

Determinants of Off-farm Employment Participation of Women in Rural Uganda

Fang Cheng

Professor and Economist at FAO, Rome, Italy

Haisen Zhang

Director, Center for International Development and Innovation Studies, University of International Business and Economics (UIBE),
Address: No. 10 Huixin Dongjie, Chaoyang District, Beijing 100029, China

Nobeji S. Boniphace*

Lecturer and Researcher at Eastern Africa Statistical Training Centre (EASTC) Dar es salaam, Tanzania

Abstract

Off-farm employment in rural areas can be a major contributor to rural poverty reduction and decent rural employment. While women are highly active in the agricultural sector, they are less active than men in off-farm employment. This study analyzes the determinants of participation in off-farm employment of women in rural Uganda. The study is based on a field survey conducted in nine districts with the sample size of 1200 individual females. A two-stage Heckman's sample selection model was applied to capture women's decision to participate and the level of participation in non-farm economic activities. Summary statistics of the survey data from rural Uganda shows that: i) poverty and non-farm employment has a strong correlation, implying the importance of non-farm employment as a means for poverty reduction; and ii) there is a large gender gap to access non-farm employment, but the gender gap has been significantly reduced from group of older age to younger generation. The econometric results finds that the following factors have a significant influence on women's participation in off-farm employment: education level of both the individual and household head (positive in both stages); women's age (negative in both stages); female-headed household (negative in first stage); household head of polygamous marriage (negative in both stages); distance from major town (negative in the first stage); household size (positive in the second stage); dependency ratio (negative in the second stage); access to and use of government extension services (positive in the first stage); access to and use of an agricultural loan (negative in the second stage); and various district dummies variables. The implications of these findings suggest that those policies aimed at enhancing the identified determinants of women off-farm employment can promote income-generating opportunities for women groups in comparable contexts. In order to capitalize on these positive linkages, policies should be designed to improve skills and knowledge by providing education opportunities and increasing access to employment training, assistance services and loans for non-farm activities and by targeting women in female-headed, large and distant households. The government should increase investments in public infrastructure and services, such as roads, telecommunications and emergency support.

Keywords: Off-farm; Rural employment; Participation; Women; Uganda.



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1. Introduction

1.1 Background

The role of agriculture in rural poverty reduction is generally considered positive. However, agriculture alone cannot alleviate rural poverty and rural non-farm employment is vital (De Janvry *et al.*, 2005; International Labour Office, 2008; Siti *et al.*, 2012). Evidence illustrates that non-farm enterprises can act as engines of rural development through income growth and poverty reduction (International Labour Office, 2008). In all rural communities, sustainable off-farm enterprises should be promoted as a necessary means of generating more and better jobs,

Off-farm activities can be classified as wage employment (including cash or food for work) and business or self-employment. Most research has focused on rural non-farm employment since agriculture – as challenged by shrinking farm size, low crop and livestock productivities, and poor agricultural market development – remains too weak of a force to eliminate rural poverty and create decent rural employment (DRE) on its own without accompanying drivers of rural growth (Jean and Lanjouw, 2000). Many developing countries have incorporated rural non-farm employment as a core rural development strategy in their poverty reduction strategy papers (PRSP).

Non-farm incomes account for 35 to 50 percent of rural household income across developing countries and is important in terms of poverty reduction for landless and near-landless households who depend heavily on them for their survival. Non-farm incomes also allow agricultural households to diversify risk, moderate seasonal income swings and finance agricultural input purchases (Haggblade *et al.*, 2010). Over time, the rural non-farm economy (RNFE) has grown rapidly in Africa, contributing significantly to both employment and rural income growth. The

contribution is unlikely to diminish in the future with roughly 170 million new job seekers expected to enter Africa's labor market between 2010 and 2020 (Fox and Primhidzai, 2013; Nagler and Naude, 2017).

Women in rural areas have been subject to a double discrimination as a result of their sex and household location (Alonso and Trillo, 2014). The potentially adverse impacts of gender disparities on growth and poverty reduction have received progressively more policy attention in recent years (Rijkers and Costa, 2012). Inequities in labor markets are of particular concern since labor earnings are the most important source of income for the poor in a vast majority of developing countries, (Lustig, 2000), and poverty amongst women has been attributed to the lack of opportunities in the labor market (Buvinic and Gupta, 1997).

The economic empowerment of rural women and greater gender equality is central to ensuring economic growth and sustainable development. Greater attention to identifying and addressing the differing constraints, needs and priorities of rural women and men in the design and delivery of services or labour recruitment results in higher rates of economic growth and poverty reduction (Clare, 2017b).

In recent decades, globalization and economic development have driven the emergence of two general trends: workers tend to move away from agriculture to manufacturing (and more recently to the services sector) and rural populations (mostly youth) migrate to urban areas. These transitions have specific implications for the role and participation of women in the labor market (Verick, 2014): female labor force participation in developing countries). Hence, it is critical that policymakers understand the nature of women's labor supply and can identify the factors that influence women's labor force participation.

The rural non-farm employment also has important implication on gender relations and employment opportunities for women. Studies have shown that men appear to dominate non-agricultural employment in most countries while others have experienced a "feminization of the agricultural workforce (Clare, 2017a; FAO-ILO-IUF, 2005).

The degree and level of women's participation in economic activities (i.e. farm and off-farm employment) may be influenced by many socio-economic and demographic variables, such as educational attainment and poverty levels. During periods of crisis or shock, women are often required to work in order to smooth household consumption (Verick, 2014). Increasing female labor supply can also function essentially as an insurance mechanism for households in response to recession or increasing insecurity in the labor market (Bhalotra and Umana-Aponte, 2010; Standing, 1989).

Beyond economic benefits, women's participation in the labor force may signal declining discrimination and rising women's empowerment (Klasen and Pieters, 2012; Mammen and Paxson, 2000).

Off-farm employment has become important in income and work activities in rural Uganda based on AGRITT/DFID survey data and there is still a participation rate of 36.8 percent on one month or more and 28.0 percent based on six months or more. However, survey data evidences high gender inequality in access to off-farm employment. Male adults are associated with a participation rate of 30.7 percent, while female adults are associated with only 25 percent. Based on national survey data Uganda Bureau of Statistics (UBOS) (2016), female adults have higher shares engaged in subsistence agriculture (49.4 percent) compared with the male adult group (36.9 percent).

