

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).

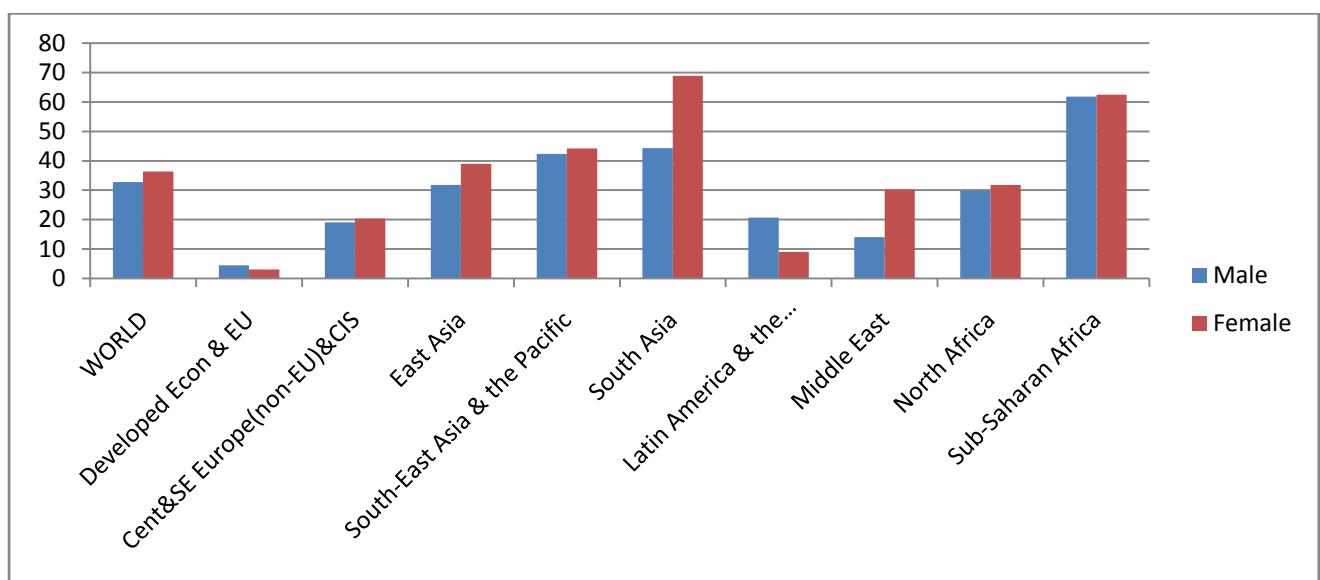
In many rural areas, the out migration of men and other changes in the farming system due to global climate change or government regulations have led to an increase in rural women's burdens. In hill and mountain regions which are characterised by a high level of male out migration, women's role in maintaining 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 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 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. $E(u_i^2) = \sigma^2$ 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	OCCUPATIO N_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_ST R	Dummy Variable =1 Joint = 0 Unitary
Male Time in Agriculture	TIME_MALE S	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

X_1 -AGE, X_2 -AGE_SQU, X_3 -EDUCATION, X_4 -FAMILY_STR, X_5 -MARITAL_STATUS, X_6 -OCCUPATION_HEAD, X_7 -MIGRANT, X_8 -MPCE, X_9 -LAND, X_{10} -TIME_MALES, X_{11} - 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	Samalbong (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	Samalbong (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	Samalbong (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 contended 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.

