ISSN-L: 2223-9553, ISSN: 2223-9944
Vol. 2, No. 2, March 2012

INCOME DIVERSIFICATION DETERMINANTS AMONG FARMING HOUSEHOLDS IN KONDUGA, BORNO STATE, NIGERIA

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ABSTRACT

The involvement of most farming households in income diversification activities for sustainable rural livelihood cannot be overemphasised. Diversification is therefore seen as a way to secure income and to increase food security. It is obvious that most rural households in the study area are involved in off-farm activities as a way of supplementing income from agriculture hence diversifying their income sources and improving their income levels. This paper examined the determinants of income diversification in rural farming households in Konduga Local Government Area of Borno State. Both descriptive and multiple regression analysis were employed to achieve the objectives of the research. The result show that age, educational level of household head and ownership of assets influence income diversification while household size, access to loan and marital status did not. Most households were involved in income diversification activities such as petty trading, matting and tailoring. Therefore, from policy perspective, the presence of agricultural development institutions in rural areas that would promote access to credit facilities and ultimately increase income should be considered. To enhance income diversification, it is important to improve rural infrastructure in terms of provision of electricity and improving access to markets.

Keywords: *Diversification, sustailable rural livehood, agriculture development*

INTRODUCTION

Worldwide, the rural sector harbours the vast majority of the poor, accounting for more than 70% of the total population of 6,602,224,175 (World Bank, 2007). The rural households in sub-Saharan African countries usually have to cope with both poverty and income variability to shift from subsistence agriculture to a more pluriform society where farm and non-farm opportunities are available. Federal Office of Statistics, (2004) revealed that between 1980 and 2004 in Nigeria, rural poverty were higher than urban poverty and the majority of the rural poor derive their livelihood from subsistence agriculture. The common view in the international literature on rural development also have been that of a sector driven almost entirely by agriculture, suggesting that rural households depend on the production of food and export crops for their livelihood. Rural income is equated with farm income and even more with agricultural income. However, very few household collect all their income from one source and use their assets in just one activity. Multiple motives prompt households to diversity incomes and activities (Barrett, Reardon and Webb, 2001). The literature shows that wage income and off-farm self-employment income account for richer household. Diversification has then become the norm. Diversification of income sources has been put forward as one of the strategies households employ to minimize household income variability and to ensure a minimum level of income, (Alderman and Paxson, 1992).

Multiple motives prompt households and individuals to diversify assets, income and activities. The first set of motives comprise what are traditionally termed “push factors” such as risk reduction, response to diminishing factors returns in any given use (for example family labour supply in the presence of land constraints driven by population pressure and fragmented landholding), reaction to crises or liquidity constraints, high transaction costs that induce household to self provision in several

goods and services. The second set of motives comprise "pull factors" realization of strategic complementaries between activities such as crop-livestock integration or milling and hog production specialization according to comparative advantage accorded by superior technologies, skills or endowments (Davis and Pearse, 2001).

Diversification, therefore refers to the patterns individuals' voluntary exchange of assets and their allocation of assets across various activities (on- and off-farm) so as to achieve an optimal balance between expected returns and risk exposure conditional on the constraints they face. (Warren 2002) observed that rural income has generally occurred as a result of an increased importance of off-farm wage (labour in household) income portfolio or through the development of new forms of non-farm/non-site production of non-convectional marketable commodities. In both cases, diversification ranges from a temporary change of household income portfolio (occasional diversification) to a deliberate attempt to optimize household capacity to take advantage of ever-changing opportunities and cope with unexpected constraints (strategic diversification).

By keeping the capability to operate a heterogeneous set of activities, diversifying households are likely to enjoy higher "flexibility" and "resilience" capacity than agricultural dependents rural households. Thus, it is not surprising that in the lights of the reiterated environmental, economic and political shocks affecting rural areas in developing countries, diversification has been, during the last 30 years, increasingly attractive for many rural households (Warren 2002). This makes non-farm income determinants imperative to evolve strategies adaptable to local rural farm household.