While some studies have assessed gender differences in agricultural work (Goldstein, 2008; Horrell *et al.*, 2007) and entrepreneurship in urban areas, gender-differences in off-farm employment in rural areas have not received much attention. This is unfortunate since non-farm enterprises account for a substantial share of rural income and employment (Haggblade *et al.*, 2007).

There are a limited studies available on the non-farm economy and only a few on women's participation in non-farm employment within the literature. This paper fills that gap by providing relevant data for identifying the determinants of women's participation in non-farm employment.

1.2. Economic Context in Rural Uganda

Uganda has a total population of 39.6 million, of which roughly 50 percent are female (Uganda Bureau of Statistics (UBOS), 2017). With a high fertility rate around 7 percent in rural areas, Uganda has one of the fastest growth populations in the world. The major share of the population is younger than 25 years. By 2050 it will surpass Kenya as the second most populous country in Eastern Africa (after Tanzania) (FAO, 2017). Rapid population growth drives the expansion of the labor force, carrying significant implications for economic growth and DRE outcomes, particularly for women and youth.

The majority of the population in the country (86.3 percent or 33.68 million) live in rural areas and depend on rural employment (OECD, 2015). Poverty reduction strategies in rural areas of Uganda are closely associated with the diversification of household livelihood portfolios away from agriculture towards non-farm household enterprises. Diversification away from the agricultural sector increases and stabilises household incomes and improves household welfare and food security. Based on a government household survey report,¹ the percentage of households operating a non-farm enterprise in Uganda grew markedly during the 1990s, and expanded from 19 percent in 2002/03 to 24 percent in 2012/13. However, the proportion relying on agriculture as their main source of earnings nevertheless stayed relatively stable at around 42 percent. Subsistence farming remains the main source of employment and off-farm employment opportunities are very limited. Most households adopt non-farm enterprises

¹

https://www.google.it/?gfe_rd=cr&ei=azc0WNmCGJPN8gfcsozIDg&gws_rd=ssl#q=uganda+national+household+survey+2012/13+report

or activities as a supplementary source of income, while only a small proportion of households shift away from agriculture entirely.

In Uganda, women constitute 76 percent of the agricultural labor force (Ministry of Finance Planning and Economic Development (MOFPED), 2014; OECD, 2015). As in many other developing African countries, women face more challenges than men in the job market as a result of the gendered, social, and geographical constraints reducing women's rural employment opportunities, particularly in the non-agricultural sectors. Overall, females constituted 45 percent of the persons in employment across all sectors. Compared with males (62.7 percent), the proportion of females in paid employment was much lower (37.3 percent), while female have a higher share in self-employment (52.6 percent to 47.4 percent, respectively) (UNHS 2012/13).

In Uganda, the employment to population ratio for females is much lower compared with that of males (41.3 percent to 54.9 percent, respectively); a greater share of females work in subsistence agriculture than that of males (49.4 percent to 36.9 percent, respectively) based on UNHS 2012/13.

In addition, Uganda has the youngest population in the world, with over 60 percent of the population under 18 years of age and an enormous "youth bulge". An estimated 700 000 people enter the labor market every year, posing a great challenge to the country to provide economic opportunity given the limited capacity of the private sector to generate decent and productive jobs.

Therefore, the creation of non-farm employment opportunities is essential for women's economic employment and to generate decent and productive jobs for youth, in particular for girls.

1.3. Overall Policy Framework and Decent Rural Employment Prospects

Land scarcity and increasing fragmentation of already very small farm plots, coupled with a growing population, implies that the non-farm sector must absorb an increasing supply of labor. Policy makers in Uganda are therefore working on alternative development strategies to promote non-farm income-generating opportunities.

Uganda's overall policy framework is very conducive to rural employment creation with its focus on women's employment and economic empowerment, youth employment, and skills development of the workforce. The National Development Plan (NDP) II specified rural employment and investment as key issues for the country's development process, and promotes DRE, including youth and women as target groups.

Both the National Employment Policy (NEP) and National Action Plan for Youth Employment (NAPYE) set the rural and agricultural sector among their main action areas. Similarly, the National Agriculture Policy sets out commitments to employment generation and improved working conditions in the sector. The current draft of the Agriculture Sector Plan 2015/16-2019/20 indicates plans by the Government to actualize commitments through a strategy for youth in agriculture. However, the Agriculture Sector Development Strategy and Investment Plan in force do not translate these commitments into action.

The Ministry of Gender, Labor and Social Development (MGLSD) is the main stakeholder on DRE and is responsible for the country's youth employment programmes, such as the Youth Livelihood, Uganda Women Entrepreneurship Programme (UWEP); Green Jobs Programmes; and the Youth Venture Capital Fund. The National Organization of Trade Unions (NOTU) is also an important actor on DRE and has recently amended its constitution so that also the self-employed can join. The Uganda National Farmers' Federation (UNFFE), the National Youth Council and the Uganda's National Youth Network are also potential partners on DRE.

The Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) is mainly focused on enhancing agricultural productivity with small emphasis on rural employment: where women and youth are increasingly targeted as beneficiaries, yet a structured strategy seems to be missing.

FAO is implementing an Integrated Country Approach programme for promoting decent rural youth employment (2015 – 2018), as well as a programme for youth in aquaculture. The ILO is active in the country on DRE objectives, and in particular on rural youth employment and entrepreneurship promotion. With UNDP, the ILO is a co-leader on the UN Roadmap for the UN Youth Employment and Engagement Convergence Area. The DFID is another active agent on DRE in Uganda and implements the Northern Uganda Youth Entrepreneurship Programme (2013 – 2015), which aims to support the livelihoods of young people through entrepreneurship.

1.4. Research Objectives

While some rural households participate in non-farm activities to take advantage of economic opportunities, others are pushed into non-farm employment as a result of the absence of on-farm employment. Therefore, identifying which factors determine the decision to participate in off-farm employment and the level of participation of farm households (i.e. push or pull factor) is key for policy makers to understand why an individual enters the non-farm rural labor market, where each scenario may require different enabling policy responses.

Studies on the decision to participate in off-farm employment by Ugandan women are very limited. Existing literature on the determinants of off-farm participation does not consider the drivers of the level of participation, which can shed light onto those variables responsible for impending or enhancing off-farm participation.

