



## Analysis of Income Determinants among Farm Households in Kaduna State, Nigeria

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### Abstract

#### Keywords:

Income,  
Determinants,  
Household,  
On-Farm

The study was conducted to analyze the income determinants among farm households in Kaduna state, Nigeria. One hundred and twenty (120) respondents were administered questionnaires selected using simple random sampling. Data were analyzed using descriptive statistics like frequency distribution, percentages, mean and inferential statistics like multiple regressions. Results from the analysis revealed that, the respondents were in their productive age, (46 years), mostly males (60%), highly educated, married (50%) with average family size of 7 persons. The analysis also documented that 38% of the respondents earned their income from off-farm activities with an average annual income of N188, 466.50. The major factors that influence income determination were marital status, household size, farm size and credit as these have coefficients that were significant at 1%, 5%, 5% and 1% levels respectively with a high  $R^2$  value of .86. The study concluded that on-farm income is the most important source of income for rural household and recommend that on-farm and non-farm economic activities should be promoted among rural households income improvement. The need for farmers to form cooperative society is important as access to credit significantly influenced income of farmers, this will also enable them to increase their farm size.

### 1. Introduction

Poverty reduction is often a key goal of economic development programming pursued by international development agencies as well as national government. This focus on poverty can be seen through international initiatives such as the United Nation's Millennium Development Goals which aim to halve the population of world population suffering from extreme poverty (defined as earning less than \$1/day between the years 1990 and 2015 (Millennium Development goal, 2015).

While the world as a whole is on track to meet this goal, much of this success is due to drastic reduction in poverty levels in East Asia. Rural households in developing countries have for a long time been perceived as farm households and that they receive their income predominantly from agriculture. Non-farm income is known to have been a significant source of employment for rural people. As noted by Nager and Naude (2014) rural non-farm activities constitute a significant proportion of rural

employment, and income from this source accounts for 35-50% of total rural household income across the developing world.

Due to the limited successes in sub-Saharan Africa, researchers and policy makers need to consider what types of household livelihood strategies and income activities have the greatest potential to serve as a motor to economic growth, reducing poverty while improving income distribution in the region (Nager and Naude, 2014).

Over two thirds of the world's poorest people are located in rural areas and are engaged in subsistence agriculture (Todaro and Smith, 2015). As noted by Binswanger-Mkhize et al, (2010) the relative reduction of the importance of agriculture and the expansion in rural non-farm (RNF) activities and income determination are likely features of the process of economic development. Growth in rural non-farm (RNF) activities cannot be seen in isolation from agriculture as both are linked through investment, production and consumption.

Rural households in developing countries have for a long time been perceived as farm households, and that they receive their income predominantly from agriculture. However, evidence abounds that rural households do not only receive a significant proportion of their incomes from non-farm sources, but also it is a significant source of employment for rural people. For instance, Haggblade et al, (2010) reported that rural non-farm activities constitute a significant proportion of rural employment, and income from this source accounts for 35 – 50% of total rural household income across the developing world. Haggblade et al, (2010) pointed out that rural households make up their livelihood based on complex strategies and not just on agricultural production. The livelihood of rural households is the result of the interaction between complex strategies and multiple income generating activities (Kilic et al, 2009). As a result, farm households in rural areas participate in multiple economic activities and thus diversify income sources to minimize agriculture related problems. In view of this, non-farm and off farm activities have recently become one of the main income determination strategies widely practiced by most farmers in developing countries. The importance of non-farm and off farm activities as source of income, employment, expansion of farm activities and way out of poverty among rural farm households in most developing countries is well recognized (Bernardin, 2012 and Benedito et al, 2011).

According to Start (2001) as cited by Alobo and Bignebe (2017) income diversification generally refers to income strategies of rural households involving an increase in the number of economic activities, regardless of the sector or location. As noted by Alobo and Bignebe, (2017), the income strategies may involve diversification of farm activities only, combining both farm and nonfarm activities and completely diversifying out of farming.

Many studies have attempted to shed light on income diversification and why income diversification by small scale farmers and households. Some of these studies on this effect include: Pattern and Determinants of Household Income Diversification in Rural Senegal and Kenya (Alobo and Bignebe, 2017). Assessing Determinants of Income of Rural Households in Bangladesh (Dayal, 2014). Analysis of Income Determinants among Rural Households in Kwara, State Nigeria (Fadipe et al 2014). However, there is little or none of such study in Kaduna, state Nigeria, thus the gap the research is intended to fill. The objectives of the study include: describe the socio-economic characteristics of the respondents and to analyze the factors that influence income diversification.