The trust of this study is therefore to examine income diversification determinants among farming households in Konduga, Borno State. The specific objectives are to:

a. examine the socio-economic characteristics of respondents;
b. identify the household income diversification sources; and
c. identify the determinants of household income.

Determinants of Diversification

In the past years, governments of developing countries (World Bank, 1998) have focused almost exclusively on agricultural developments as the way to reduce rural poverty and achieve sustainable economic growth. Despite this narrow view, it is evident in developing regions that the rural sector is much more than just farming. Reardon *et al*; (1998) summarized the evidence regarding the nature, importance, determinants and effects on farm households of rural non-farm activity in developing regions. They show the growing importance of rural non-farm activity that accounts for roughly 25% of employments and as much as 40% of the incomes generated in rural Latin America. Data from other regions of the world also show sizable income shares for the non-farm rural sector (32% in Asia and 42% in Africa).

Reardon *et al*; (1998) also show that although the pattern of income diversification between farm and non-farm activities varies sharply across regions, it is clearly linked to the assets or endowments of rural households. It is obvious that non-farm earnings account for a considerable share of farm household income in rural Africa, typically more so than in other world regions. The first logical question is: why do households diversify?

Barrett *et al*; (2001) opined that farm households' diversification into non-farm activities emerge naturally from diminishing or time varying returns to labour or land, from markets failures (e.g. for credit) or friction (e.g. for mobility or entry into high return niches) from ex- ante risk management, and from export coping with diverse shocks where returns to production assets vary across time (e.g. land, labour or livestock across dry and wet seasons) or among individuals within a household or households within a community, data aggregated across time, individuals or households will exhibit diverse assets, activities and income even if there is specialization according to comparative advantage at the level of individuals.

ISSN-L: 2223-9553, ISSN: 2223-9944
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The determinants of participation in and returns to rural non-farm activities include the households' assets endowment (quantity and quality) and its access to public goods and services as shown in various studies such as (Reardon *et al*; 1998b, de Janvry *and Sadoulet* 2001 and Elbers and Lanjouw, 2001). For particular activities, such as education, some households are "pushed" to diversify their activities off-farm only to cope with external shocks to their own farming (such as drought or a steep decline in farm-gate prices). Or, households may be "pulled" into non-farm activities because it often pays more than farming and generates cash.

Gender relationships are also important in shaping diversification process. Social organisation and culture can significantly influence the relative access of diverse gender (and age groups) to household's capital assets (Ellis, 2000; Gladwin *et al*; 2001; Dolan, 2002) or constraints promote their mobility. This might result in a different degree of involvement in diversification activities and/or in an unequal distribution of their benefits between genders. (Warren 2001). In some activities, migratory wage labour or off-farm enterprises are basically men business, which results in transferring to women the whole responsibilities of conventional subsistence and cash cropping (the so called "feminisation of agriculture"). However, in other cultures, women are often able to play an autonomous role on their own small-scale enterprises or migrating to town or abroad.

METHODOLOGY

The study was conducted in Borno State located in the north eastern corner of Nigeria. Ecologically, the state ranges from northern Guinea savanna in the South-east to the Sahel in the north and a larger part of the state lies in the Sahelian zone. The annual rainfall ranges from 600mm in the north to 1200mm in the south that extends over a growing season of between 100 to 180 days. Based on the 2006 provisional census figures, Borno state has a population of 4,151,193 people and a population density of approximately 60 in habitants per km^2. The main source of livelihood is from agriculture. In the north, the major crops grown are millet, sorghum and cowpea. In the savannas of the southern part of the State, major crops grown are maize, sorghum, cowpea, groundnuts, rice and recently soybeans (Kwaghe *et al;* 2008).

The data was obtained through a survey of 150 farming households in Konduga Local Government Area (LGA) of Borno State. The main instruments of data collection were well-structured questionnaires administered to mainly farming households in the study area. Konduga LGA was purposefully selected because it represents a rural settlement where farming is the primary occupation. Thirty farming households were randomly selected from five wards in the study area totaling 150 respondents. 110 respondents were found suitable and this represents the sample size.