Off-farm employment participation for women has implications for poverty and women's empowerment. In this context, this study contributes to the knowledge of the determinants and drivers of off-farm employment participation of rural females in Uganda based on the household/individual data collected in rural areas. The study explores the determinants of women's decision to enter the off-farm labor force and the length (months in a year) of participation. The scope of the analysis is the individual and household level from a demographic and socio-economic perspective, including community variables and factors related to agricultural production and policies.

Therefore, this study adds to the literature on the determinants of off-farm employment, in particular the factors that condition women participation. Identifying these determinants is necessary for understanding their implications for women's overall wellbeing and growth of the labor force in the country.

The objective of this study is to identify the determinants of off-farm participation for women in farm-based households in Uganda. Specifically, the study aims:

- 1) To provide descriptive analysis on the situation of non-farm employment by gender and age group;
- 2) To identify factors that affect women's decision to participate in off-farm employment and the intensity of the participation by women; and
- 3) To make evidence-based policy recommendations.

2. Research Methodology

2.1. Data and Sample Selection

Using the sample random technique, a total of 262 farmers were selected for the study. These households were located in nine districts in Uganda: Kiboga, Kyankwanzi, Luweero, Lwengo, Mityana, Mubende, Nakaseke, Nakasongola, and Sembabule.

Questionnaires were designed and tested by the DFID project team and surveys were conducted in 2014 by a country survey team led by Makerere University. The data were computerized in SPSS software and processed by experts and professionals from Makerere University.

Table 1 presents the sample (at the household level) by district and sex of responder. Most of the farmers/responders interviewed were male (60.7 percent), which can be attributed to the gender roles as defined by cultural norms in Uganda. Women are confined to more domestic roles as compared to their male counterparts. Further, women are less educated, which makes them less confident and more reserved. Since males are more involved in the public domain, they tend to be more opportunities to give their voices than females. Males are also expected to be the ones to receive visitors in the household and to attend to their concerns, given that they are the main decision makers.

Table-1. Sample distribution by district and sex

District	Female	Male	Total
Kiboga	13	24	37
Kyankwanzi	18	30	48
Luweero	6	24	30
Lwengo	19	20	39
Mityana	2	0	2
Mubende	2	4	6
Nakaseke	19	21	40
Nakasongola	21	9	30
Sembabule	3	27	30
Total	103	159	262

The total number of individuals covered in 262 households in the sample is 1464 with 958 adults (age range from 15 to 64) and 484 children (age under 15). Among adults, there are 449 females and 509 males, and 382 youth (age range from 15 to 24).

In addition to the household level survey, in-depth key informant interviews were conducted by the project team. The following policy makers and stakeholders were interviewed: Uganda Grain Council; FIT Uganda (private agricultural market information service provider); National Agricultural Advisory Services (NAADS); Parliamentary Committee on Agriculture in the Uganda Parliament Building; several big cattle farms (ranchers) and maize producers (Estates) in the Nakaseke and Mubende districts; slaughter houses, and wholesale and retail markets in Kampala district; and Traders in Kampala.

2.2. Econometrics Approach

In this study, the specification of the empirical models used to determine the factors influencing women's decision to participate in off-farm employment follows the Heckman sample selection model (Bellemare and Barrett, 2006; Bhatta and Årethun, 2013; Gotez, 1992; Heltberg and Trap, 2002; Holloway *et al.*, 2004; Key *et al.*, 2000).

When sample selection is a difficult, Heckman's model employs a probit analysis to estimate the probability of participation and the Inverse Mills Ratio computed from the probit regress is used with other explanatory variables to explain variation in the continuous, non-zero outcome variable. Although utility is not directly observed, the actions of economic agents are observed through the choices they make. Suppose that U_j and U_k represent an individual's utility from two choices, which are, correspondingly, denoted by Y_j and Y_k . The linear random utility model could then be specified as equation 1;

$$U_{ij}(\beta_j X_i + e_j) > U_{ik}(\beta_k X_i + e_k), k \neq j \quad (1)$$

Where U_j and U_k are perceived utilities of off-farm labor market participation and non-off-farm market participation choices j and k , respectively, X_i the vector of explanatory variables that influence the decision of each

choice, β_j and U_k utility shifters, and e_j and e_k are error terms assumed to be independently and identically distributed (iid) (Greene, 2000). In this case, if a female adult decides to use option j, it follows that the perceived utility or benefit from option j is greater than the utility from other options (say k) depicted as in equation 2;

$$U_{ij}(\beta_j X_i + e_j) > U_{ik}(\beta_k X_i + e_k), k \neq j \quad (2)$$

The Heckman two-step selection procedure is used to estimate for two equations: first equation to estimate whether a female adult participated in the off-farm work or not, and second to estimate the extent of off-farm work participation (months in 2014). The length of off-farm participation is conditional to the decision to participate in the off-farm job market. The Heckman procedure is a relatively simple procedure for correcting sample selectivity bias (Hoffmann and Kassouf, 2005). In the first step, a selection equation is estimated using a Probit model to predict the probability that an individual female adult participates or not in the off-farm job market as shown equation 3;

$$\text{pr}(Z_i = 1_i | w_i, a) = \Phi(h(w_i, a)) + \varepsilon_i \quad (3)$$

Where Z_i is an indicator variable equal to unity for female adults who participate in the off-farm works, Φ is the standard normal cumulative distribution function, the w_i is a vector of factors affecting the decision to participate in off-farm jobs, the a is a vector of coefficients to be estimated, and ε_i is the error term, as follows:

$$Z_i^* = a w_i + u_i \quad (4)$$

Where Z_i^* is the latent level of utility the female adult gets from participating in the off-farm employment, $u_i \sim N(0,1)$ and,

$$Z_i = 1 \text{ if } Z_i^* > 0 \quad (5)$$

$$Z_i = 0 \text{ if } Z_i^* \leq 0 \quad (6)$$

The second-stage equation is given by:

$$E = (Y_i | Z = 1) = f(X_i, \beta) + \lambda(IMR) \quad (7)$$

Where E is the expectation operator, Y is the (continuous) length of participation, x is a vector of coefficients to be estimated, IMR is Inverse Mills Ratio which is computed from the first step estimation ($IMR = \varphi(h(w_i, \tilde{a})) / \Phi(h(w_i, \tilde{a}))$). Y_i can be expressed as follows:

$$Y_i^* = \beta' x_i + \gamma \lambda_i + u_i \quad (8)$$

Y_i^* is only observed for those female adults who participates in the off-farm work. Where $u_i \sim N(0, \sigma_u) (Z_i = 1)$, in which case $Y_i = Y_i^*$

