Participation in Rural Non-Farm Economic Activities in Ghana

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Abstract

Rural non-farm economic activities (NFEAs) are gaining prominence in most developing economies due to the increasing inability of the farm sector to support rural livelihoods. This study examines the types and determinants of participation in rural NFEAs in the Upper West Region of Ghana. The study uses cross-sectional data from 172 households. Since participation in non-farm economic activities is dichotomous, the logit model, was employed in analysing the determinants of the probability of participation in non-farm economic activities. The study identified twenty nine (28) non-farm economic activities engaged in the study area which are mostly seasonal and 'low return' activities. Most socio-demographic factors were found to be significantly associated with the probability of participation in non-farm economic activities. It is recommended that any intervention aimed at bringing improvement in rural livelihoods through the rural non-farm sector should target these individual specific factors.

Key words: Participation, Non-farm, Economic activities, Livelihood, Ghana.

1. Introduction

In recent times, there has been an increasing recognition that the rural economy is not confined to the agricultural sector alone (Csaki and Lerman, 2000). This is because the number of poor people in rural areas exceeds the capacity of agriculture to provide sustainable livelihood opportunities in many parts of the world (Davis and Bezemer, 2004). In Ghana, the capacity of the agriculture sector alone to continue to sustain the livelihoods of farm households in some parts of the rural north is very much in doubt (Bacho, 2004). The concomitant effects of environmental degradation, rapid population growth, slow spread of technology and low public investment in agriculture account for the increasing inability of the farm sector to sustain rural livelihoods (Government of Ghana, 1997). Therefore dependence upon subsistence farming confronts households with a precarious living, exposing them to adverse contingencies which makes them 'risk-managers'. Consequently, the economic activity of poorer people seeks to spread risk among many sources of income and sustenance rather than depending upon a single occupation (Laird, 2006).

For most rural people in developing and transitional economies therefore, non-farm economic activities (NFEAs) are part of a diversified livelihood portfolio (Davis and Bedemer, 2004). Especially, finding part-time or part-year local non-farm employment (NFE) is vital for people living on small farms in zones with single agricultural seasons and relatively low agricultural productivity. Such employment provides vital income diversification and access to cash at key moments especially in West Africa, where the risks of farming are high and rural savings, credit and insurance mechanisms are poorly developed or not available (Reardon, 1997). Rural non-farm economic activities may among other things; absorb surplus labour in rural areas, help farm-based households spread risks, offer more remunerative activities to supplement or replace agricultural income, offer income potential during the agricultural off-season, and provide a means to cope or survive when farming fails (Gordon and Graig, 2001). In terms of employment, Islam (1997) reports that the share of the non-farm sector in rural employment in developing countries varies from 20% to 50%. In term of income, Reardon (1997) finds rural non-farm income shares in Africa to be ranging from 22% to 93% and Ellis (2000) states that 30–50% is common in sub-Saharan Africa.

In Asia, and Latin America, FAO (1998) estimates non-farm income shares to be 32% and 40% respectively. The rural non-farm sector (RNFS) is also closely related to agriculture. The farm and non-farm economy may be linked directly through production activities, or indirectly through incomes or by investment (Reardon *et al*., 1998). These linkages are important in the development of non-farm enterprises in developing countries and transition economies (Davis and Bedemer, 2004). The potential role of the rural non-farm sector in sustaining rural livelihood which was not traditionally regarded as important, has attracted the attention of the Ghana government and other development organisations, and government policies and strategies are now focussed on the development of the agricultural sector and the generation of non-farming opportunities in rural areas across the country (Government of Ghana, 2002). The significance of such policies cannot be overemphasized especially when 39% of the rural population in Ghana live below the poverty line.

The extreme poverty is concentrated in the rural savannah where the Upper West Region is located. As identified by De Janvry and Sadoulet (2000), non-farm economic activities can be a potential exit path for the poor rural households. But participation in NFEAs is not automatic; it depends on a number of factors which researchers have identified as factors relating to individual, household, and location specific characteristics or assets. However, the specific factors which influence participation in NFEAs in the study area have not been identified. Evidence regarding the subject matter in the area is difficult to come by. This study therefore identifies the types and determinants of probability of participation in NFEAs using micro-level data.

