# DETERMINANTS OF FEMALE LABOUR FORCE PARTICIPATION IN FARM AND NON-FARM LIVELIHOOD ENTERPRISES: THE CASE OF FEMALE LABOUR PARTICIPATION IN NORTHERN GHANA

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## Abstract

The purpose of this paper is to examine determinants of female labour participation in on-farm, and non-farm livelihood enterprises among women in north of Ghana. Data were obtained from a Population baseline survey conducted by METSS as part of USAID 'Feed The Future Programme' in Northern Ghana Zone in 2012. The survey covered 4,410 households with over 24,000 persons. Individuals covered in this survey who were 15 years or older were 13, 580 and they constitute the sample for this paper. The data were analysed by the use of Chi-square and probit regression analysis. The results of the Chi-square analysis established significant gender disparities in labour participation in food and cash crop production, livestock production, non-farm self-employed enterprises and paid wage labour at 1% level of significance. Also the probit regression analysis identified the location of respondents as either rural or urban, household status, marital status, literacy, participation in household decision making on use of productive resources, income and control over household resources as significant in determining female labour participation in both on-farm and non-farm self-employed enterprises as well as wage labour. The paper recommends empowerment of females through enhancing their access to formal education, improving their access to household decision making on use of household income and control over productive resource to facilitate their participation in both on-farm and non-farm enterprises as well as wage labour.

**Key Words:** Participation, Female labour, on-farm, non-farm, self-employed, household decision and resource access

**1.0 INTRODUCTION**

Notwithstanding the fact that women make up a little over half the world's population and constitute the greater proportion of the global labour force, their contribution to measured economic activity, growth, and well-being is far below its potential (Elborgh-Woytek *et al,* 2013). International Monetary Fund (IMF) (2013) on 'Women, Work, and the Economy', argued that in spite of significant progress in recent decades, labour markets across the world remains divided along gender, a situation which continues to inhibit the progress toward achieving gender equality. Gender has been noted as a key determinant of access to productive resources and provides basis for the division of labour within the household, the social values attributed to different types of work, and bargaining power, making it a key determinant of decent work outcomes (IFAD, 2000). The IFAD Rural Poverty Report 2001 also noted that, access to labour markets is important for improving the well-being of the poor, especially women. Female Labour Participation (FLP) has remained lower than male participation (Elborgh-Woytek *et al,* 2013. Women are usually engaged in most unpaid work, and when they are employed in paid work, they tend to be overrepresented in the informal sector (Blackden and Hallward-Driemeier 2013; Elborgah-Woytek *et al,* 2013). Gender gap in labour force participation in paid work is attributable to women's lack of access to productive resources, education and training (Sackey, 2005). This results in gender differentials productivity (Do et al., 2011), which tends to hinder progress towards economic empowerment of women and gender equity in development. A reduction of this productivity gap through equal access to productive resources could yield considerable gains for rural development as well as national economies (World Bank, 2011)

Female Labour Participation Rate (FLPR) over the past two decades has hovered around 50 percent (World Bank, 2011). Elborgah-Woytek *et al. (*2013) observed significant cross-regional differences in levels and trends of FLPRs. The study observed that FLPRs vary from as low as 21 percent in the Middle East and North Africa to over 63 percent in East Asia and the Pacific and sub-Saharan Africa. Available literature indicates that FLPRs do not only vary across regions and countries but also among rural-urban population within countries. IFAD 2011 Rural Poverty Report observed gender disparities in labour participation rates in rural on-farm and non-farm activities, as a common phenomenon in most developing countries. Also, according to Food and Agricultural Organization (FAO) (2012) report on 'gender inequalities in rural employment in Ghana', the majority of rural Ghanaians are self-employed in agriculture and 56 percent of the rural working population has more than one source of income. It further observed that overall, very few rural Ghanaians engage in paid labour and when opportunities exist, women are at the disadvantage position. Thus, men take five times more in wage-employment than women.

Rural poor participating in labour markets is influenced by a number of factors. These factors apply to both men and women, but can have an even greater impact on women as observed by rural poverty report of 2011 and IFAD (2010). Some of these factors include poor road networks in most rural areas, poor or lack of access to education and skill training, gender in balance labour markets as a result of gender division of labour, social norms and restriction that limit rural women's access to and control over productive resources such as land and other economic resources.

Notwithstanding the improvement in the growth of Ghana's economy over the last decade ( see ISSER, 2010; NDPC, 2010; Ghana Budget Statement, 2012; ISSER, 2013,), labour unemployment continue to be a major development challenge for Ghana (Otoo *et al*, 2009;

Asante, 2011; Business Guide, 2011; Owusu-Ansah *et al,* 2012 and Mensah, 2012). Also Ghana's progress in poverty reduction, appeared not to have a significant impact on poverty levels of rural men and women in the country because an important share of rural men and women still lack decent work opportunities (FAO, 2012). This situation is coupled with the fact that agriculture which the mainstay of rural economy in Ghana continue to experience declining growth rate, moving from 7.4% in 2008 to 3.4% in 2013 (Government of Ghana Budget Statement, 2014) posing a challenge to poor rural people of being able to sustain their livelihoods. The Northern part of the country – poorest regions in Ghana are of major concern.

Although agricultural income continue to  constitute the backbone of the rural economy in most developing countries, incomes from wage labour and other non-farm income generating activities have increasingly become significant (Bright *et al.* 2000; Lanjouw and Shariff, 2002; IFAD, 2010; FAO, 2012). For several decades participation in labour markets has always been an important strategy for poverty alleviation and attainment of food security (Ruben Carletto and Krausova, 2007). In the context of the economy, the concept of labour force participation is important consideration, because increased labour force participation can influence economic indicators such as the unemployment rate, poverty, and overall standard of living particularly for the vulnerable and poor women in the rural society. As women constitute nearly half of the working age population and remain the poorest in most developing communities including Northern Ghana (World Development Report, 2012), it is important to look at women's participation in labour markets. Also, the World Development Report, 2012 observed that female labour force participation in the rural economy is crucial, because it is related to the issue of women's empowerment and gender equality.

