Rs 2,877.35 for Model II; and the average size of landholding is 1.97 acres for Model I and 1.26 acres for Model II. For the categorical explanatory variables, for example, a mean of 0.48 for FAMILY_STR for FLFP = 1 implies that 48 per cent of women in the workforce in Model I are in joint families.

Appendix Table 6 Summary statistics of the explanatory variables

Explanatory variables	Model I				Model II			
	FLFP = 1 N = 169		FLFP = 0 N = 66		FLFP_PAID = 1 N = 34		FLFP_PAID = 0 N = 201	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
AGE	40.97	9.38	30.94	11.98	37.29	8.59	38.3	11.5
EDUCATION	6.11	5.19	8.08	4.39	8.71	7.91	6.32	4.31
FAMILY_STR	0.48	0.5	0.68	0.47	0.29	0.46	0.58	0.5
CHILD_06	0.11	0.31	0.29	0.46	0.03	0.17	0.18	0.38
MARITAL_STATUS	0.82	0.39	0.61	0.49	0.68	0.48	0.77	0.42
OCCUPATION_HEAD	0.62	0.49	0.38	0.49	0.44	0.5	0.57	0.5
MIGRANT	0.18	0.39	0.3	0.46	0.09	0.29	0.24	0.43
MPCE	2.87	1.72	2.76	2.11	2.88	1.56	2.83	1.88
LAND	1.97	1.73	9.34	1.92	1.26	0.87	2.12	1.87
Sample size	235				235			

Likelihood Ratio Test

The likelihood ratio (LR) statistic, or Omnibus Test of Model Coefficients, using SPSS version 23, is shown in Appendix Table 7. For both models, the chi-square was significant, indicating that at least one of the predictors is significantly related to the outcome variable. Since all variables have been entered at the same time, there is no difference between step, block or model chi-square values.

Appendix Table 7 Omnibus tests of model coefficients – Model I and Model II

Model I Dependent variable = FLFP				Model II Dependent variable = FLFP_PAID				
		Chi-square	df	Sig.		Chi-square	df	Sig.
Step 1	Step	94.443*	8	0.000	Step 1	46.268#	9	0.000
	Block	94.443	8	0.000	Block	46.268	9	0.000
	Model	94.443	8	0.000	Model	46.268	9	0.000

Notes: * Initial -2 Log Likelihood = 279.065, Model -2 Log Likelihood = 184.622, hence LR statistic = 279.065 - 184.622 = 94.443
Initial -2 Log Likelihood = 194.284, Model -2 Log Likelihood = 148.016, hence LR statistic = 194.284 - 148.016 = 46.268.

Hosmer and Lemeshow Goodness of Fit

The Hosmer–Lemeshow (H–L) statistic (Appendix Table 8) for both models yields a desirable outcome of non-significance ($p = 0.636$ for Model I and $p = 0.557$ for Model II), indicating that the predicted model does not significantly differ from the observed model.

Appendix Table 8 Hosmer and Lemeshow goodness of fit test

Model I Dependent Variable – FLFP				Model II Dependent Variable – FLFP_PAID			
Step	Chi-square	df	Sig.	Step	Chi-square	df	Sig.
1	6.101	8	0.636	1	6.812	8	0.557

 R^2 Equivalents for Logistic Regression/Pseudo R-square

In SPSS, the two most commonly used measures of Pseudo R-square are Cox and Snell R-square and Nagelkerke R-square. Another measure, reported by EViews, is the McFadden R-square. Values of the Pseudo R-square for both models are shown in Appendix Table 9.^{4, 5}

Appendix Table 9 Values of pseudo R^2

	Model I (Dependent variable – FLFP)	Model II (Dependent variable – FLFP_PAID)
McFadden R-square	0.338	0.238
Cox and Snell R-square	0.331	0.179
Nagelkerke R-square	0.476	0.318

Notes: (i) Estimation terminated at iteration number 5 because parameter estimates changed by less than 0.001.
(ii) Estimation terminated at iteration number 6 because parameter estimates changed by less than 0.001.

Classification Table

The classification table for Model I (Appendix Table 10) shows that the model correctly predicts 81.3 per cent of observations as compared to the constant only model. Sensitivity, defined as the proportion of observations with $Y = 1$ that are correctly predicted by the model, is 91.7 per cent, and specificity, defined as the proportion of observations with $Y = 0$ that are correctly predicted by the model, is 54.5 per cent. The estimated equation is 9.4 per cent better at predicting responses than the constant only model.

Appendix Table 10 Classification table – Model I

Observed		Predicted			Observed	Predicted		
		FLFP		Percentage correct		FLFP		Percentage correct
		0	1			0	1	
Step 0 a b	FLFP	0	0	66	0	36	30	54.5
		1	0	169	100	14	155	91.7
	Overall Percentage							81.3

Notes: (i) Constant is included in the model.
(ii) The cut-off value is 0.500.

The classification table for Model II (Appendix Table 11) shows that the model correctly predicts 88.1 per cent of observations as compared to the constant only model. Sensitivity is 20.6 and specificity is 99.5 per cent. The estimated equation is 2.6 per cent better at predicting responses than the constant only model.

Appendix Table 11 Classification table for Model II

Observed		Predicted			Observed	Predicted		
		FLFP_PAID		Percentage correct		FLFP_PAID		Percentage correct
		0	1			0	1	
Step 0 a b	FLFP_PAID	0	201	0	100	200	1	99.5
		1	34	0	0	27	7	20.6
	Overall Percentage							88.1

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Notes: (i) Constant is included in the model.
(ii) The cut-off value is 0.500.

The full model, including all predictor variables, was tested against the constant only model and found to be statistically significant (Chi-square = 94.443 for Model I at $p = 0.000$ at 8 degrees of freedom, and Chi-square = 46.268 for Model II at $p = 0.000$ at 9 degrees of freedom as shown in Appendix Table 7). The Pseudo R-square values (Cox and Snell R-square = 0.331, Nagelkerke R-square = 0.476, and McFadden R-square = 0.338) for Model I show that 33 to 48 per cent of the variations in female work participation are explained by the set of predictor variables. The Pseudo R-square values for Model II are Cox and Snell R-square = 0.179, Nagelkerke R-square = 0.318, and McFadden R-square = 0.238. The percentage of correct predictions by the model is 81.3 per cent for Model I and 88.1 per cent for Model II.

