

What Drives Off-farm Sector Participation in Rural Nigeria?

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Abstract

The incidence of poverty in Nigeria as in other developing economies is persistently on the rise. About three quarters of the poor households live in the rural areas and are mainly dependent on small-holder agriculture for their livelihood. Their situation is further worsened by declining agricultural output, resulting in decreasing and irregular farm income. Therefore, agriculture alone is not capable of providing sufficient livelihood. In response to these challenges, rural households have devised alternative strategies to mitigate its impact through off-farm sector participation. The current study is therefore set out to examine the factors that drive household's participation in off-farm sector activities in rural Nigeria using data of rural households obtained from the NLSS. Results of the descriptive statistics shows that majority of the households are male headed with only few opportunities to borrow. Also majority of the population in the study area had no access to basic rural infrastructure such as electricity, safe drinking water, and health facilities. Employing a probit model, the empirical results reveal that the participation decisions of rural household are shaped mainly by human and social capital characteristics and farm production factors. Given the results obtained, appropriate policies aimed at stimulating the participation in the off-farm sector should adequately address the capacity of rural households to respond to the incentives provided.

INTRODUCTION

Agriculture and related activities provide livelihood for a majority of the population in developing countries. The sector employs approximately two-thirds of the total labour force and provides a livelihood for about 90 percent of the rural population, with food crops accounting for bulk of their output (IFAD, 2014). However, with the discovery of oil there has been a neglect of other sectors, particularly the agricultural sector. The situation of rural farm households is further worsened by declining agricultural output, resulting in decreasing and irregular farm income. Consequently, the high incidence of off-farm work by rural households and the dwindling share of income from agriculture suggest that agricultural development alone may not be a reliable path way out of poverty in rural areas (Haggblade, 2002; Jatta, 2013).

Evidence from developing countries points towards the growing importance of the rural off-farm sector. This trend has been observed all over Sub-Saharan Africa with a significant proportion of rural households increasingly relying on earnings from the off-farm sector (Lanjouw and Lanjouw, 2001; Oseni and Winters, 2009; Babatunde and Qaim, 2009). Rural households view the sector as an avenue to diversify their incomes throughout the year. Hence, the rural off-farm sector has become an important livelihood option for a significant proportion of the rural population accounting for as much as 35-50 percent of the total income of rural households in developing countries (Reardon et. al., 1998; Haggblade et. al., 2010).

In spite of the importance of the rural off-farm sector, policies targeted at rural development often overlook the role of the off-farm activities (Lanjouw, 1998). This is attributed to the role of the sector not being well understood in the development process as compared to other components of the rural economy. This lack of appreciation of the potential role of the off-farm sector in rural development has been evident in the policies and programmes in Nigeria where there has been no development policy aimed specifically at the growth and development of the rural off-farm sector.

In the light of the above, an attempt at analysing the determinants of farm household participation in off-farm activities can provide valuable insights for informing policy aimed at improving the livelihood of Nigerians, especially the rural poor. This study examines the factors that drive off-farm labour supply of households in rural Nigeria. The objective of the study is in two folds: (1) to describe the socio-demographic characteristics of rural farm households, and (2) to investigate the major determinants of rural farm household decision's to participate in the off-farm sector.

METHODOLOGY

Data

The data employed in this study was obtained from the Nigerian Living Standards Survey conducted from September 2003 to August 2004 by the Nigerian National Bureau of Statistics in collaboration with the World Bank. The survey employed a two-stage stratified random sampling technique to collect the data with a well structured questionnaire over a period of six weeks. The first stage involved a random selection of 120 enumeration areas¹⁹ in each of the states in Nigeria and 60 from the FCT, Abuja. The second stage involved a random selection of five housing units from each of the enumeration areas. A household was then interviewed from each unit with a total sample size of 19,158 households. In this study, we use only the rural data and there are 14, 512 rural households in the survey as the study focuses only on the rural households in Nigeria.

Analytical Tool

Objective one which entails describing the socio-economic characteristics of rural households was achieved employing mean distributions. Objectives two aimed at examining factors that drive off-farm sector participation decisions among rural households was realised employing a probit model.

The decision of the household to undertake off-farm work depends on the specific household characteristics, human capital stock, farm characteristics, locational characteristics and other characteristics that are relevant to off-farm work opportunities. If y denotes the decision of the farm households to

undertake off-farm work, then y takes the value 1 if the rural household decides to work off-farm and 0 otherwise, then:

$$\begin{aligned} \text{Prob}(y = 1/x) &= F(x, \beta) \\ \text{Prob}(y = 0/x) &= 1 - F(x, \beta) \end{aligned}$$

where x denotes the characteristics that explain off-farm labour supply decisions, β reflects the impact of changes in x on the probability of participation and F is the cumulative distribution function (cdf).

A rural household's decision to undertake off-farm work can be expressed in the framework of a discrete choice model. The response variable takes a binary form indicating whether the household (1) decides to work off-farm or (2) not to work off-farm. Model specification to depict the relationship between the probability of choosing to participate or not and the explanatory variables is dependent on the assumption made as regards the distribution of the error term. The most common distributions assumed in the literature are the normal and logistic which corresponds to probit and logit models, respectively. Assuming the error term in the utility model is normally distributed, the analysis can then be carried out using a probit model. As this is a non-linear model, the effect of the explanatory variables is measured in terms of marginal effects.