Chapter References

- Achampong, S. B., Mensah, J. O., Aidoo, R. and Agyemang, K. O. (2012). The role of rural women in the attainment of household food security in Ghana: A case study of women-farmers in Ejura-Sekyeredumasi district. *International Journal of Pure and Applied Sciences and Technology*, 12 (1), 29-38.
- Asian Development Bank (ADB). (2013). *Gender equality and food security: Women's empowerment as a tool against hunger*. Philippines: Asian Development Bank.
- Agarwal, B. (1994). *A field of one's own: Gender and land rights in South Asia*. Cambridge: Cambridge University Press.
- Bhati, J.P. and Singh, D.V. (1987). Women's contribution to agricultural economy in hill regions of north-west India. *Economic and Political Weekly*, 22 (17), WS7-WS11.
- Census of India. (2011). *Census of India, 2011*. Retrieved from <http://www.censusindia.gov.in> viewed on 12 October, 2017.
- Chowdhry, P. (1993). High participation, low evaluation: Women and work in rural Haryana. *Economic and Political Weekly* 28 (52), A135-A137+A140-A148.
- Cornhiel, S. L. (2006). *Feminization of agriculture: Trends and driving forces*. Background Paper for the World Development Report, 2008. Retrieved from http://siteresources.worldbank.org/INTWDRS/Resources/477365-1327599046334/8394679-1327599874257/LastarriaCornhiel_FeminizationOfAgri.pdf
- Dixon, R. B. (1982). Mobilizing women for rural employment in South Asia: Issues of class, caste, and patronage. *Economic Development and Cultural Change*, 30 (2), 373-390.
- Dutt, R. and Sundaram K.P.M. (2009). *Indian Economy*. New Delhi: S. Chand & Company Ltd.
- Food and Agriculture Organisation (FAO). (2011) *State of food and agriculture: Women in agriculture: Closing the gender gap for development*. Rome, Italy: FAO.
- Gamisonia, N. (2017, 20-22nd September). Challenges and opportunities for equal participation of women and girls in rural development in Georgia. UN Women, IFAD, FAO, WFP Expert Group Meeting. *Challenges and opportunities in achieving gender equality and the empowerment of rural women and girls*. Retrieved from <http://www.peacewomen.org/sites/default/files/EP2%20Nino%20Gamisonia.pdf>

- Greene, W. H. (2002). *Econometric analysis* (Fifth Edition). Upper Saddle River, New Jersey: Prentice Hall.
- Gujarati, D. (2004). *Basic econometrics* (Fourth Edition). New York: The McGraw-Hill Companies.
- Ibrahim, H. I. and Ibrahim, H.Y. (2012): Access of rural women to productive resources in a rural area of northern Nigeria. *Elixir Soc. Sci.* 44, 7088-7092.
- Ibnouf, F. O. (2009). The role of women in providing and improving household food security in Sudan: Implications for reducing hunger and malnutrition. *Journal of International Women's Studies*, 10 (4), 144-167.
- International Labour Organisation (ILO). (2012). *Global employment trends for women*. Geneva: International Labour Office.
- Kafle, R. B. (2015). Covariates of currently married women's employment in Nepal: A regional analysis. *Journal of Management and Development Studies*, Vol. 26, 62-78.
- Kelkar, G. (2005). Development effectiveness through gender mainstreaming: Gender equality and poverty reduction in South Asia. *Economic and Political Weekly*, 40 (44-45), 4690-4699.
- ----- (2011). Gender and productive assets: Implications for women's economic security and productivity. *Economic and Political Weekly*, 46 (23), 59-68.
- Krishnaraj, M. and Kanchi, A. (2008). *Women farmers of India*. New Delhi: National Book Trust.
- Lokshin, M. and Glinskaya, E. (2009). The effect of male migration on employment patterns of women in Nepal. *The World Bank Economic Review*, 23 (3), 481–507.
- Makepe, P. M. and Oageng, P. T. (2012). Determinants of female labour force participation in agricultural sector in Botswana. *Asian-African Journal of Economics and Econometrics*, 12 (2), 449-461.
- Maki, O. (1993). Gender and the labour market. *The Journal of Japanese Studies*, 19 (1), 79-102.
- Midi, H., Sarkar, S. K., and Rana, S. (2010). Collinearity diagnostics of binary logistic regression model. *Journal of Interdisciplinary Mathematics*, 13 (3), 253–67.
- Moksony, F. (1990). Small is beautiful: The use and interpretation of R^2 in social research. *Szociologiai Szemle*, Special Issue, 130-138.