The model in the first step, which to decide whether to participate in off-farm employment or not, can be specified as:

$$P_i(0,1) = \beta_0 X_0 + \beta_1 X_1 + \beta_2 X_2 + \dots \dots \beta_n X_n + e$$

$$P_i(0,1) = \beta_0 X_0 + \beta_1 age + \beta_2 gend + \beta_3 gend + \beta_4 Hsize + \beta_5 Occup + \beta_6 HsInc + \beta_7 VehOwn + \beta_8 PinOutcm + \varepsilon_i \quad (9)$$

The model in the second step for the level of off-farm employment participation is specified as follows:

$$Y = \beta_0 X_0 + \beta_1 X_1 + \beta_2 X_2 + \dots \dots \beta_n X_n + e \quad (10)$$

In this case, the dependent variable in the first stage is a binary variable, women's off-farm participation, defined as women (age 15 to 64) with off-farm activities as 1 or women without off-farm participation as 0. The purpose of this first stage is to identify the determining factors of the probability of being a participant in off-farm activities.

The dependent variable in the second stage in this study is the length (months in the year) of the off-farm employment participation, defined as months in the year (2014) participated in off-farm employment. The purpose of the second stage is to identify the determining factors of the months spent in off-farm employment.

3. Results and Discussion

3.1. Descriptive Statistics

3.1.1. Participation in Rural Farm and off-Farm Employment by Gender and Age Group

Summary statistics on the labour force participation by age and sex groups from the survey data by DFID project is reported in Table 2. The working activities include farm and non-farm employment. There are two working periods in months defined for this study: a) one month or more in a year; and b) six months or more in a year. Out of the 1464 individuals surveyed, the data reveals a higher percentage of participation in farm work (60.1% based on one month or more and 36.6% based on six months or more) than in off-farm work (36.8% on one month or more and 28.0% based on six months or more) across the nine districts.

The survey covers 771 males (52.7%) and 692 females (47.3%) and evidences high gender inequality in farm and off-farm employment participation. Based on the one month (or more) time period, males enjoy higher participation rates in both farm and off-farm sectors than female, and the gap of participation rate is higher for off-farm than farm activities.

Table-2. Rural Uganda: participation in farm and off-farm employment by gender and age group

Age Group	Sex	Obs	Share of number	Worked for at least one month		Worked for at least six months	
				Farm	Non-farm	Farm	Non-farm
Age < 15				37.8%	25.8%	8.9%	22.5%
	Male	244	25.7%	40.2%	27.0%	9.4%	25.0%
	Female	240	25.3%	35.4%	24.6%	8.3%	20.0%
Age: 15-24				62.8%	38.7%	25.7%	33.2%
	Male	207	21.8%	64.7%	36.2%	27.5%	31.4%
	Female	175	18.4%	60.6%	41.7%	23.4%	35.4%
Age: 25-34				68.4%	46.6%	56.4%	34.2%
	Male	122	12.9%	67.2%	54.9%	53.3%	39.3%
	Female	112	11.8%	69.6%	37.5%	59.8%	28.6%
Age: 35-64				81.9%	43.3%	72.2%	26.6%
	Male	180	19.0%	81.7%	55.6%	70.0%	33.9%
	Female	162	17.1%	82.1%	29.6%	74.7%	18.5%
Age: 65 or above				76.2%	38.1%	76.2%	14.3%
	Male	18	1.9%	72.2%	38.9%	72.2%	11.1%
	Female	3	0.3%	100.0%	33.3%	100.0%	33.3%
All Age							
	Male	771	52.7%	61.5%	40.9%	36.8%	30.7%
	Female	692	47.3%	58.5%	32.2%	36.4%	25.0%
Total		1464	100.0%	60.1%	36.8%	36.6%	28.0%

Source: calculated by the authors based on DFID project survey in 2014

Based on the six month (or more) period, the participation rates in the farm sector for both males and females are almost equal (36.8% for male and 36.4% for female), but females have a much lower participation rate (25.0 %) for non-farm activities than males (30.7%). When individuals are further disaggregated by gender and age group, the summary statistics show that there is a declining trend in farm participation from the adult working group (age 35-64) to the child group (age <15) for both males and females and for both time periods. For off-farm employment, the patterns of participation vary by gender and by length of participation.

In the case of one month (or more) for male adults (age 15 to 64), the youth group (age 15 to 24) has a lower participation rate compared to the other two older groups (age 25-34 and age 35-64). However, there is an increasing trend in the participation rate of the younger group in off-farm employment activities.

The data points to a marked change by age group and gender in non-farm employment participation, showing improvement in female participation and a clear increase in the percentage of participants as the age group becomes younger over both one-month (or over) and six month (or over) periods. However, there is no such pattern observed for male participation, but rather a decreasing trend for one-month and a U-shape trend for six month period emerge.

The data shows a strong reduction in the gender gap in access to non-farm activities of the youth group compared with the older group, and strong improvement in access to non-farm employment for female adults overall.

3.1.2. Child (age<15) Labour Participation

The data evidences higher child participation rates in farm activities than in non-farm activities in the case of one month (or more) periods compared to the case of six month (or more) periods, indicating that children spend more time in long-term non-farm labour than long-term farm labour activities.

3.1.3. Older (age > 65) Labour Participation

The data suggests that older females participate more in farm and non-farm activities than males, and older males participate less in farm and non-farm activities than the younger male adult group (age 35-64). Overall, there are more old females than old males in the farm sector.