The marginal effects are obtained from:

$$\frac{\partial \text{Pr}(y_i = 1/x_i)}{\partial x_i} = \frac{\partial E(y_i/x_i)}{\partial x_i} = \phi(x_i' \beta) \beta$$

where $\phi(\cdot)$ is the probability density function.

RESULTS AND DISCUSSION

Socio-demographic Characteristics of Rural Farm Households

Descriptive statistics of the sample are shown in Table 1.1. It is evident from the results that majority of the households in rural Nigeria (86.6 percent) are male headed with female headed households making up just about 13.4 percent of the sample. This confirms that the social system in rural Nigeria is patriarchal owing to religious and cultural factors. Access to credit is an important for both farm and off-farm activities, there are however only few opportunities for rural households to borrow.

Majority of the households (69 percent) have not been successful in accessing any form of credit while 9.5 percent of the households have had occasional access and only 11.2 percent have had access to credit facilities regularly. The major source of this credit is from public financial institutions which generally put in place stringent conditions rural households must fulfil to access credit. Most of the households fail to meet such requirements based on their poverty status.

A significant proportion of the rural households (50.2 percent) had access to land which is available for both farm and off-farm activities. The land tenure system which is still quite traditional provides the opportunity for households to own and operate land passed down as heritage. However a good number of these households (48.9 percent) have for reasons of poverty leased or sold out their lands leaving them landless.

The availability of basic rural infrastructure such as electricity, safe drinking water, health facilities and telecommunication is critical both for on-farm and off-farm activities. As important as the access to these facilities are, majority of the population in the study area has no access to them. In the case of access to electricity, it is evident that only 17.9 percent of rural households reported having electricity supply as against a significant 82.1 percent who are without electricity. The issue of electricity in the study area has been a huge challenge spanning over several years and various attempts by successive government through the power sector road maps have

International Journal Of Agricultural Economics, Management and Development (IJAEMD) produced little results with majority of households even in the urban centres without power.

In spite of the huge resources that Nigeria is been blessed with, poverty especially in the rural areas has been on the rise. This has been attributed to huge corruption and mismanagement by the political class. The assessment by the households themselves of their poverty status further confirms the degree of poverty in the area. Over half of the rural households (52.1 percent) reported that they are very poor with another 29.5 percent claiming they are “averagely” poor. Only 18.3 percent of the households submitted that they were not poor. This result however only reflects self-assessment. This is possibly quite close to the situation on the ground, which may be worse than what is revealed by the figures obtained from the self-assessment of poverty status.

Table1.1 Selected socio-demographic characteristics of rural farm households

Characteristics	Percentage
<i>Gender of household head</i>	
Male	86.6
Female	13.4
<i>Credit access outside home</i>	
Never	65.0
Sometimes	9.50
Always	11.20
<i>Land ownership status</i>	
Own land	50.20
Landless	49.80
<i>Access to electricity</i>	
Yes	82.10
No	17.90
<i>Self assessment of poverty</i>	
Male	52.10
Female	29.10
Female	18.30

Authors’ computation (2015)

Drivers of Off-farm Sector Participation Analysis

Description of variables in the participation model

A set of variables hypothesised to influence the off-farm participation decisions of rural households was included in the model. Beginning with age of the household head which is a dimension of human capital included in the model as a proxy for general experience part of which would be related to the off-farm sector. It is therefore hypothesised that age would positively affect the probability to participate in off-farm work, hence the older household heads with more experience are more likely to take up off-farm work than younger household heads.

Educational level of the household head is another human capital characteristics included in the participation model. A number of previous related studies (see for example, Abdulai and Delgado, 1999; Goodwin and Holt, 2002) has shown evidence that it plays an important role in labour allocation decisions of households. It is hypothesised that education will have a positive effect on the probability to participate in off-farm.

Ownership of land is another variable included in the model and is expected to be directly linked to agricultural production, while households without such rights or access to land could be expected to seek employment in the off-farm sector. Hence, access to land is hypothesised to negatively influence the probability of participation in off-farm work.

Family size and composition forms a part of the social capital factors included in the participation model. It is expected that the presence of young children and elderly members in the household would influence the probability of off-farm. Hence, the number of children (below 6 years) and the number of elderly (above 70 years) was included in the participation model. It is difficult to predict the expected sign of this variable. This is because households with children and elderly members may require additional income sources to augment income from the farm in order to meet various household expenses, hence may increase the probability of taking up off-farm work. In contrast, the presence of dependants in the household could warrant more attention and care required in the household which

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could then lead to the decision to shun off-farm work to provide such needed care.