A combination of analytical tools was employed in this study. These included descriptive statistics (e.g. means, frequencies, percentages), was used to examine the socioeconomic characteristics of the respondents. Multiple regression analysis was used to examine the determinants of income diversification among farming households in the study area. The general form of the model is implicitly stated as:

$$Y = B_0 + B_1\,Ar + B_2\,Educ + B_3\,Oa + B_4\,Hs + B_5\,Al + B_6\,Ms + Ui$$

Where:

Y = Income diversification

Ar = Age of respondent

Educ = Educational level of household head

Oa = Ownership of assets

Hs = Household size

Al = Access to loan

Ms = Marital status

ISSN-L: 2223-9553, ISSN: 2223-9944
Vol. 2, No. 2, March 2012

Ui = stochastic term.

It is expected that income diversification determinants such as educational level of household head, ownership of assets and age would have positive relationship with the dependent variable while access to loan, household size and marital status would have negative outcomes.

DATA PRESENTATION AND DISCUSSION OF FINDINGS

Table 1: Socioeconomic Characteristics of Farming Households

Socioeconomic Characteristics	Frequency	Percentage of Total
Gender		
Male	102	92.7
Female	8	**7.**3
Age		
Below 25	7	6.4
25 – 30	22	20
35 – 40	62	56.4
45 – 50	11	10
Above 50	8	7.3
Marital Status		
Married	73	66.4
Single	20	18.2
Divorced	7	6.4
Total	**110**	**100**
Household Size		
Below 5	32	29.1
5 – 10	56	50.9
11 – 15	12	10.9
Above 15	10	9.1
Educational Qualification		
Non-formal	42	38.2
Primary	34	30.9
Secondary	24	21.8
Tertiary	10	10
Farm Size		
Below 3 hectares	22	20
4-6	41	37.3
7-9	36	32.7
Above 9 hectares	11	10
Access to Loan		
Yes	38	34.5
No	72	65.5
Total	**110**	**100**

Source: Field Survey, 2010.

The study revealed that most respondents are males representing 92.7% while very few respondents are females 7.3%. This indicates that most men have the sole responsibility to carter for the family and female headed family are fewer proportional to the male headed families in the study area. This could be attributed to cultural and religion affiliation. The age distribution of respondents is presented in table 1 above shows that most respondents belong to 35-40 age group while very few are of above 50 years representing 62% and 8% respectively. This implies that diversification of income is common among the young household heads who are more energetic and could afford to take the risks associated with income diversification. The study also revealed that most respondents are married (66.4) while 6.4% are divorced. The household with 5-10 members ranked highest with 50.9% while household

ISSN-L: 2223-9553, ISSN: 2223-9944
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with more than 15 members ranked lowest with 9.1%. It is obvious that households whose membership is large easily diversify her income due to readily available family labour than those with few members. Child labour is particularly predominant in the study area indicating some level of poverty.

Most respondents had non-formal education accounting for 38.2%, 30.9% had primary education and only 10% had tertiary education. It is therefore noteworthy that educational level is low among the farming households which undoubtedly affect their income diversification patterns. The study also revealed that households have varying farm sizes which indicate that 37.3% had 4-6 hectares while 10% which is the lowest had above 9 hectares. This implies that most respondents are subsistence farmers and diversification of income will of course help raise their standard of living above poverty level. In the above, access to loan were differently specified by the respondents. The assertions made indicate that most respondents in the target population have no access to loan. The above table implies that thirty-eight (38) of the respondents have access to loan, while seventy-two (72) of the respondents have no access to loan. This could be attributed to respondents' level of education and the subsistence nature of farming.

Table 2: Households' income diversification sources.

Diversification Sources	Frequency	Percentage of Total
Petty trading	47	42.7
Matting	28	25.5
Tailoring	21	19.1
Barbing	18	16.4
Telecom Services	16	16.3
Construction	12	10.9

SOURCE: FIELD SURVEY, 2010.