Indeed despite the importance of labour force participation in Northern Ghana, most literature contributing to this discourse often concentrated on national level using macroeconomic aggregated data without much attention being paid to location specific, peculiarities and empirical data that can adequately explain socio-cultural factors such as gender and how it shapes individual participation in labour markets in Northern Ghana, particularly issues relating to gender (Bright *et al.*, 2000; Isgut 2003; Sackey 2005 and Ackah, 2009). Taking the analysis of labour market participation at the national and using aggregated data may have its own merits, but it may overlook the spatial interconnectedness of rural labour market which is crucial for rural policy targeting and formulation. As such, this paper relied on empirical population based line survey data to identifying factors determining female labour participation in on-farm, non-farm and wage labour livelihood enterprises in Northern Ghana. Information from this paper will help to guide policy formulation targeting poverty reduction and empowering women as envisaged in the Millennium Development Goals (MDGs).

## 2.0 MATERIALS AND METHODS

The paper used the data generated from USAID Feed the Future (FTF) Population baseline Survey conducted in Northern Ghana in 2012. The survey conducted by Monitory and Evaluation Technical Support Services (METSS) in partnership with the Institute of Statistical, Social and Economic Research (ISSER) of the University of Ghana as well as the Ghana Statistical Service in FTF Northern Zone of Influence. The survey was to generate data for FTF impact and outcome indicators, in their Zone of Influence (ZOI) within Northern Ghana (Maberry *et.al*, 2014). The survey covered 4,410 households with nearly 25,000 individuals in 45 districts across the four regions in the SADA Area of Northern Ghana.

From the over 24, 000 respondents from the 4,410 households surveyed, during the 2012 Feed the Future METSS Population based survey in Northern Ghana, 13, 580 of them were 15 years or older, the official working age of Ghana (NYC, 2012), and as such constitute the sample for this paper.

The Northern Ghana Zone of Influence (ZOI) of FTF programme falls within the Savannah Accelerated Development Authority (SADA) Area. The Northern Ghana Zone of Influence which encompasses the area above Ghana's 8th parallel consist of the whole of Northern, Upper West, and Upper East Regions, and Northern parts of Volta, and Brong/Ahafo Regions. Map of the areas covered by the USAID/FTF population based line survey is presented in Figure 1.
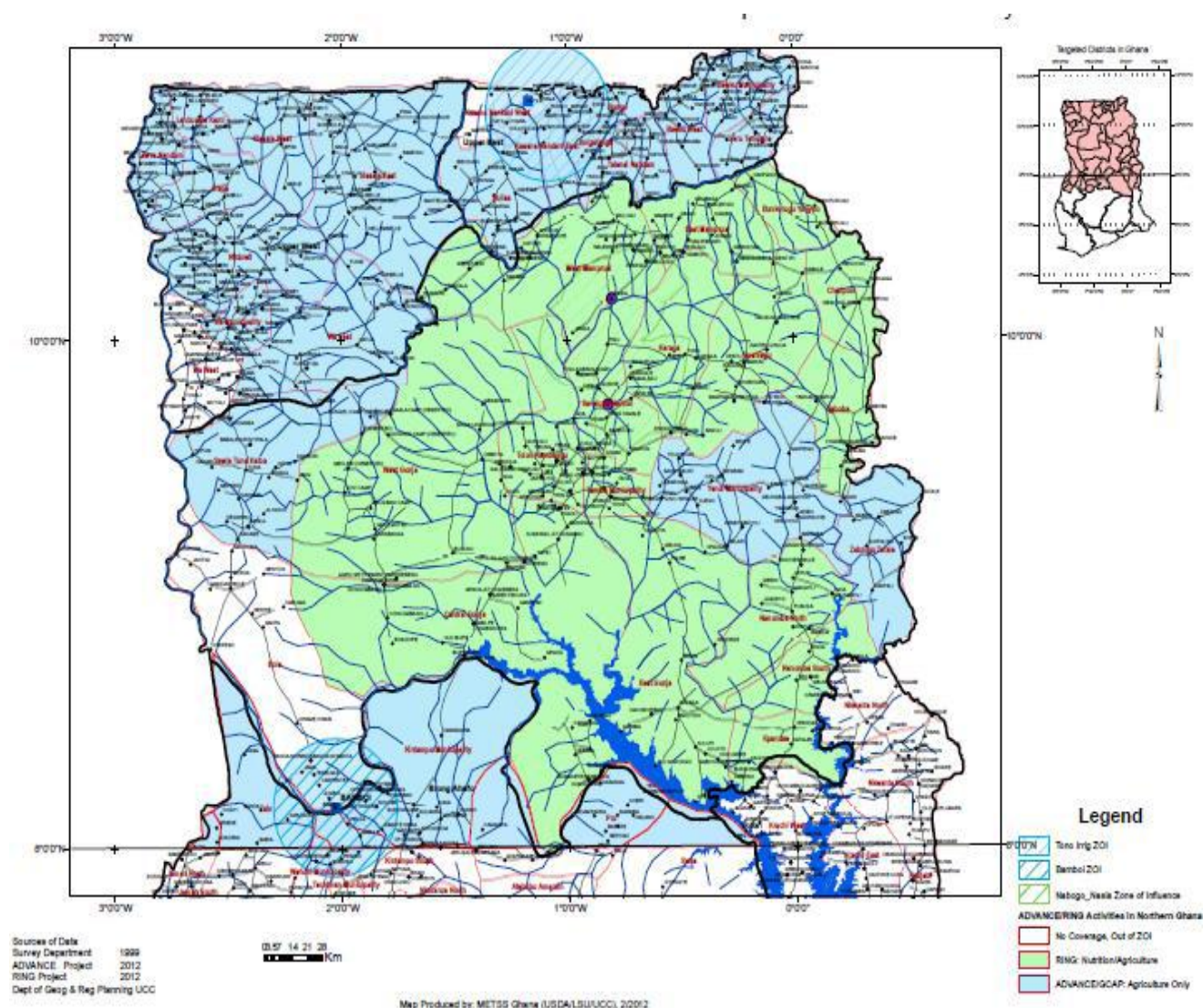


Source: METSS-GHANA, (2012)

Figure 1: Map of Northern Ghana, Depicting the Zone of Influence of FTF Intervention

**2.1 Methods of Data Analysis**

Chi-square analysis was used in analyzing gender dimension of labour force participation in various livelihood enterprises such as on-farm, non-farm self-employed enterprises and wage labour. This was used to test the hypothesis below:

$H_{o1}$:   there is no significant difference in Labour Participation (LP) between male and female in labour markets in northern Ghana.