Table-3. Length (months) of labour participation on-farm and off-farm employment in rural Uganda in 2014, by gender and age group

	All adults	Male adults	Female adults	Male adult/ female adult (%)	Youth adults	Children
All sample						
Months on-farm activities	6.0	5.8	6.2	94%	3.7	1.6
Months off-farm activities	3.5	3.9	3.1	126%	3.5	2.4
Off-farm Participants						
Months on-farm activities	4.7	4.9	4.4	111%	3.0	2.9
Months off-farm activities	8.3	8.2	8.4	98%	9.0	9.2

Source: calculated by the authors based on DFID project survey in 2014

In all survey samples, the average working months per year were 6.0 for on-farm and 3.5 for off-farm employment, respectively. Women worked more on-farm months than men overall (5.8 male and 6.2 female), but fewer months in off-farm employment than men overall (3.9 male and 3.1 female).

In survey samples for one-month (or more) non-farm employment only, women spent more total months in off-farm employment than males (8.2 male and 8.4 female), but fewer months in on-farm employment than males (4.9 male and 4.4 female).

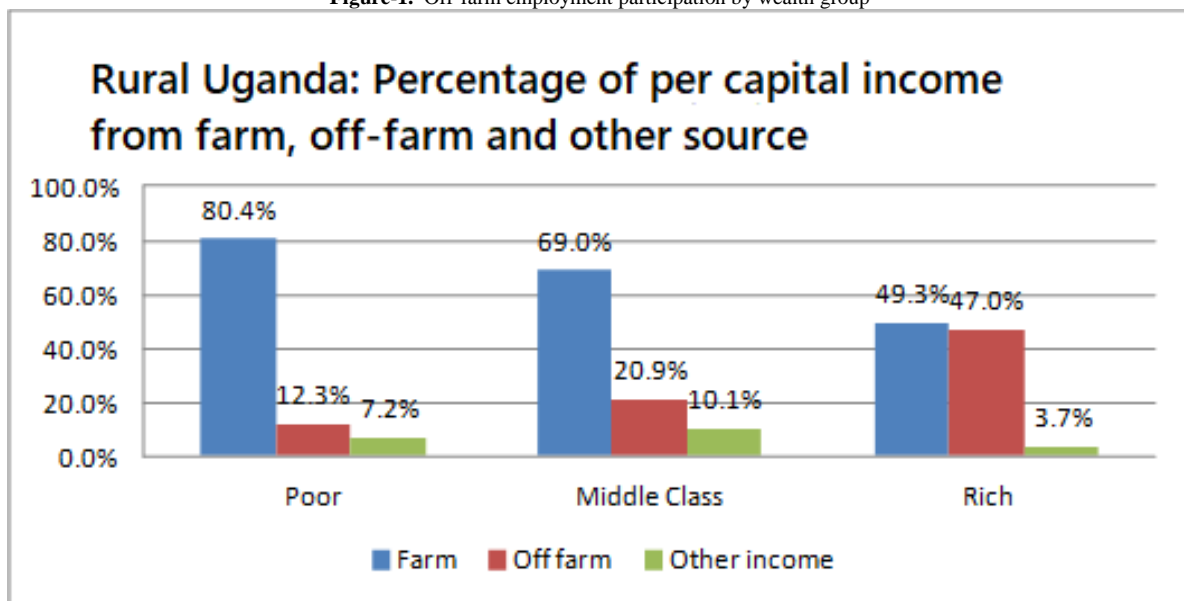
In all survey samples, the youth group participated in on-farm and off-farm employment an average of 3.7 and 3.5 months, respectively. For non-farm activities, the participants averaged 9.0 months, which is longer than the average female and male adult participation. For on-farm activities, the participants averaged 3.0 months, which is shorter than the average male and female adult participation.

For children, on-farm and non-farm employment participation average 1.6 and 2.4 months, respectively, which is much lower than the youth group's participation rates averages of 3.7 and 3.9 months, respectively.

3.2. Non-Farm Employment Participation and Household Income (and Poverty Level)

Figure 1 presents the relationship between farm and off-farm participation and per capita income where the source of income for the lower income group (the poor) is mostly from farm employment rather than non-farm employment. As income groups moves from lower to middle, and then to higher, income levels, the share of farm source income decreases from 80.4% to 69.0%, and then to 49.3%; while the share of non-farm source income increases from 12.3%, to 20.9%, and then to 47.0%.

Figure-1. Off-farm employment participation by wealth group



Source: calculated by the authors based on DFID project survey in 2014

The data suggest that the promotion of non-farm employment opportunities should be the priority of Uganda's national poverty reduction program.

3.3. Major Factors Between Participants and Non-Participants

This section provides an overview of the socio-demographic characteristics of women and households for the participation and non-participation group. The data has been disaggregated in terms of the demographic and socio-economic variables associated with either participation or non-participation in off-farm employment activities to identify which factors contribute to participation outcomes. Description of variables related to female adult participation status in off-farm employment is reported in Table 4.

3.3.1. Age and Marital Status of Female Adult

The summary statistics of the variables appear in Table 4 for female adults (age 15-64 years) considered in the survey. As shown in Table 4, the mean age of female adults in the participation and non-participation group are similar, 31.0 and 30.4 respectively. There is a higher proportion (18% higher) of single/unmarried females to married females in the participation group in comparison to the non-participation group.

3.3.2. Marital Status of Household Head

The majority of household heads are monogamous (79.4% for participants and 82.3% for non-participants) while a substantial number of household heads are polygamous (15.5% for participants and 14.9% for non-participants), and a small percentage of total household heads are unmarried (5.1% for participants and 2.2% for non-participants). When household heads are unmarried or of polygamous, females are more likely to participate in off-farm activities.

3.3.3. Household Size and Dependency Ratio

Female participants of off-farm employment have a relative larger household size (9.4 persons vs. 9.0 persons) and higher dependency ratio (44.1% vs. 43.5%) than those of non-participants.

3.3.4. Female-Headed Household

Female adults in female-headed households are less likely to participate in the off-farm activities than those in the male-headed households. In the non-participation group, there are 8.2% of households headed by females, while in the participation group there are only 5.3% of households headed by females.

3.3.5. Education of Female Adult and Household Head

As presented in Table 4, the highest level of education attained for the majority of females is primary school (31.8 % for participation group and 34.1% for non-participation group), followed by formal education but less than Primary School (20% for participation group and 21.6 % for non-participation group), while a portion of females received no education (18.7% for participation group and 19.2 % for non-participation group). Those females who completed A-level and university degrees occupy a much larger share of the participation group than the non-participation group. Females with below A-level and university degrees have smaller shares in the participation group than in the non-participation group, but shares increase when the level of education increases.