2. Methodology

2.1 Design

Data for this study is cross-sectional data obtained from 172 respondents engaged in rural non-farm economic activities or otherwise, from 15 rural communities in Wa Municipal and Nadowli District in the Upper West Region of Ghana. Both the communities and respondents were selected using a probability sampling procedure. Every community has sections (suburbs) and each was considered as a cluster. Within each cluster, compounds were randomly selected and random sampling technique was further employed to sample households and individuals within the households for the study. The data collection technique employed was semi-structured interview and the instrument for the data collection was a semi-structured questionnaire.

2.2 Data Analysis

The theoretical framework for determining the effects of the factors influencing participation in NFEAs has its roots in the threshold theory of decision making. In this theory, a reaction occurs only after the strength of the stimuli increases beyond the individual's reaction threshold (Hill and Kau, 1973). The decision to participate in NFEAs is therefore dichotomous between two mutually exclusive alternatives: either to participate or not to participate. The probability that an individual makes a particular choice is influenced by a vector of explanatory variables. A particular choice is made when the combined effect of the vector of the explanatory variables reaches the critical level (breaking point). Thus, a decision to participate in NFEAs will occur only when the combined effect of the explanatory variables $(X_i'\beta)$ reaches a certain unobservable critical value Y_i*. So that

$$Y_i = 1 \text{ if } X_i'\beta > Y_i^* \text{ OR } Y_i = 0 \text{ if } X_i'\beta < Y_i^* \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 1$$

Where Y_i* is a latent variable and represent the unobserved level of participation in NFEAs.
By the application of probability theory, the probability that a given individual participates in NFEAs is given by

$$P = \text{Prob}(Y_i=1) = f(X_i'\beta) \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 2$$

and the probability that a given individual does not participate in NFEAs is given by

$$1 - P = \text{Prob}(Y_i=0) = 1 - f(X_i'\beta) \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3$$

In this study, binary logit is employed to estimate the probability of participation in NFEAs. The logit model specified for the study is stated as

$$L = Log\left[\frac{pi}{1-pi}\right] = \beta o + \sum \beta i Xi + Ui \ldots\ldots\ldots\ldots\ldots\ldots (4)$$

Where: Pi = the probability that an individual will participate in NFEAs; β_o = the constant term; β_i = a vector of unknown coefficients of the determinants of participation in NFEAs; X_i= a vector of independent variables that determine participation in NFEAs and includes age, sex, education, and access to credit among others; U_i is the stochastic error term and $i = 1, 2, 3...N$ observations. The Z statistic is used to test the significance of the individual parameters. The likelihood ratio test (LRT) is employed in testing the fitness of the model. The variables used in the model and their measurement are presented in Table 1.

Table 1: Variables and Measurement

Variable	Measurement	Expected Sign
Participation	1=Yes, 0=No	
Sex	1=Male, 0=Female	_
Age	Actual Age of Respondent in years	_
Marital Status	1=Married, 0=Not Married	_
Religion:	1=Yes, 0=No	+
Christian	1=Yes, 0=No	+
	1=Yes, 0=No	+
Muslim	Number of Years of Schooling	+
	1=Yes, 0=No	+
Animist	Number of People in Household	+
Education	1=Yes, 0=No	+
Vocational	Acreage(s)	_
Training	1=Yes, 0=No	+
Household Size	0=Wa Municipal, 1=Nadowli	_
Belongingness to a Group	1=Yes, 0=No	+
Farming Area	Acreage(s)	_
Access to Credit	1=Yes, 0=No	_
Location	1=Nadowli, 0=Wa municipal	_

3. Results and Discussion

3.1 Incidence of Participation in Non-Farm Economic Activities

Out of the 172 respondents sampled for the study, 142 individuals representing 83% were engaged in NFEAs while 30 individuals constituting 17% were not engaged in any NFEA. Among those that are engaged in NFEAs, 76 (53.5%) were men and 66 (46.5%) were women. Among the 30 non-participants in NFEAs, 27 (90%) were males and 3 (10%) were females.

This result suggests that participation in NFEAs is widespread in the study area. Especially, women are far more engaged in NFEAs in the study area compared to men. The study found that out of an average household size 7 members, three (3) members on average are engaged in NFEAs. The incidence of participation in NFEAs is presented in Table 2.