The Chi-square formula below was applied.  Stata version 11 statistical software package was used to aid data entering and analysis.

$$\chi^2 = \frac{\sum(O\text{-}E)^2}{E}$$

Where O = Observed frequency and E = Expected frequency

Regression model was used to estimate the determinants of Female Labour Participation (FLP) in the various livelihood enterprises in Northern Ghana. The dependent variable was FLP which was expressed as a function of selected explanatory variables. The dependent variables was obtained from responses gathered on the question 'did you participate in named livelihood activities (food production, cash crop production, livestock production, non-farm and wage labour) within the last 12 months'. The binary response (yes/no) was analysed using binary choice model. As such dichotomy cumulative function as shown in the question 1 below was considered.

$Y_i = f(X_1, \ldots., Xn)$ ……………………………………….(1)

Where *Yi* denotes Female participation in a given livelihood (i = 1; if a female participate in a given livelihood activity and i = 0; if otherwise).

*Xl*, …., *Xn* represents various socioeconomic and demographic factors determining FLP in a given livelihood  activity. Two non-linear models, namely probit and logit are usually used to estimate the function specified in equation (1) (see Gujarati, 2004). This study employed probit model in estimating determinants of female labour participation. The independent variables selected in this probit regression model included age, marital status, literacy, household status and size, access to credit, access and control over household productive resources, household decision making and working hours per day

## 3.0 RESULTS AND DISCUSSIONS

From the over 24, 000 respondents in the 4,410 households surveyed, during the 2012 Feed the Future METSS Population baseline survey in Northern Ghana, 13, 580 of them were 15 years or older, the official working age of Ghana (NYC, 2012),  and as such constitute the sample for this paper. During the survey, respondents were asked whether they have participated in the various livelihood activities within the last 12 months. The livelihood activities available in Northern of Ghana included agricultural based such as food crop production, cash crop production, livestock rearing and fishery. Others are wage labour and Non-farm self-employed livelihood enterprises such as trading, agro-processing, food vendoring, and artisanship among others.

Notwithstanding the fact that agricultural income continues to  constitute the backbone of the rural economy in most developing countries including Ghana, incomes from wage labour and other non-farm income generating activities have increasingly become significant (see Bright *et al*. 2000; Lanjouw and Shariff, 2002; IFAD, 2010; FAO, 2012). As such, this paper examined gender perspectives of labour participation in agricultural, non-farm and wage labour livelihood activities undertaken by citizens in Northern Ghana to secure food and income security.

### 3.1 Gendered Labour Participation

Crosstabulation of the various livelihood enterprises by gender was constructed and chi-square calculated to determine whether there exist gender disparities in respondents' participation in these livelihood enterprises. Results of the Chi-square in crosstabulation is presented in the Table 1. Results of the Chi-square analysis revealed significant gender differences in labour participation in food and cash crops production, livestock rearing, non-farm self-employed enterprise and paid wage at 1% level of significance.

As shown in the Table 1, male respondents were more likely to have been engaged in cash crop production as compared with their female counterparts. The Chi-square analysis yielded a chi-square values of $\chi2$ (1) = 262.72; P = 0.00 indicating a strong relationship between gender and labour participation in cash crop production. The most widely cash crop grown in the area included groundnut (peanut), cashew, shea nut and soybean. Whilst only 32% of the 6,332 female respondents saying they have been engaged in cash crop production within the last 12 months, the overwhelming majority (93%) of the 7,248 male respondents have taken part in the production of one cash crop or the other. However, more female respondents than male were found to have been engaged in non-farm self-employed enterprises within the last 12 months. As shown in the Table 1, with a chi-square value of $\chi2$ (1) = 3578.16; P = 0.000 demonstrating significant gender disparities in labour participation in non-farm self-employed livelihood enterprises. About two-third (68%) of the female surveyed reported to have been engaged in non-farm self-employed enterprises as against only 17% of the male respondents. It can therefore be argued, that there is high female participation in non-farm self-employed livelihood enterprises. The non-farm self-employed enterprises mostly engaged in by respondents were petty trading, agro-processing and artisanship.

With regard to wage labour participation, the analysis of the survey data indicate a significant gender disparity in participation in wage labour. With a chi-square value of $\chi2$ (1) = 6894.24; P = 0.000, the study therefore demonstrate that labour participation in wage labour differ significantly at 1% level across gender. Male respondents reported to have been engaged in wage labour compared with females. As shown in the Table1, about 71% of male respondents said they have been engaged in wage labour, both agriculture such as hired farm labour and non-agriculture labour such employees in private or public organizations, as compared with only 21% of their female counterparts.

However, the study did not established a significant difference in male and female labour participation in fishery. Indicating that male respondents as well as female respondents were equally likely to have been engaged in fishery. However, only 20% of both male and female respondents reported to have been in engaged in fishery within the last 12 months. Both black and white Volta River, the main rivers and source of fresh water in Ghana, runs through some of the Districts in the Northern Ghana providing water bodies for fresh water fishery.

**Table 1: Distribution of Labour Participation by Gender**

| Participation in Livelihood Activities | Gender | | Total |
|---|---|---|---|
| **Did you Participate in Food Crop Production** | **Female** | **Male** | |
| Yes | 5,028(79%) | 6,115 (84%) | 11,143(82%) |
| No | 1,304 (21%) | 1,133 (16%) | 2,437(18%) |
| Total | **6,332 (100%)** | **7,248 (100%)** | 13,580(100%) |
| | | $\chi2\,(1) = 56.17; P = 0.001$*** | |
| **Did you Participate in Cash Crop Production** | | | |
| Yes | 2,049(32%) | 6,761 (93%) | 2,720(58%) |
| No | 4,183(68%) | 487(7%) | 4,670(42%) |
| Total | **6,332(100%)** | **7,248 (100%)** | **13,580(100%)** |
| | | $\chi2\,(1) = 262.72; P = 0.000$*** | |
| **Did you Participate in Livestock Rearing** | | | |
| Yes | 5,035 (80%) | 5,977 (83%) | 1, 0952 (80%) |
| No | 1,297 (20%) | 1,271 (17%) | 2,568(20%) |
| Total | 6,332 (100%) | 7,248 (100%) | 13,580(100%) |
| | | $\chi2\,(1) = 16.98; P = 0.001$*** | |
| **Did you Participate in Non-farm Enterprise** | | | |
| Yes | 4,287(68%) | 1242(17%) | 5,529(41%) |
| No | 2045(32%) | 6006 (83%) | 8,051(59%) |
| Total | **6,332 (100%)** | **7,248 (100%)** | **13,580(100%)** |
| | | $\chi2\,(1) = 3578.16; P = 0.000$*** | |
| **Did you Participate in wage labour** | | | |
| Yes | 1303(21%) | 5,163 (71%) | 6,466(48%) |
| No | 5,029 (79%) | 2,085 (29%) | 7,114(52%) |
| Total | **6,332 (100%)** | **7,248 (100%)** | **13,580(100%)** |
| | | $\chi2\,(1) = 3474.62; P = 0.000$*** | |
| **Did you Participate in Fish Farming** | | | |
| Yes | 1,240 (20%) | 1,348 (20%) | 2,588(20%) |
| No | 5,092 (80%) | 5,900  (80%) | 10,992(80%) |
| Total | 6,332   (100%) | 7,248 (100%) | 13,580(100%) |
| | | $\chi2\,(1) = 2.06; P = 0.1512$ | |

**** Variable significant at 1%

Source: Analysis of data from Feed the Future Population Baseline Survey, 2012.