Multiple responses existed as only 110 respondents were studied.

It was revealed in table 2 that the major income diversification sources in the study area are petty trading (42.7%), matting (25.5%), and tailoring (19.1%). Other diversification sources include barbing (16.4%), telecom services (16.3%) and constructions (10.9%). These income diversification sources are quite revealing and informative. Respondents are mostly farmers who engage in farming during the rainy season and are of the opinion that they engage in these income diversification sources mostly in the dry season. It is noteworthy that if respondent have access to loan and other credit services, their income diversification patterns are sufficiently dependable to generate more income and subsequently alleviate poverty.

Table 3: Regression Analysis

Variable	Unstandardised Coefficient			
	B	Std Error	T	Sign.
(Constants)	12781.640	1816.394	7.037	.000
Age	.327	.079	4.135	.000

ISSN-L: 2223-9553, ISSN: 2223-9944
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Educational level	25.244	24.074	1.049	.305
Assets	721.623	351.591	2.287	.032
Household size	-664.608	273.143	-2.433	.023
Access to loan	-.058	.058	-1.002	.327
Marital status	-200.770	325.375	-.617	.543

Significance at 5% level

The fundamental objectives of the regression is to determine how the explanatory variables (age, educational level, household size, assets, access to loan, and marital status) determine income diversification in Kunduga Local Government in Borno State and ascertain the population of variation in diversification that is explained or captured by these variables. The fulfillment of these objectives is justified by the regression equation:

Y = 1278.640 + .327Hc + 25.244Ar + 721.623Oa- 664.608Hs - .058Al -200.70Ms + ui

t-value (7.037) (4.14) (1.05) (2.28) (-2.43) (-1) (-.62).

R^2 = .924, R= .961, Adjusted R^2 = .904 and Dubin-Watson = 2.114

The empirical result of this study is startling and forcefully persuasive in general. The empirical result is both consistent and inconsistent with the theoretical postulations of the model. The coefficient of multiple determination of .924 indicates that about 92% of the variation in the income diversification in the study area has been captured by the model. This clearly shows that the model is very strong, reliable and has high predictive ability. The implication of this outcome is that 92% of income diversification is induce/caused by the explanatory variables. The multiple correlation coefficient of .961 also indicates strong positive relationship between the variables. Furthermore, the adjusted R^2 of .904 which is significant has further consolidated the goodness of the model, hence, its econometric significant and reliability. The coefficients on explanatory variables household consumption, age and ownership of asset conformed to the expected outcome and are statistically significant. The F-statistic is significant and Dubin Watson statistic reveals a minimal autocorrelation of random variables implies little fall in the efficiency of the econometric model.

On the contrary, some coefficient on the explanatory variable such household size, access to loan and martial status are inconsistent with the theoretical postulations and are having signs that are not expected. These coefficients have t-value that is statistically insignificant at 0.05 level of significant. This of course may be due to the unreliability of income diversification data for that period rather than to short comings inherent in the model. Nevertheless, the fact that this equation does not fit well for the targeted area calls for caution in the interpretation of the result reported but the model cannot obviously be out rightly discarded.

CONCLUSION AND RECOMMENDATIONS

Diversification of assets, activities, and incomes is important to African rural households in that diversification into off-farm income contributes a reasonable percentage to households' income. The empirical analysis confirmed the relevance of the alternative (off-farm) income sources and the effect of marginal changes in the explanatory variables on income diversification in the study area. Although respondents are primarily farming households, they also engage mostly in off-farm activities such as petty trading, matting and tailoring. The regression analysis revealed that diversification of income is determined by age, educational level and assets.

Based on the findings, it is therefore recommended that:

the presence of agricultural development institutions in rural areas that would promote access to credit facilities and ultimately increase income should be considered.

to enhance income diversification, it is important to improve rural infrastructure in terms of provision of electricity and improving access to markets.

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