Other social capital factors hypothesised to influence the participation decisions of farm households includes access to infrastructure, migratory networks and membership of various associations and unions. Access to infrastructure and proximity to urban areas are important factors to be considered in the evaluation of off-farm supply labour supply decisions of rural households. However, there is limited information in our data on both factors especially proximity to the nearest urban centres. To address this challenge, an index of access of infrastructure was computed using a principal component approach¹. Rural household access to infrastructure is expected to increase the proximity to off-farm sector opportunities and hence hypothesised to positively influence the probability of off-farm sector participation.

Rural households with better social networks are more likely to have greater opportunities in the off-farm sector. Such networks are capable of providing information and connections necessary for off-farm sector participation. Therefore, access to such networks is hypothesised to exert a positive influence on the probability of off-farm sector participation. Also, membership of community associations and co-operative unions is another important factor expected to favour diversification into off-farm work, hence it is hypothesised to positively influence the probability of participation in off-farm work.

Farm characteristics in the form of land ownership, and incidence of crop and livestock losses were also included in the model. Ownership of land is directly linked to agricultural production, while households without such rights or access to land could be expected to seek employment in the off-

¹Following Filmer and Pritchett (2001), a principal components approach is employed to construct an access to infrastructure index which is based on a range of assets owned by households. The index includes access to both public goods such as electricity, telephone etc and proximity to schools, health centres, urban areas etc. The mean of the index is defined at or near zero with a higher value indicating better infrastructural access.

farm sector. Hence, access to land is hypothesised to negatively influence the probability of participation in off-farm work. The incidences of both crop failure and livestock loss are expected to push rural households affected into off-farm activities to seek supplementary income to offset the losses, hence hypothesised to increase the probability of participation in off-farm activities.

Participation model

The result of the probit model which represents the stage at which rural households decide whether or not to participate in any off-farm sector activity is presented in Table 1.2. It is evident from the result of the model that the sign of most of the variables were as expected. The results reveal that the decision of rural households to undertake of off-farm work is significantly determined by the age, gender and level of education of the household head.

In terms of gender, this result suggests that male headed households had a higher probability of participating in off-farm work compared to the households headed by females. Such gender bias in off-farm work participation could be attributed among other things to the physical nature of the activities. The significant relationship between age and the decision to undertake off-farm work is in line with similar previous studies (see for example Abdulai and Delgado,1999; Beyene, 2008).

Education of the household head has a significant effect on the probability of participation in off-farm activities. Though education may also increase the productivity in on-farm production, our results confirm that the education of the household head strongly influences the probability of off-farm sector participation. The marginal effect of an additional year of education of the household head on the probability of participation is 0.02. This is in line with findings from previous studies by Oluwatayo (2009); Babatunde and Qaim (2009).

The number of dependants in the household had no significant influence on the decision of households to undertake off-farm work with a negative

effect. Though not significant, one possible explanation of its negative sign is that an increase in the number of dependants in the household mostly children could mean more time needs to be devoted by the spouse and in some cases the head of the household to provide care, and this tightens their time constraint which makes undertaken off-farm work difficult. Other previous studies (see for example, Matshe and Young, 2004) have also reported that the presence of dependants in households had no significant effect on the probability of participation in off-farm work.

Consistent with expectations both access to infrastructure and presence of migratory networks in the household had a significant influence on the probability to undertake off-farm work. This outcome is in line with the findings of Abdulai and Delgado (1999) in their studies in Ghana that the decrease in the cost of information and transportation which stems from improvements in infrastructure enhances the incentives and opportunities for farm households to explore the off-farm sector.

Ownership of land farmed by rural households which is linked to on-farm production was observed to significantly influence the probability of participation in off-farm work. The results reveal that the lack of access to land by rural households increases their probability of participation in off-farm wage activities.

Also, as expected the incidence of crop failure and livestock loss has a significant and positive influence on the probability of participation in off-farm activities. The incidence of both has become a very common feature among small holder farmhouseholds in rural Nigeria. They act as push factors that triggers increased off-farm sector participation to augment the shortfall in income from agriculture as a result of such disasters.

Table1.2 Probit estimates of off-farm participation model

Variable	Marginal Effects	Std. Error
Gender	0.0964**	0.0371
Age	0.0114**	0.0092
Education	0.0226**	0.0031
Dependants	-0.0779	0.0233
Infrastructure	0.0402***	0.0135
Migration network	0.0808*	0.0379
Association	0.0388**	0.0204
Land status	-0.2019	0.1092
Crop failure	0.0385**	0.0188
Livestock loss	0.0179**	0.0079
Marital status	0.1507**	0.0722

Source: Author's computation (2015). Log-likelihood = -7774.687. Note: ***, **, and * refer to significance at the 1, 5 and 10 per cent levels, respectively.

CONCLUSION AND RECOMMENDATIONS

This study focused on the drivers of the decision of rural farm households to undertake off-farm. An understanding of the factors that shape the decision of rural households in labour allocation to the off-farm sector is a pertinent tool to informing policies on the promotion of the sector which has the capacity to bring about rapid rural development. The results of the study confirms that the decisions to participate in off-farm sector activities by rural households are influenced by variables categorised as human and social characteristics, farm and production factors. The study recommends among other things that appropriate policies aimed at stimulating the participation in the off-farm sector should adequately address the capacity of rural households to respond to the incentives provided.

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