### 3.2 Determinants Female Participation in Livelihood activities

As part of the population baseline survey data collection process, respondents were asked whether they have participated in the various livelihood activities within the last 12 months to the time of the survey which was conducted in June, 2012. The binary response (yes/no) were obtained and subjected in a probit regression analysis in determining factors influencing female participation in the various livelihood activities and results of the analysis is reported in this paper.

**3.2.1 Descriptive Statistics of Variables in the probit model**

Out of the 13,580 respondents constituting the sample of this study, 6,332 of them, representing 46.6%, were females and constituted subjects for the probit analysis conducted to assess factors influencing female labour participation in various livelihood enterprises. Table 2, presents measurement and descriptive statistics of variables used in the probit model.

In the table, the overwhelming majority (79%) of respondents surveyed in the population based line survey participated in food crop production within the last 12months with about one-third (32%) of them indicating that they have been engaged in cash crop production over the period. This was to be expected since agriculture, particularly crop production is the main employer in Ghana (See FAO, 2012). The study demonstrates a wide gap between female participation in food crops and cash crop production, with just 32% of them engaging in cash crop production as compare with 84% engaging in food crop production. Thus, women are more likely to be engaged in food crop production than cash crop, a situation which raises issues of gender gap in earnings, confirming the findings of Elborgh-woytek et al. (2013) which indicated that women spent much of their time in unpaid household activities such as child bearing, cooking among others,. The main food crops grown in the area include cassava, yam, maize, rice, millet and sorghum, with shea nuts, groundnut and cashew being the main cash crops IFPRI (2011).

However, the overwhelming majority of the female surveyed were active participants in their households' livestock production activities, with as high as 80% indicating that they have participated in livestock production within the last 12months to the time of the interview. Women have been identified as playing critical role in livestock production, especially small ruminants such as goat and sheep, and household poultry like local fowls and guinea fowls (see MOFA, 2012). With regard to non-farm self-employed livelihood activities such as trading and artisanship, the majority (68%) of the 6,332 women interviewees have been involved in non-farm livelihood enterprises. Also 21% of them indicated to be engaged in a paid wage labour, while 20% indicated that they had been engaged in fishery within the last 12 months.

The overwhelming majority (78%) of the female respondents were from rural areas, which fairly represent the population dynamics of Northern Ghana as captured in the 2010 Population and Housing Census (see GSS, 2010). The population results reveals that about 69.7%, 79% and 83.7% of the population of Northern region, Upper East and Upper west regions respectively, are from rural areas.

Household status, which was dummied as '1 = male headed household; 0 = otherwise', the analysis showed that the overwhelming majority (82%) of respondents were from male headed households, with a mean of 0.82 (SD = 0.38). Household membership structure, which was measured as dummy (1 = mixed adults; 0 = otherwise) demonstrated a strong indication that most of the female respondents were in households with mixed adults membership structure, scoring a mean of 0.83 (SD = 0.37). Also, households of the 6,332 female surveyed were quite large with a mean household size of about 6 persons (SD = 3.34) per household. This is slightly larger than the national average household size of 4 persons per household as established in the 2010 Population and Housing Census (see GSS, 2012).

Most of the female respondents were within their youthful age, with an average age of 29.26 (SD = 9.23), as shown in the Table 2. However, about two-third of the female respondents were not married. Analysis of marital status which was measured as dummy (1 = married; otherwise = 0) revealed a mean of 0.34 (SSD = 0.47) indicating that most of the respondents were not married and were either single (never married), window, divorced or separated. This finding is quite strange considering the fact that most of the respondents were in their youthful age category and also the fact that it is below the national average of 43% of Ghanaian citizens 12 years and above being married as revealed in the Ghana 2010 Population and Housing Census.

The literacy level of respondents covered in the survey was found to be so low, with only 20% of them indicating they can read and/or write, with an average number of years of formal schooling completed for 4 years (SD = 3). Analysis of working hours per day of the 6,332 female respondents covered in the survey indicate that, the day of the respondents are characterised by a very busy day with little leisure time. As shown in the Table 2, the average working hours of the respondents is 10.8 (SD = 2.15) per day, exceeding the official working hours of 8 hours.

Access to resources is imperative for people to able to participate in various livelihood activities and their capability to harness other livelihood options in diversifying their livelihoods and earnings. However, only 16% of the 6,332 female respondents surveyed indicated that they have borrowed money from formal sources within the last 12 months. Women participation in household production decisions which were measured as dummy (1 = jointly; otherwise = 0) revealed a poor participation of women in their household production decision making process. As shown in the Table 2, only 24% of the 6,332 women surveyed said production decisions in their households were jointly taken by both adult male and female household members. Similar findings were observed with regard to women participation in household decision making regarding to income use and investment. Their control over household resource were equally not better, with only 24% of them indicating that they jointly owned and control their household resources with other adult household members.