Similarly, females in households where the head has completed higher education are more likely to participate in the non-farm activities than when heads have lower education levels. On average, the participating females belong to households where the head has an education level that is 24% higher than the educational attainment of household heads for non-participating females.

3.3.6. Household Income and Economic Status

Description statistics indicate that economic status of the household also has a significant impact on female non-farm job participation. Females who belong to rich families tend to participate more than those who belong to relatively poor families. The share of the poor in the participation group is about 40% less compared to the non-participation group. Based on group category, the percentage share in participation increased from 70% for the poorest family, to 93% for the poor family, 111% for medium, and 234% for the rich; indicating participation is highly associated with household income.

Similarly, the participation group has a higher average per capita other income (policy/subsidies) than the non-participation group (25.8% higher).

3.3.7. Agricultural Situation and Access to Resources, Institutional Services and Market Networks

i. *Total household land area*

There is a slight difference in per capita land and household land endowment between the participation and non-participation group. On average, the land per household is 38.87 acres for the participation group and 39.44 acres for the non-participation group. On a per capita basis, land endowment is equivalent to 4.94 acres for the participating female and 4.85 acres for the non-participating female.

ii. *Share of maize in total crop area*

There is a very similar percentage of maize area of total area amongst the participation and the non-participation group. The shares for the two groups are 56.7% and 57.2%, respectively.

Years of experience in maize production

The difference in the mean number of years of experience in maize production is very small between the participation and the non-participation groups (13.27 years vs. 13.14 years)

iii. *Access to loan*

The share in access to loans amongst households of the participation and non-participation group in 2014, are similar at 17.1% and 16.9 % respectively.

iv. *Access to insurance*

Overall, the percentage of households that have access to insurance is very small for both groups (less than one per-cent).

v. *Access to town (distance to nearest town)*

As expected, the distance to the nearest town shows a negative relationship to participation in off-farm employment. The longer the distance, the less likely the participation in off-farm employment, on average, there exists a 10.7 km in distance for the participation group and 10.41 km for the non-participation group from the nearest town.

3.3.8. Leadership and Institutional Membership

There is a slightly lower percentage of females from households with leaders (agricultural facilitator, leader of agricultural association) and members of agricultural associations in the participation group as compared with the non-participation group.

Table-4. Description of variables related to female adult participation status in off-farm employment

Factors	Participant	Non-Participant	P/NP (%)
Age (years)	30.98	30.42	101.8%
Marital status (married =0, unmarried=1)	45.2%	38.3%	118.0%
Dummy (=1 if no formal education)	6.1%	8.9%	68.4%
Dummy (=1 if less than Primary)	20.0%	21.6%	92.8%
Dummy (=1 if Completed Primary)	31.8%	34.1%	93.4%
Dummy (=1 if Completed O-level)	18.7%	19.2%	97.4%
Dummy (=1 if Completed A-level)	9.4%	5.6%	169.4%
Dummy (=1 if Completed University)	5.9%	5.1%	115.1%
Dummy (=1 if Other)	3.5%	2.0%	176.4%
Age of household head	47.21	47.64	99.1%
Gender of household head (=1 if female, =0 if male)	5.3%	8.2%	64.4%
Highest level of education completed by household head	2.99	3.02	98.9%
HH head marital status (=1 if monogamous marriage)	79.4%	82.9%	95.8%
HH head marital status (=1 if polygamous marriage)	15.5%	14.9%	104.0%
HH head marital status (=1 if not married)	5.1%	2.2%	229.4%
HH size	9.37	9.04	103.6%
No of dependents (age 0 to 14 and age 65 or over)	4.74	4.41	107.5%
Dependency ratios	44.1%	43.5%	101.3%
Distance from farm household to major town	10.70	10.41	102.9%
Number of years in maize farming	13.27	13.14	101.0%
Member of agricultural association (=1 if yes, =0 if no)	33.4%	33.9%	98.7%
Recipient of agricultural extension service (=1 if yes)	43.0%	43.7%	98.6%
Village leader (=1 if yes, =0 if no)	29.3%	29.2%	100.3%
Leader of agricultural association (=1 if yes, =0 if no)	28.1%	29.6%	94.8%
Size of cultivated land (acre) of household	38.87	39.44	98.6%
Size of cultivated land (acre) per capita	4.94	4.85	101.9%
Annual per capita other incomes	95,098	75,600	125.8%
Poverty situation (= 1 if poor, =0 if not poor)	0.32	0.34	95.3%
Access to loans in 2013 (=1 if yes)	11.8%	12.7%	92.9%
Access to loans in 2014 (=1 if yes)	17.1%	16.9%	101.0%
Insurance on your farm (1= yes)	0.4%	0.4%	88.2%
Access to Information (=1 if yes)	54.4%	52.3%	104.0%
Inaccess to roads (=1 if yes)	49.1%	44.5%	110.3%
Ratio of maize area to total area	56.7%	57.2%	99.2%
Obs	509	449	

3.4. Determinants of off-Farm Employment Participation Decision

The estimated results from the models outlined are presented in [Table 5](#) for the first stage and [Table 6](#) for the second stage. The models are significant ($p < 0.01$) based on F-test for null hypothesis that all coefficients of the covariates in each respective model are jointly equal to zero. In [Table 6](#), the inverse mills ratio for the level of non-farm job participation is significant. This implies there is strong evidence for systematic selectivity bias present due to censoring of non-participation women from the sample. The major factors have statistical influence on the determinants of the female off-farm participation include: education levels of both individual women and household head (positive in both stages); female age (negative in both stages); female-headed household (negative in first stage); household head marriage status of polygamous married (negative in both stages); distance from major town (negative in the first stage); household size (positive in the second stage); dependency ratio (negative in the second stage); received government extension service (positive in the first stage); received agricultural loan (negative in the second stage); and some district dummies variables.