On the composition of the RNFS, the share of the formal and informal sector in the study area is 89% and 11% respectively, indicating that by far, the informal RNFS provides the bulk of NFEAs for the rural households. The formal RNFS employs 17% and 3% of the men and women respectively. Conversely, the informal RNFS engages 83% of the men and 97% of the women.

This results show that more men find employment in the formal RNFS than women while the reverse of this finding holds for the informal RNFS. On one hand, this can be attributed to the general lack of formal non-farm opportunities in the study area. On the other hand, the low levels of education especially among women make them incapable of obtaining jobs in the formal RNFS. Gordon and Craig (2001) also related the greater involvement of women in the informal sector than the formal sector to reasons of differential access to education, childcare responsibilities and social expectations.

Table 2: Level of Participation in Non-Farm Economic Activities

Category	Description	Frequency	Percent
Participation in NFEAs	Participants	142	83
	Non-Participants	30	17
	Total	**172**	**100**
Participants in NFEAs	Male	76	53.5
	Female	66	46.5
	Total	**142**	**100**
Non-Participants in NFEAs	Male	27	90
	Female	3	10
	Total	**30**	**100**
Participation in NFEAs	Formal	15	11
	Informal	127	89
	Total	**142**	**100**
Participants in NFEAs (Formal Sector)	Male	13	87
	Female	2	13
	Total	**15**	**100**
Participants in NFEAs (Infromal sector	Male	63	49.6
	Female	64	50.4
	Total	**127**	**100**

3.2 Types of Rural Non-Farm Economic Activities

The Rural Non-Farm Sector (RNFS) offers diverse employment opportunities for the rural populations, with some engaging in multiple NFEAs in the study area. Among those engaged in NFEAs, 79% are into only one type of NFEA, 16% are into two types of NFEAs and 5% are into three types of NFEAs. The types of NFEAs identified among the study population are presented in Table 3. Segregating the NFEAs into activities common among men, women and both men and women, men non-farm economic activity options far exceed that for the women. Out of the 29 NFEAs exclusively identified from the study, 15 activities were engaged in by only men, 6 were engaged in by only women and 8 activities were common among men and women.

Gordon and Craig (2001) indicated that women have long been constrained in the activities in which they are permitted or able to participate, by tradition, religion, or other social mores. Ellis (1998) and Newman and Canagarajah (2001) also pointed out that the activities in which women are involved are more circumscribed than those for men. This therefore limits the non-farm opportunity options accessible to women. By tradition and social orientation, activities such as blacksmithing, wood carving, masonry, carpentry, butchery, photography, grinding mill operation, tractor operation and mechanical repair works are strictly performed by men and women are rarely if not completely found in them. Conversely, 'pito' (local beer) brewing, sheabutter processing, food vending, pottery, and charcoal/fuel wood production are NFEAs performed by women and men are rarely found in them.

Table 3: Types and Sex Composition of Non-Farm Economic Activities

Activities Common to Men	Activities Common to Women	Activities Common to both Men and Women
• Blacksmithing • Wood Carving • Masonry • Carpentry • Repair Works (Mechanical) • Security Work • Traditional Healing • Lotto Work • Butchery • Agro-Industrial Employment • Photography • Grinding Mill Operation • Tractor Operation • Casual Employment (Building & Construction) • Sanitary Work	• Pito Brewing • Sheabutter Extraction • Food Vending • Pottery • Charcoal/Fuel Wood Production • Tour Work	• Trading • Stone Mining • Retail Shop Operation • Drinking Bar Operation • Teaching • Hairdressing/Barbering • Dressmaking/Tailoring • Weaving (Cloths And Mats)

The NFEAs identified and presented in Table 3 are classified into five groups; extractive, manufacturing/processing, constructive, commercial, and direct services. The results are presented in Table 4. Overall, commercial services dominate the non-farm economic activities (32%), followed by constructive industry (21%), manufacturing (20%), extractive industry (18%) with personal services recording the least (9%). Women dominate commercial services, extractive industry and manufacturing/processing activities while men dominate construction and direct service activities. Most of the NFEAs are however 'low skilled' and hence 'low return' activities. The predominant non-farm economic activities found include trading (livestock, crops and provisions), charcoal and fuel wood production, casual employment in building and construction, pito (local beer) brewing, stone mining, food vending and retail shop operation.