**Table 2: Measurement and Descriptive Statistics of Variables in the Model**

| Variable | Variables Description and Measurement | Mean | Std. Dev. |
|---|---|---|---|
| Participation in food crop production | Dummy ( 1= yes; 0 = otherwise) | 0.79 | 0.34 |
| Participation in cash crop production | Dummy ( 1= yes; 0 = otherwise) | 0.32 | 0.50 |
| Participation in Livestock | Dummy (1= yes; 0 = otherwise) | 0.80 | 0.38 |
| Participation in non-farm | Dummy (1 = yes' 0 = otherwise) | 0.68 | 0.50 |
| Participation in Wage Labour | Dummy (1= yes; 0 = otherwise) | 0.21 | 0.49 |
| Participation in fishery | Dummy (1= yes; 0 = otherwise) | 0.20 | 0.39 |
| Location | Dummy(1 = rural;0 = otherwise) | 0.78 | 0.41 |
| Household Status | Dummy (1 = Male headed; 0 = otherwise) | 0.82 | 0.38 |
| Household Membership Structure | Dummy (1 = mixed adult; 0 = otherwise ) | 0.83 | 0.37 |
| Household Size | Number of persons in a household | 5.7 | 3.34 |
| Ethnic Background | Dummy (1 = Mole Dagomba; 0 = otherwise) | 0.49 | 0.50 |
| Age | Age in years | 29.26 | 9.23 |
| Marital Status | Dummy (1 = married; 0 = otherwise) | 0.34 | 0.47 |
| Literacy | Dummy(1= can read and/or write; 0 = otherwise) | 0.20 | 0.40 |
| Number of years of Education | Number of years of formal schooling completed | 4 | 3 |
| Religious Background | Dummy (1 = Islam; 0 = otherwise) | 0.45 | 0.50 |
| Working Hours per day | Number of working hours per day | 10.8 | 2.15 |
| Access to Credit | Dummy (1 = borrowed within 12months; 0 = otherwise) | 0.16 | 0.23 |
| Household Production Decision | Dummy (1 = Jointly; 0 = otherwise) | 2.14 | 0.35 |
| Decision on use of Household income | Dummy (1 = Jointly; 0 = otherwise) | 2.14 | 0.34 |
| Control over  Household Resource | Dummy (1 = Jointly; 0 = otherwise) | 2;14 | 0.34 |

Source: Analysis of Data from USAID/FTF Population Baseline survey, 2012; SD = Standard deviation;

### 3.3.2 Determinants of Female participation in Food Crop Production

Results of the probit analysis conducted to assess factors influencing female participation in food crop production is presented in Table 3 showing coefficients, standard errors and z-scores of the independent variables in the probit model. The model estimation reveals a MacFadden $R^2$ of 0.709 showing that the variables included in the model are able to explain about 71% of the probability that a respondent participated in food crop production within the last 12 months. Also the empirical model best fitness measured by LR chi2 (15) = 41.82 and Prob > chi2 = 0.0000 indicates the best fitness of the model in predicting female participation in food crop production.

As shown in the Table 3, location of respondents, as either rural or urban, ethnic background of respondents, as either Mole Dagomba or otherwise, number of years of formal schooling completed and control over household resource (dummy as 1 = jointly controlled or otherwise = 0) were found to be significant at 1% in determining female participation in food crop production. Demonstrating that respondents from rural areas were more likely to engage in food crop production as against their urban counterpart. This was expected because agriculture in general and crop production in particular, is more practiced in rural areas than in the urban communities. Respondents of the mole Dagomba ethnic group were more likely to have taken part in crop production within the last 12 months as compared with other respondents from different ethnic backgrounds. However, the coefficient of number of years of formal schooling completed, as shown in the Table 3, was negative, indicating that respondents with higher years of formal schooling were less likely to have been engaged in

food crop production. This finding indicates that female respondents who engaged in crop production were less educated, raising issues of their ability to understand and adopt improve technologies which is important for the increase in crop productivity and improvement in food security. This situation have been a challenge to Ghana agricultural sector development and productivity through adoption of improved innovation and best practices in agricultural production. The findings could perhaps explain the observation made by MOFA (2012) that, the country's agriculture is characterised by smallholding, mostly family-operated farm unit of production with mostly illiterate producers who generally used rudimentary technology to produce about 80% of the country's total agricultural output.

Also women who have control over their households resource such as land, labour and capital were found to be more likely to have taken part in food crop production as against those who indicated that they were not involved in household decision making regarding control and use of household productive resources. Similarly, Adam (2014) found that women who had access to household resources were likely to participate in non-farm livelihood activities in Northern region of Ghana.

Also variables such as household status; as either male or female headed, religious background, literacy and decision on use of household income were found to be significant at 5% level of significance in determining female participation in food crop production. The coefficient of the variable 'household status' measured as dummy (1 = male headed; otherwise = 0) was negative, indicating that respondents from female headed households were more likely to have taken part in food crop production as compare with those from male headed households. Also respondents who could read and/or write were less likely to have taken part in food crop production whilst those who could not read and/or write were more likely to be engaged in food crop production.

**Table 3: Estimates of factor influencing Female participation in food crop production**

| Variables | Coef. | Std. Err. | z | P>z |
|---|---|---|---|---|
| Location | 0.1334219 | 0.0327295 | 4.077 | 0.000*** |
| *Household Status* | -0.0045544 | 0.0358247 | -2.918 | 0.024** |
| *Household Structure* | 0.0328745 | 0.0372231 | 0.88 | 0.377 |
| *Household Size* | -0.0044752 | 0.0039597 | -1.13 | 0.258 |
| *Ethnic Background* | 0.1017222 | 0.0281345 | 3.62 | 0.000*** |
| *Religious Background* | 0.0564425 | 0.0281162 | 2.01 | 0.045** |
| *Age* | -0.0004188 | 0.0014126 | -0.30 | 0.767 |
| *Marital Status* | 0.0219391 | 0.0279628 | 0.78 | 0.433 |
| Literacy | -0.1111332 | 0.0385296 | -2.88 | 0.025** |
| *Number of Year of Formal Schooling* | -0.0134515 | 0.0050555 | -2.66 | 0.008*** |
| *Working hours per day* | -0.0066587 | 0.0060999 | -1.09 | 0.275 |
| *Access to credit* | 0.0940339 | 0.0593713 | 1.58 | 0.113 |
| Household Production Decision | -0.1185145 | 0.1094939 | -1.08 | 0.279 |
| Decision on use of Household income | 0.1940929 | 0.1098337 | 1.77 | 0.039** |
| Control over Household Resource | 0.122517 | 0.0380501 | 3.22 | 0.000*** |
| **_cons** | 0.350404 | 0.079283 | 4.42 | 0.000*** |

Number of Observation   =   6,332
LR chi2(15)                  =    41.82
Prob > chi2                  =     0.0000***
MacFadden $R^2$          =     0.7091
Log likelihood        =    -5884.26

*, ** and *** denote that the variable is significance at 1%, 5% and 10% respectively
Analysis of Data from USAID/FTF Population Baseline survey, 2012

### 3.2.3 Determinants of Female participation in Cash Crop Production

For the probit analysis conducted, regarding factors determining female participation in cash crop production, the selected empirical model was found to be best fit with LR chi2(15) of 726.95 (Prob > chi2 = 0.0000) in measuring determinants of female labour participation in cash crop production in Northern Ghana. Also, as indicated by MacFadden $R^2$ = 0.87, implying that the variation of the variables included in the model is capable of explaining 87% of the probability of a respondent engaging in cash crop production within the last 12months.