3.4.1 Agricultural Situation and Access to Resources, Institutional Services, and Market Networks

i. Total household land area

Both results show that there is no significant association between land area per capita and women's decision to participate, or between land area per capita and length of off-farm employment.

ii. Share of maize in total crop area

There is a significant and negative relationship between the share of maize area in total crop area and women's decision to participate in non-farm activities.

iii. Years of experience in maize production

No significant influence was found for the number of years of experience in maize production on women's decision to participate, but a significant and positive impact on the intensity of participation was observed.

iv. Access to loan

No significant influence was found for the access to a loan on women's decision to participate, but a significant and negative impact on the intensity of off-farm employment was observed.

v. *Access to insurance*

Overall, the percentage of households that have access to loans is very small (>1%) yet those households that are positively associated with participation in off-farm employment have a relatively higher percentage share of access to loans.

vi. *Distance from major town*

As expected, the distance to town has a significant and negative relationship with women's opportunity to participate in off-farm activities. Long distances may require more time and transaction costs for those seeking work in towns.

3.4.2. Leadership and Institutional Membership

Despite a small difference in the leadership and institutional membership for households were found between the participation and non-participation group, as reported in [Tables 5](#), the results show that no significant association between participation and length of off-farm employment was found. Leadership and institutional membership indicators include acting as agricultural extension facilitator, village leader, cooperative leader, and farmer association member.

3.4.3. District Dummy

For the district effects, the result of participation show that there is no significant difference among districts, with the exception of the Luweero district, where a significant and positive effect is found for participation; and the results from the second stage show that the Lwengo and Mubende districts have significant effects on the length of the participation as reported in [Table 6](#).

Table-5. Tobit Analysis Results for Determinants of Off-farm Employment Participation Decision for Women (age 15 to 64) in Rural Uganda

Parameter	Estimate	Standard Error	Pr > ChiSq
Intercept	-0.5043	0.5137	0.3263
Age (years)	-0.0152	0.0083	0.0675
Marital status (married =0, unmarried=1)	0.0177	0.2041	0.9308
Dummy (=1 if no formal education)	0.3281	0.2859	0.2512
Dummy (=1 if less than Primary)	-0.236	0.206	0.252
Dummy (=1 if Completed O-level)	0.3549	0.1953	0.0692
Dummy (=1 if Completed A-level)	0.4401	0.3141	0.1612
Dummy (=1 if Completed University)	1.2397	0.3954	0.0017
Gender of hh head (=1 if female, =0 if male)	-0.9721	0.3214	0.0025
Highest level of education completed by hh head	0.1292	0.0623	0.0381
Hh head marital status (=1 if polygamous marriage)	-0.3527	0.2105	0.0938
HH head marital status (=1 if not married)	-0.0814	0.4897	0.868
Household size	0.0032	0.017	0.8511
Dependency ratios	0.2859	0.3881	0.4613
Distance from farm household to major town	-0.0326	0.0101	0.0013
Number of years in maize farming	0.0034	0.0078	0.6585
Member of agricultural association (=1 if yes, =0 if no)	-0.0463	0.1911	0.8085
Recipient of agricultural extension service (=1 if yes)	0.4685	0.1904	0.0139
Agric extension facilitator/lead farmer (=1 if yes, =0 if no)	0.071	0.195	0.7159
Village leader (=1 if yes, =0 if no)	0.109	0.1629	0.5036
Leader of agricultural association (=1 if yes, =0 if no)	-0.0125	0.1746	0.9428
Size of cultivated land (acre) of household	0.0012	0.0011	0.2475
Dummy Poorest	-0.0272	0.5013	0.9568
Dummy Poor	0.2646	0.1925	0.1694
Dummy rich	-0.0091	0.36	0.9799
Access to loans in 2013 (=1 if yes)	0.0747	0.25	0.7649
Access to loans in 2014 (=1 if yes)	-0.1775	0.2258	0.4319
Insurance on your farm (1= yes)	-0.5316	1.1332	0.639
Recipient of emergency support (1= yes)	-0.3021	0.1873	0.1068
Access to Information access (=1 if yes)	0.1934	0.1585	0.2224
Low access to roads (=1 if yes)	0.149	0.1608	0.3542
Ratio of maize area to total area	-0.4759	0.241	0.0483

Note: District dummies are significant, but not reported due to space limitation

Table-6. Regression Analysis (Hertman second step) Results for Level of Off-farm Employment participation for Women (age 15 to 64) in Rural Uganda

Variable	Parameter Estimate	Standard Error	Pr > t	Variance Inflation
Intercept	6.37548	2.01323	0.0019	0
Age (years)	-0.09347	0.02987	0.0022	1.65871
Dummy (=1 if no formal education)	-0.44085	1.44241	0.7604	2.18222
Dummy (=1 if less than Primary)	-0.68094	1.01859	0.505	1.94087
Dummy (=1 if Completed O-level)	1.19116	0.78982	0.1339	1.95744
Dummy (=1 if Completed A-level)	1.99118	1.129	0.0801	1.55921
Dummy (=1 if Completed University)	2.77021	1.26063	0.0297	2.47437
Highest level of education completed by household head	0.07219	0.22854	0.7526	2.0199
Household head marital status (=1 if polygamous marriage)	-2.22516	0.97471	0.024	1.77723
Household head marital status (=1 if not married)	0.95066	1.78937	0.5961	1.27746
Household size	0.22811	0.09844	0.022	2.12681
Dependency ratios	-5.15548	1.55269	0.0012	1.78042
Ratio of maize area to total area	0.0647	0.03471	0.0646	1.76266
Size of cultivated land (acre) per capita	0.01999	0.02962	0.501	2.60047
Annual per capita other income	1.9E-06	8.01E-07	0.0189	1.50247
Dummy_SC_Poorest	-2.74313	1.93671	0.159	1.49649
Dymmy_SC_Poor	1.04774	0.80112	0.1932	1.56452
Dummy_SC_rich	-0.60256	1.29176	0.6417	2.99374
Access to loans in 2013 (=1 if yes)	-1.42607	0.84067	0.0922	1.52952
Access to loans in 2014 (=1 if yes)	0.2543	0.79457	0.7494	1.45431
Low access to roads (=1 if yes)	0.64994	0.55741	0.2457	1.29071
District: Kiboga	1.0152	1.18436	0.3929	1.95347
District: Luweero	1.26355	1.07724	0.2429	2.67309
District: Lwengo	1.99931	1.04868	0.0588	2.68085
District: Mubende	4.94483	2.72712	0.0721	1.50228
District: Nakaseke	0.15627	1.11256	0.8885	1.92725
District: Nakasongola	0.53217	1.07209	0.6204	2.64758
District: Sembabule	-0.56749	1.09582	0.6054	2.24633
Inverse Mills Ratio	2.52056	1.18344	0.035	3.98935

4. Conclusions and Recommendations

The patterns and determinants of women's participation in non-farm employment in rural Africa have been neglected in the scholarly literature. In this study we aim to fill this gap by providing new empirical insights using the survey data by DFID project stat set which covers 1400 individual females collected in 2014.