Table 4: Categorization of Non-Farm Economic Activities by Industry

	Male		Female		Total	
NFEA	**Freq.**	**Percent**	**Freq.**	**Percent**	**Freq.**	**Percent**
Commercial	21	24.14	34	40	55	31.98
Extraction	8	9.20	23	27.06	31	18.02
Construction	35	40.23	1	1.18	36	20.93
Manufacturing	14	16.09	21	24.71	35	20.35
Direct Services	9	10.34	6	7.06	15	8.72
Total	87	100	85	100	172	100

3.3 Earnings in the Rural Non-Farm Sector

The earnings from NFEAs in the study area are presented in Table 5. The average non-farm earning per year was found to be GH¢332.68 (US$ 214.56). The average non-farm earnings per year for men and women were found to be GH¢364.86 and GH¢ 295.62 (US$ 190.66) respectively. Even though the average non-farm earnings are relatively low in the study area, men non-farm earnings exceed that of the women. The low earnings suggest that majority of the non-farm activities engaged in, are low return activities. However, there is a huge earning differential between NFEAs found in the formal sector and the informal sector. The average non-farm earnings in the formal and informal sector are GH¢ 839.10 (US$ 541.18) and 272.80 (US$ 175.94) respectively.

Table 5: Earnings in the Rural Non-Farm Sector

Category	Description	Average (GH¢)	Average (US $)[1]
	All	332.68	214.56
	Women	295.62	190.66
Non-farm Income	Men	364.86	235.32
	Formal	839.10	541.18
	Informal	272.80	175.94

3.4 Determinants of Participation in Rural Non-Farm Economic Activities

Equation four (4) was estimated using STATA and the results are presented in Table 6 below reporting the coefficients and odds ratio. The estimated parameters (coefficients) alone do not provide direct information about the effect of changes in the explanatory variables on the probability of participation in NFEAs. To this end, the odds ratios must be computed. This is the ratio of the probability that a person participates in NFEAs to the probability that the person will not participate. The Log Likelihood Ratio (LRT) value of 49.283637 is significant at the 1% level, indicating the fitness of the model good. The variables found to be significantly associated with the probability of participation in NFEAs are sex, age, marital status, education, vocational training, belongingness to a group and location. All the significant variables carried the expected signs of the coefficients stated in Table 1. The probability of participation in NFEAs increases with being a woman. The odds in favour of participating reduce by 6.15 for men. The implication is that women are more likely to go into NFEAs than men in the study area. This finding is consistent with the findings of Newman and Canagarajah (2001) in Ghana and Uganda. The study revealed that, for many men non-farm economic activity ends at the beginning of the farming season, while the women are able to synchronise non-farm activities with that of farm work. According to Griffith et al. (1999), the majority of the poor in sub-Saharan Africa are women and hence has greater need for the income that can be secured through involvement in the RNFS. This finding however contrasts the findings of Lanjouw and Shariff (2002) in India, Lanjouw (2001) in El Salvador and, Lanjouw et al. (2001) in Tanzania.

Similarly the probability of participation in NFEAs decreases with age. Older people stand a 0.966 chance of not participating than their younger counterparts. Thus young people are more likely to take up opportunities in the RNFS but the likelihood of participation declines as they get more and more old. This finding is similar to what Abdulai and Delgado (1999) in Ghana and elsewhere in Bolivia, Vietnam and El Salvador by Sanchez (2005), Hung Pham (2006) and Lanjouw et al (2001) respectively. Also, being married decreases the probability of one participating in NFEAs. Thus, individuals who are singles, divorcees/separated and widows are more likely to engage in NFEAs than married persons. However, the probability of participation in NFEAs increases with number of years of schooling. The odds in favour of participation increase by about 1.132 for educated people. Thus, the more educated a person is, the more likely the person will engage in NFEAs, especially those found in the formal rural non-farm sector. According to Gordon and Graig (2001), better educated members of rural populations have better access to any non-farm employment on offer, and are also more likely to establish their own non-farm businesses. Education was pointed out as a key determinant of participation in the remunerative non-farm sector by De Janvry and Sadoluet (2001) while Meharia (2002) found a strong, significant association between traditional RNFE and low literacy and modern RNFE and high literacy.