The probit analysis found variables such as location of respondent, ethnic background, number of years of formal schooling and control over household resource to be significant at 1% in predicting female participation in cash crop production. Whilst the coefficients of the variables location (dummy as 1 = rural area; otherwise = 0) and control over household resource (dummy as 1 = jointly controlled; otherwise =0) were positively related to participation in cash crop production, that of number of years of formal schooling completed was negatively related to participation in cash crop production. Indicating that female respondents from rural areas were more likely to have been engaged in cash crop production compared with those who were from urban areas. Also respondents with some level of formal education were found to be less likely to have been engaged in cash crop production within the last 12 months. However, female respondents' control over household productive

resources was found to be significant predictors of their participation in cash crop production. Whiles those without any formal education were more likely to have been engaged in cash crop production, those with some level of formal education were found to be less likely to engage in cash crop production.

Also respondents' household status, (dummy as 1 = male headed; otherwise = 0), religious background, literacy level and decision on use of household income (dummy as 1 = jointly; otherwise = 0) were found to be significant at 5% in influencing female participation in cash crop production. As shown in the Table 4, the coefficient of household status is negatively related to female participation in cash crop production, indicating that male headed households were found less likely to have been engaged in cash crop production within the last 12 months. This finding appeared not to be incongruent with the gender insensitive land tenure system which characterised land holding and control in Northern Ghana (see Apusigah, 2007; Aryeetey et al., 2007). Literacy was also found to be negatively related with female participation in cash production, implying that respondents who could read and/or write were found less likely to have been engaged in cash crop production than those who could not read and/or write. However respondents' participation in decision regarding use of household income was found to be positively related to their participation in cash crop production.

**Table 4: Estimates of factor influencing Female participation in cash crop production**

| Variables | Coef. | Std. Err. | z | P>z |
|---|---|---|---|---|
| Location | 0.1078324 | 0.0273323 | 3.95 | 0.001*** |
| *Household Status* | -0.0567638 | 0.0301311 | -1.88 | 0.060* |
| *Household Structure* | 0.0374625 | 0.0314321 | 1.19 | 0.233 |
| *Household Size* | 0.006498 | 0.0033646 | 1.93 | 0.053* |
| *Ethnic Background* | 0.0476707 | 0.0235605 | 2.02 | 0.043** |
| *Religious Background* | -0.0334268 | 0.023642 | -1.41 | 0.157 |
| *Age* | -0.0000344 | 0.0011895 | -0.03 | 0.977 |
| *Marital Status* | -0.0548404 | 0.0234541 | -2.34 | 0.019** |
| Literacy | -0.1523286 | 0.0321883 | -4.73 | 0.000*** |
| *Number of Year of Formal Schooling* | -0.0100521 | 0.0043589 | -2.31 | 0.045** |
| *Working hours per day* | -0.0019783 | 0.0051013 | -0.39 | 0.698 |
| *Access to credit* | -0.0112647 | 0.0481706 | -0.23 | 0.815 |
| Household Production Decision | 0.5939372 | 0.0904957 | 6.56 | 0.000*** |
| Decision on use of House income | 0.3214584 | 0.0754192 | 4.26 | 0.000*** |
| Control over Household Resource | 0.2067162 | 0.0318143 | 6.50 | 0.000*** |
| **_cons** | -0.3901214 | 0.1000768 | -3.90 | 0.000*** |

Number of Observation = 6,332
LR chi2(15)             = 726.95
Prob > chi2             = 0.0000***
MacFadden R2       = **0.87**
Log likelihood      = **-9023.5909**

*, ** and *** denote that the variable is significance at 1%, 5% and 10% respectively
Analysis of Data from USAID/FTF Population Baseline survey, 2012

### 3.2.4 Determinants of Female participation in Livestock Production

Estimates of coefficients, standard errors and z-scores of independent variables selected for a probit regression analysis conducted to determine the significant of their influence in female participation in livestock production are presented in the Table 5. As shown in the Table, the selected empirical model with LRch$^2$ (15) of 42.21 (prob>ch$^2$ = 0000) is significant at 1% and best fit the model estimates prediction of factor influencing the participation of female in livestock production. Also with MacFadden R$^2$ of 0.721, further demonstrate the predictability of the dependent variable (female participation in livestock production) by the selected independent variables. This implies that about 72% of the variation in the probability of a respondent's participation in livestock production can be jointly explained by the variation in the selected independent variable.

From the analysis, the variables location, ethnic background, marital status, household production decision, decision on use of household income and control over household resource were found to be significant at 1% and positively related to female participation in livestock production. Demonstrating that respondents from rural areas, those from the Mole Dagomba ethnic group and married women were more likely to have participated in livestock production within the last 12 months compared with those from urban areas, other ethnic groups and those who were not married respectively. Also female respondents surveyed who jointly take decisions on household production with other adult household members, those who had the opportunity to contribute to how household income should be used and those

who had the control over household productive resources were found to be more likely to have been engaged in livestock production within the last 12 months.

Variables such as household status, literacy, number of years of formal schooling and working hours per day were also significant at 1%, but were found to be negatively related to female participation in livestock production. Giving a significant indication and the evidence that respondents who could read and/or write and have a higher number of years of formal schooling were less likely to have been engaged in livestock production within the last 12 months from the time of the interview. Also respondents who worked longer hours a day were found to be less likely to be engaged in livestock production, demonstrating that long hours spent in carrying out unpaid household activities such cooking, tiding up home, child bearing and care among others by females tend to limit their participation in livestock keeping.