Agriculture is generally considered as a contributor to rural poverty reduction. However, non-farm employment in rural areas can be a major contributor to rural poverty reduction in developing countries. While farming remains the main source of income for rural farming households in Uganda, we find a strong relationship between non-farm participation and per capita income: the rich (group) have a much higher percentage of income from non-farm employment than the poor; while the opposite is true for farm-derived income. This implies the importance of non-farm employment a driver of poverty reduction in rural Uganda.

The summary statistics shows improvement in female participation in non-farm employment and a clear increase in the percentage of participants as the age group becomes younger over both one-month (or over) and six month (or over) periods. There is a strong reduction in the gender gap in access to non-farm activities from the old to the youth group, and strong improvement in access to non-farm employment for female adults overall.

The findings reveal the significant correlation between several factors and women's participation in off-farm employment and the length of time (months) of participation: individual women's age; education level; marital status of household head; size and dependency ratio, location of household; household income; access to and use of agricultural loan; and experience in maize production.

4.1. Education Level and Training

Results from the first and second stages of the estimation suggest that women's chances of being involved in non-farm employment and working for longer time periods increases with the education level of individual women or of the household head. The policy implications of this finding suggest that investment in women's education is an important pathway to enhancing women's participation in non-farm employment, increasing income, and furthering their empowerment.

Based on the evidence found, strategic gender-based interventions should include improving women's literacy rates through better education and increasing their access to training and employment extension advice, which in

turn bolster both women's bargaining power and the overall growth of the economy. Removing structural imbalances and addressing the discriminatory social norms, however, are critical.

Improving women's education is not only important for strengthening linkages with increased human capital, lowered fertility, and improved care (i.e. the social argument), but investment in women's education can also drive national production possibility curve and GDP growth (i.e. economic argument). Similarly, the education level of the household head is significantly and positively related to women's participation in non-farm employment and length (in months) of participation.

Improving basic education is essential and often a necessary condition for other programmes and policies targeted at improving skills and knowledge in rural areas and for making the most of vocational and technical training opportunities. Education may also be the most important variable for entry into the non-farm economy.

Rural populations tend to be more disadvantaged in accessing education and training than those in urban areas. Girls and women are likely to be particularly disadvantaged. Strengthening women's technical and business skills and knowledge is vital to developing economically viable and sustainable businesses.

Skill development include a wide range of areas, such as financial literacy; record keeping; pricing; entrepreneurship and business skills including micro-enterprise management; specialized skills in standards; and negotiation skills for market engagement (Clare, 2017b), Promoting training in businesses start-up and management; promoting development of facilities for child-care, elderly and dependent population; encouraging support and maintenance services in businesses start-up and management; promoting training in leadership and self-esteem for rural women (Alonso and Trillo, 2014),

Enhanced technical vocational education and training (TVET) oriented to both on-farm and off-farm activities and aligned with market-based outcomes and market demand is vital to enhance rural productivity and competitiveness.

4.2. Age, Marriage and Gender of Household Head

4.2.1. Age of Female Adult

Econometric results show that women's age (age 14 to 64) negatively influences both the possibility of their involvement in off-farm activities (yes or no) and level of participation (length of participation), which may be the result of long term efforts by the government to increase youth employment by scaling up education and training programmes. Government support, therefore, should continue to promote such initiatives, targeting young women.

4.2.2. Marriage of Household Head

In general, women's off-farm employment participation is decided by their families (particularly by husbands and in-laws, or parents).

The results reveal that women are often constrained from entering the non-farm labor market when the household head is married to two or more wives (polygamous), indicating that changes in cultural norms and mindsets of husbands/fathers will be critical for promoting women's participation in economic activities outside the agricultural work at home and ultimately empowering them.

4.2.3. Female-Headed Household

The econometric results show the female adults in female-headed household have fewer opportunities to participate in off-farm employment, suggesting a need to policies to support the female-headed households to remove the constraints for non-farm employment participation.

4.3. Market Distance and Rural Infrastructure

Market distance has a significant and negative relationship with women's participation in off-farm employment. Market distance increases transaction costs for the non-farm activities. As a result, it is a disincentive to the female to participate. Similarly, there is some district effects on off-farm employment, in particular on the participation decision and length of the participation. The investment on rural infrastructure (such as roads and communication) and localized development policies will be important for the female's non-farm employment participation.

Significant public investments in rural roads, railways electricity, and telecommunication infrastructure are needed if the government growth target is to be achieved (Ministry of Agriculture Animal Industry and Fisheries (MAAIF), 2010).

4.4. Agricultural and Employment Policies

In Uganda, agricultural, land use, and women's employment policies are generally gender blind or neutral, and therefore sub-optimal, despite women's important share of employment in the agriculture sector and non-farm activities. The focus of the national policies (Ministry of Agriculture Animal Industry and Fisheries (MAAIF), 2013) is at the household, rather than individual level. As a result, the gendered differences in economic opportunities in Uganda are not taken into consideration when policies are designed, and the gender-specific needs of rural women are often overlooked (FAO, 2011).

Achieving gender equality in access to non-farm employment in rural Uganda will require gender-sensitive interventions to redress the current inequalities in economic opportunities and work synergistically towards growth objectives. It is also important to address time poverty women may face according to the econometrics results (dependency ration, marital status of HH heads, Female headed-households).

4.5. Lack of Finance (Credit and Loans)

Greater access to credit and loans along with increasing investment in infrastructure, such as improving roads, telecommunications, and off-farm service in some areas, represent another pathway to increasing women's participation in non-farm economic activities. Agriculture loans illustrate a negative relationship with non-farm job participation. Rural finance and especially credit markets typically do not function well in rural areas in Uganda. Loans for small business and those targeting women were limited. Reallocation of financial services between agricultural activities and off-farm activities in rural areas may also generate improved participation outcomes. In particular females in those households with female-headed, polygamous household head, high dependent ratio, and less educated.

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