Persons who have had some form/level of vocational training are more likely to work non-farm. Undergoing some form of vocational training/apprenticeship either formal or informal, equips the individual with specialist skills to engage in certain non-farm jobs such as tailoring, repair works (motorbikes, tapes/radio), carpentry, and masonry. Such jobs are often characterized by high entry barriers for many of the rural populations due to the specialist skills required. The importance of specialist skills in non-farm employment is indicated by authors such as Reardon et al. (1998) and Bryceson (1999). The probability of participation in NFEAs increases if a person belongs to a group. Thus, belonging to a social network increases ones chances of engaging in NFEAs. Gordon and Graig (2001) found micro-credit schemes to be often associated with group-lending, thus emphasizing the importance of belonging to a group/organization.

[1] Based on the average interbank foreign exchange rate of GhC1.5505 toUS$1 ending December 2011 (Bank of Ghana Statistical Bulletin, December 2011. www.bog.gov.gh/privatecontent/publications/Statistical Bulletin/2011/statbuldec2012.pdf)

Zhang and Li (2003) found Guanxi (social network) to be one of the most important contributing factors to non-farm employment in China next to gender. Persons residing in communities in the Wa Municipal are more likely than those in Nadowli District to engage in NFEAs. The communities located in the Wa Municipal are close to the regional capital and this promotes rural non-farm economic activity. Aside having access to the urban market for their products and services, they are also privy to certain non-farm jobs such as stone gathering which are rear in the Nadowli District. Proximity to the regional capital may also increase the amount of time spend working non-farm as found by Abdulai and Delgado (1999). Johansson (2005) also found location (region) to play vital role in the viability of non-farm activity.

Table 6: Logistic Regression Reporting Coefficients and Odds Ratio

Variable	Coefficient	Odds Ratio	P>z
Constant	6.153313	6.153313	0.002
Sex	-2.884653***	0.0558741***	0.000
Age	-0.0340925*	0.9664821*	0.081
Marital Status	-1.73138*	0.17704*	0.092
Christian	-0.5154327	0.5972421	0.656
Muslim	-0.8504905	0.4272053	0.479
Education	0.1246889*	1.132796*	0.075
Vocational Training	1.879508*	6.55028*	0.045
Household Size	0.0171329	1.01728	0.724
Belongingness to Group	1.582811**	4.868622**	0.008
Farm Size	0.0258617	1.026199	0.668
Access to Credit	1.048288	2.852762	0.165
Location	-1.210583*	0.2980235*	0.060
Log Likelihood=-49.283637	LR Chi (12)=59.48		
Prob>Chi2=0.0000	Pseudo R2=0.3764		

* Significance at 10%; ** Significance at 5%; *** Significance at 1%

Conclusion

Participation in NFEAs is widespread among rural populations in the study area. However, majority of the NFEAs are temporary, 'low skilled' and 'low return' activities. The informal rural non-farm sector provides the bulk of non-farm employment for the rural households. The intensity of performing these NFEAs increases during the off-farming season when the rains cease and farming cannot take place. Although women are far more engaged in the NFEAs than men, the opportunities available for working non-farm are greater for men than that for women. Participation in NFEAs is influenced by several factors and not a single factor. Sex, age, marital status, years of schooling, vocational training, belongingness to group (proxy for social network) and location plays an important role in determining participation in NFEAs in the study area. Hence, policies aimed at improving the rural non-farm sector must concentrate on improving the factors that influence participation in NFEAs. For example, policies that are geared towards strengthening the rural non-farm sector should target the young rural population since they are more likely to take up opportunities in the rural non-farm sector. Education and vocational training should be intensified to permit rural dwellers especially women, to participate in more lucrative non-farm jobs. Since formal vocational training sources are limited, using informal training sources such as the methodology adopted by Livelihood Empowerment and Sustainable Development Programme (LESDEP) in Ghana is essential.

The performance of certain NFEAs such as charcoal/fuel wood production and stone mining predispose the environment to all forms of degradation. Providing alternative NFEAs or regulating such activities will be essential in combating environmental degradation. There is should be programmes/projects aimed at expanding the non-farm economic opportunity options for women and economic infrastructure such as roads, electricity, and communication facilities needs to be provided and /or improved in rural areas to support the performance of NFEAs.

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