**Table 5: Estimates of factor influencing Female participation in livestock production**

| Variables | Coef. | Std. Err. | z | P>z |
|---|---|---|---|---|
| Location | 0.1301656 | 0.0318946 | 4.08 | 0.000*** |
| *Household Status* | -0.103419 | 0.0349793 | -2.96 | 0.005*** |
| *Household Structure* | 0.0195474 | 0.0364134 | 0.54 | 0.591 |
| *Household Size* | -0.0040575 | 0.003875 | -1.05 | 0.295 |
| *Ethnic Background* | 0.1029311 | 0.027489 | 3.74 | 0.000*** |
| *Religious Background* | -0.0139174 | 0.0274646 | -0.51 | 0.612 |
| *Age* | 0.0000826 | 0.0013773 | 0.06 | 0.952 |
| *Marital Status* | 0.1326363 | 0.0272887 | 4.86 | 0.000*** |
| Literacy | -0.1315241 | 0.0377793 | -3.48 | 0.000*** |
| *Number of Year of Formal Schooling* | -0.0139054 | 0.0049602 | -2.80 | 0.005*** |
| *Working hours per day* | -0.0194795 | 0.0059784 | -3.26 | 0.001*** |
| *Access to credit* | 0.1542737 | 0.0570065 | 2.58 | 0.006 |
| Household Production Decision | 0.0540217 | 0.0070213 | 7.69 | 0.000*** |
| Decision on use of House income | 0.0442835 | 0.0072194 | 6.13 | 0.000*** |
| Control over Household Resource | 0.0426257 | 0.0173029 | 2.59 | 0.006*** |
| **_cons** | 0.343096 | 0.0777468 | 4.41 | 0.000*** |

Number of Observation  =   6,332
LR chi2(15)              =    42.21
Prob > chi2             =    0.0002***
MacFadden R2           =     0.721
Log likelihood      =   -6250.36

*, ** and *** denote that the variable is significance at 1%, 5% and 10% respectively
Analysis of Data from USAID/FTF Population Baseline survey, 2012

**3.3.5   Determinants of Female Participation in non-farm Enterprise**

Availability of alternative livelihood options outside agriculture in a typical agriculture dominated areas has become a norm, and women's ability to engage in such enterprises have been identified as very critical in the improvement in women's economic status (Ellis, 1998; Adam, 2014). Analysis of the survey results indicate that the majority (68%) of the 6,332 female 15 years or older interviewed indicated they have engaged in non-farm self-employed livelihood enterprise within the last 12 months.

A probit regression analysis, conducted to identify factors influencing female labour participation in non-farm self-employed livelihood enterprise yielded MacFadden $R^2$ of 0.835 with LR $chi^2$ (15) of 856.21 (prob>$chi^2$ = 0.000). This implies that the empirical model best fits as a predictor of female labour participation in non-farm enterprises and that the independent variables included in the model jointly explain about 84% of the probability of female participation in non-farm enterprise.

Analysis of the estimates coefficients, standard error and z-scores of the independent variables as presented in the Table 6 shows that the variables 'number of years of formal schooling', 'household production decision', 'decision on use of household income' and 'control over household resource' were significant at 1% and positively related to female labour participation in non-farm enterprises. These findings demonstrate that women who took part in their household production decisions, those who jointly decide on use of household income and those who jointly controlled other household productive resources were found to be more likely to have been engaged in non-farm livelihood enterprises. This therefore established that female participation in household decision making and control over household resource are critical determinants of their participation in non-farm self-employed livelihood enterprise and for that matter livelihood diversification outside agriculture. Also, women with more years of formal schooling were found more likely to have been engaged in non-farm enterprises.

However, variables such as location of respondents and marital status were found to be negative and significant at 1% level in influencing female labour participation in non-farm self-employed enterprises. This implies that respondents from urban communities and those who were not married were more likely to have been engaged in non-farm livelihood enterprises than those from rural communities and those who were married respectively.

As shown in the Table 6, variables such as household status and literacy, were significant at 5% in influencing female participation in non-farm enterprises. Whilst household size was negatively related to participation in non-farm activities, implying that smaller households were more likely to have participated in non-farm self-employed enterprise. Literacy was found to be related positively with participation in non-farm livelihood enterprises. Thus, female respondents who could read and/or write were found more to be more likely to have participated in non-farm livelihood activities than those who could not read nor write, A finding similar to the observation made by Adam (2014) while investigating non-farm and gender in Northern region of Ghana.

**Table 6: Estimates of factor influencing Female participation in Non-farm Enterprise**

| Variables | Coef. | Std. Err. | z | P>z |
|---|---|---|---|---|
| Location | -0.0839191 | 0.0275128 | -3.05 | 0.002*** |
| Household Status | -0.0462252 | 0.03024 | -1.53 | 0.126 |
| Household Structure | -0.0263989 | 0.0315526 | -0.84 | 0.403 |
| Household Size | -0.0074619 | 0.003383 | -2.21 | 0.027** |
| Ethnic Background | 0.0304506 | 0.0236694 | 1.29 | 0.198 |
| Religious Background | 0.0180399 | 0.0237486 | 0.76 | 0.447 |
| Age | 0.0000691 | 0.0011944 | 0.06 | 0.954 |
| Marital Status | -0.0651587 | 0.0235538 | -2.77 | 0.006*** |
| Literacy | 0.0761443 | 0.0323336 | 2.35 | 0.019** |
| Number of Year of Formal Schooling | 0.0170821 | 0.0043927 | 3.89 | 0.001*** |
| Working hours per day | -0.0011058 | 0.0051246 | -0.22 | 0.829 |
| Access to credit | 0.0228201 | 0.048373 | 0.47 | 0.637 |
| Household Production Decision | 0.6851024 | 0.0914704 | 7.49 | 0.000*** |
| Decision on use of House income | 0.4009605 | 0.0756766 | 5.30 | 0.000*** |
| Control over Household Resource | 0.1158648 | 0.0319436 | 3.63 | 0.001*** |
| _cons | 0.2565687 | 0.1004615 | 2.55 | 0.015** |

Number of Observation   =    6,332
LR chi2(15)                    =    856.21
Prob > chi2                    =    0.0000***
MacFadden R2                =    0.835
Log likelihood         =    -8923.1303

*, ** and *** denote that the variable is significance at 1%, 5% and 10% respectively
Analysis of Data from USAID/FTF Population Baseline survey, 2012

**3.2.6 Determinants of Female participation in Wage Labour**

Studies (see Blackden and Hallward-Driemeier, 2013; Elborgah-Woytek et al, 2013) have demonstrated that women time is heavily spent on unpaid household activities which are often not accounted for in estimating their economic contribution to households and to national economies. Analysis of the survey data revealed that only (21%) of the 6,332 female reported to have taken part in a paid wage labour within the last 12 months. The paid wage labour common in the study area included employment in formal institutions, both public or private organizations, agricultural labour such as working on other people farms for wage, hired labour in informal enterprises such as restaurants or chop bars, head porters among others.