- Moktan, M. W. and Mukhopadhey, S.D. (2012). Nature and extent of participation of farm women and their economic contribution in agriculture: A case study in hilly district of West Bengal. *Indian Res. J. Ext. Edu*, 12(2), 1-9.
- Mtsor, Y. G. and Idisi, P. D. (2014). Gender inequality and women participation in agricultural development in Nigeria. *Merit Research Journal of Education and Review* 2(11), 296-301.
- Nayyar, R. (1987). Female participation rates in rural India. *Economic and Political Weekly*, 22 (51), 2207-2209+2211-2216.
- Nichols, S. E., Ng'ang'a, S., Komjathy, K. and Ericsson, A. (2001, October 2-5). *Measuring and protecting access to land: Development of the FIG guidelines on gender inclusion in land administration*. International Conference on Spatial Information for Sustainable Development Nairobi, Kenya. Retrieved from <https://www.fig.net/resources/proceedings/2001/nairobi/nichols-nganga-komjathy-ericsson-TS7-3.pdf>
- Pande, P. N. (1996). *Drudgery of the hill women*. New Delhi: Indus Publishing Company.
- Parveen, S. (2008). Access of rural women to productive resources in Bangladesh: A pillar for promoting their empowerment. *International Journal of Rural Studies*, 15 (1), 1-8.
- Paul, P. and Meena, B.S. (2016). A Study on access to and control over resources: Gender perspective. *International Journal of Science, Environment and Technology*, 5 (5), 2982 – 2988.
- Quisumbing, R., Brown, L. R., Feldstein, H. S., Haddad, L. and Pena, C. (1995). *Women: The key to food security*. Food Policy Report. Washington DC: The International Food Policy Research Institute.
- Radel, C. and Coppock, D. L. (2013). The world's gender gap in agriculture and natural resources: Evidence and explanations. *Rangelands*, 35 (6), Women as Change Agents in the World's Rangelands, 7-14.
- Rao, N. (2005). Women's rights to land and assets: Experience of mainstreaming gender in development projects. *Economic and Political Weekly*, 40 (44/45), 4701-4708.
- ----- (2011). Gender, land and resource rights in India. In *Du grain à moudre. Genre, développement rural et alimentation*. (Dir.) C. Verschuur, 209-245.

- Rekha, K. H. (2012). *Women in dry land and irrigated agriculture: A case study of Davangere district*. (Doctoral thesis, Kuvempu University, Jnana Sahyadri, Shankaraghatta). Retrieved from <http://hdl.handle.net/10603/85287>
- Rustagi, P. and Menon, R. (2011). *Gender asset gaps and land rights in the context of the Asia-Pacific region*. Working paper WP 02/2011. New Delhi: Institute for Human Development.
- Sachs, C. E. (1996). *Gendered fields: Rural women, agriculture, and environment*. Boulder, CO: Westview Press, Inc.
- Singh, S., Kushwah S., Singh, V. B. and Daipuria, O.P. (2015). Factor affecting the participation of rural women in agricultural activities. *Indian Res. J. Ext. Edu.*, 15(1), 81-83.
- Srivastava, N. and Srivastava, R. (2010). Women, work, and employment outcomes in rural India. *Economic and Political Weekly*, XLV (28), 49-63.
- Swedish International Development Cooperation Agency (Sida). (2015). *Women and food security*. Gender ToolBox Brief. Retrieved from <https://www.sida.se/contentassets/bc3dc44b16c44725868e57125b9542e3/women-and-food-security.pdf> Viewed on 01/07/2017.
- Thakur, D. (1991). Farm female worker employment in Himachal Pradesh. In R. K. Punia (Ed.), *Women in agriculture Vol.1: Their status and role*. (pp. 55-69). New Delhi: Northern Book Centre.
- Verma, S. K. (1992). *Women in agriculture: A socio-economic analysis*. New Delhi: Concept Publishing Company.
- Wooldridge, J. M. (2013). *Introductory econometrics: A modern approach* (5th Edition). USA, South-Western: Cengage Learning.
- World Bank. (2007). *World development report 2008: Agriculture for development*. Washington DC: The World Bank.