In assessing factors influencing female participation in labour market regarding wage labour, a probit regression analysis was conducted and the model estimates of coefficients and standard errors are presented in the Table 7. The model estimate reveals a MacFadden $R^2$ of 0.809 demonstrating that the selected variables in the model can jointly explain about 81% of the probability that a respondent participated in wage labour within the last 12 months.

From the analysis variables such as ethnic background of respondents, literacy, number of years of formal schooling and working hours were found to be significant at 1% level in determining respondents' participation in wage labour. Whiles, ethnic background and

working hours per day were negatively related to participation in wage labour, literacy and number of years of formal schooling were positively related to participation in wage labour. This implies that respondents of Mole Dagomba ethnic background were less likely to have engaged in wage labour within the last 12 months to the time of the survey than those of other ethnic groupings. Also respondents who work long hours a day were less likely to have been engaged in wage labour. However, female respondents who were able to read and/or write and those with more years of formal schooling were more likely to have been engaged in wage labour than those of lesser years of formal schooling and could neither read nor write.

Also variables such as location of respondents, household production decision, decision on use of household income and control over household resources were significant at 5% and positively related to female labour participation in wage labour. Thus, respondents from urban areas, those who participate in their household production decisions, and use of income and those with control over household resources were more likely to have been engaged in wage labour within the last 12 months. Marital status of respondents was found to be significant at 10% and negatively related to participation in wage labour among the female surveyed. Meaning that respondents who were not married were more likely to have taken part in wage labour within the last 12 months to the time of the interview.

**Table 7: Estimates of factor influencing Female participation in Wage Labour**

| Variables | Coef. | Std. Err. | z | P>z |
|---|---|---|---|---|
| Location | 0.0688145 | 0.027698 | 2.48 | 0.013** |
| Household Status | 0.0462578 | 0.0304423 | 1.52 | 0.129 |
| Household Structure | 0.015992 | 0.0317511 | 0.50 | 0.614 |
| Household Size | 0.0017084 | 0.0033892 | 0.50 | 0.614 |
| Ethnic Background | -0.0817031 | 0.0237291 | -3.44 | 0.001*** |
| Religious Background | -0.0303207 | 0.0238165 | -1.27 | 0.203 |
| Age | 0.0001929 | 0.0011973 | 0.16 | 0.872 |
| Marital Status | -0.0402079 | 0.0236641 | -1.70 | 0.089* |
| Literacy | 0.1427531 | 0.0325248 | 4.39 | 0.000*** |
| Number of Year of Formal Schooling | 0.0136503 | 0.0044126 | 3.09 | 0.000*** |
| Working hours per day | -0.0142355 | 0.0051303 | -2.77 | 0.004*** |
| Access to credit | 0.0373907 | 0.048484 | 0.77 | 0.441 |
| Household Production Decision | 0.3872322 | 0.0893789 | 4.33 | 0.000** |
| Decision on use of House income | 0.2306637 | 0.0774901 | 2.98 | 0.003** |
| Control over Household Resource | 0.0873556 | 0.0318745 | 2.74 | 0.006** |
| _cons | -0.4628385 | 0.1019125 | -4.41 | 0.000*** |

Number of Observation   =   6,332
LR chi2(15)                  =   379.42
Prob > chi2                 =   0.0000***
MacFadden R2           =   0.8091
Log likelihood         =   -8854.2476

*, ** and *** denote that the variable is significance at 1%, 5% and 10% respectively
Analysis of Data from USAID/FTF Population Baseline survey, 2012

## 4. CONCLUSION AND RECOMMENDATIONS

The paper examined determinants of female labour participation in on-farm, and non-farm livelihood enterprises among women in Northern Ghana. Analysis of the survey data, established significant gender disparities in labour participation regarding food and cash crop production, livestock rearing, non-farm self-employed enterprises and paid wage at 1% level of significant. With female found more likely to be engaged in non-farm self-employed enterprises such as petty trading and agro-processing, whilst male were found more likely to have participated in cash crop and wage labour within the last 12 months. However, the analysis did not find any significant difference between male and female regarding their participation in fishery. Thus, males were found to be engaged in activities which yield better income as compared to their females counterparts.

The probit regression analysis identified location of respondents, ethnic background, number of years of formal schooling completed and control over household resources as significant at 1% in determining female participation in food crop production. Also variables such as household status, religious background, literacy and decision on use of household income were found to be significant at 5% level of significance in determining female participation in food crop production. With regard to participation in cash crop production, variables such as location, ethnic background, number of years of formal schooling and control over household resources were identified as significant at 1% in predicting female participation in cash crop production. Also respondents' household status, religious background, literacy level and

decision on the use of household income were found to be significant at 5% in influencing female participation in cash crop production.

Also from the probit analysis, the variables location, ethnic background, marital status, household production decisions, decisions on use of household income and control over household resources were found to be significant at 1% and positively related to female participation in livestock production. However, variables such as household status, literacy, number of years of formal schooling and working hour per day were also significant at 1% but however, were found to be negatively related to female participation in livestock production. Results regarding participation in non-farm enterprises, shows that whilst variables 'number of years of formal schooling', 'household production decision', 'decision on use of household income' and 'control over household resources' were significant at 1% and positively related to female labour participation in non-farm enterprises, variables such as household status and literacy, were significant at 5% in influencing female participation in non-farm enterprises.

The probit analysis identified variables ethnic background of respondents, literacy, number of years of formal schooling and working hours were found to be significant at 1% level in determining respondents' participation in wage labour. Also variables such as location of respondents, household production decision, decision on use of household income and control over household resource were significant at 5% and positively related to female labour participation in wage labour.

The results from the analysis imply that females are disadvantaged in labour participation regarding food and cash crop production. However, personal attributes of females such as number of years of formal schooling completed, control over household resources and decision-making significantly influenced female's participation in labour force in farm and non-farm livelihood. It will be important for policies that aimed at improving female participation in high income labour force such as cash crop production and wage labour to use strategies such as improving female's access to household and community resources, enhance their household production decisions, and investment in their formal education. This should be done through the engagement of the relevant stakeholders such as the government, development partners and community leaders, and the development players should have proper understanding of the socio-cultural context of the target communities. This will help to ensure a sustainable development in poor communities.

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