## 2. Materials and methods

### 2.1 The Study Area

The study area is Kaduna state, Nigeria. Kaduna state has three (3) Agricultural zones namely: Northern Agricultural Zone, Central Agricultural Zone and Southern Agricultural Zone. The state is made up of twenty three (23) LGAs. The state lies between latitudes 11° 32 and 09° 02 North of the equator and longitudes 8° 50 and 06° 15 east of the meridian. It shares common borders with Abuja in the South West, Katsina and Kano to the North-West, Nasarawa and Plateau in the South-East, Niger to the South-West and Bauchi to the North- East. The vegetation is divided into the Northern Guinea Savanna in the North and Southern Guinea Savanna in the South. The soils are a mixture of fine sand and clay which have been described as sandy loam in nature. The climate varies from the Northern to the Southern parts of the state. The mean annual temperature varies between 24°C -27°C. The wet season is usually from April to October with great variation as you move northwards. It is very much heavier in the Southern part of the state like Kafanchan, which has an average rainfall of over 1524mm than in the extreme Northern part around Ikara with an average rainfall of about 1016mm. On the average the state enjoys a raining season of about five months (Kaduna State Statistical Year Book, 2001).

A multi stage random household survey was conducted across the five (5) chiefdoms. Two (2) districts were purposively selected being the areas with farming households that have myriads opportunity to other ancillary jobs in their surroundings. Two villages from each of the district were through simple random sampling selected to sum up a total of 20 villages. Then, from the 20 villages, 6 households were then selected at the proportional allocation of 10% to give a total of 120 respondents for the study.

### 2.2 Methods of Data Analysis

The data for this study were analyzed using simple descriptive statistics such as frequency, percentage and mean and inferential statistics such as multiple regression analysis was used. The determinants of factors causing income diversity can be estimated using Standard Ordinary Least Square Estimation. This is as specified below.

$$D = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \mu$$

Where D= Income of household head (N)

$X_i$ = Exogenous variables that influence income determination

$X_1$ = Age of household head (years)

$X_2$ = Household size (number)

$X_3$ = Education of household head (number of years in school)

X4=Marital status of household head (married or single)

X5=Farm size of household head (Ha)

X6= Access to credit (Access=1, Non access=0)

$\mu$ =Error term

### 3. Results and discussion

#### 3.1 Socio-Economic Characteristics of the Respondents

##### Respondents

The results of the analysis as presented in Table 1 indicate that the mean age of the respondents in the study area was 46 years. This is an active and productive age group as there will be able to diversify income. This is in line with the findings of Awoniyi and Salman (2012) they noted that majority of the households that are engaged in non-farm income are still in their productive years. They are able to engage themselves in multiple income generating activities that could enhance the households' purchasing power and consequently their welfare status. As shown in Table 1 the highest percentage of respondent age category was 30 years and above which represent 60%.

Table 1 also showed that most (60.0%) of the respondents surveyed were males, while 40% represent females. The result of the analysis showed that male households (60.0%) dominate in the study area. This may be attributed to land ownership system that prevails in the area, which allows only male members of the society to inherit land as a factor of production. So the male dominance was probably due to their accessed to farmlands as well as positions occupied as heads of families which gives them unlimited access to income generation than the females.

This result further indicated that males are usually household heads and actively involved in agricultural and economic activities. Therefore, this revalidates the age-long dominance of men in agriculture. Gyanden et al, (2017) noted that in African culture, males folks have more access to land than women folks because of certain tradition which forbids owing of land by women. Further analysis from table 2 revealed that 62.5% of the respondents were married, compared to single (37.5%) With the majority of the farmers married in the study area, this result indicated that responding farmers are responsible as marriage comes with responsibility. This result is in line with the findings of Abiodun et al, (2014) they reported that majority of farmers (61.7%) in Oyo State of Nigeria were married. There is a tendency for income diversification as with much responsibility, the household heads will have to look for alternative sources of income to augment what they have. As noted by Adebayo et al, (2012) the purpose of income diversification is to increase the

non-farm income which is associated with higher level of consumption expenditure of a household.

That most respondents are married implies that they have to probably engage in enterprises with quick returns for the upkeep of their families and sufficient labour to work on their farms. This is in consonance with the findings of Olubunmi et al, (2017) they noted that marital status has significant influence on income diversification and they married will engage more on income generating activities.

The analysis from table 1 also revealed that 87.5 % of the respondents have one form of the education or the other. This will enhance income diversification. As noted by Adebayo et al, (2012) the more educated a household is, the more likely such a household will diversify income. Education will provide the needed skills and knowledge to help in income diversification. Awoniyi and Salman (2012) have noted that farmers may find it convenient to adopt modern improved techniques of production or operations because of their unlimited access to education as education will enhances the technical competence and entrepreneurial spirit.

From the results in table 1, the average household size was 7 persons which is quiet large. Which mean much mouth to feed, the household will engage in income diversification. Supporting this, Adebayo et al, (2012) have noted a significant relationship between household size and income diversification. Also Shehu (2017) had noted that large household size has implications on food security of the households and therefore household with large household size will tend to embark on income diversification to cater for the food needs, education and health of the family members.

From the results in Table 1 the average farm size was 1.8 hectares, only about 29.9% of the respondents have farm size of above 3 hectares. This buttress the need to diversify farm income to other non-farm activities as income from the farm will not be enough to cater for the family needs. Adebayo et al, (2012) have noted that the small the farm size, the more the tendency to diversify income. From the analysis on Table 1, the mean annual farm income of the respondents was N188,466.50. This indicates that households in the study area earn an average monthly income of N15, 711,79 indicating low income earning. The results further revealed that household in the study area earned N523.73 per day which is below the poverty line of US \$1.00 per day at N360 per Dollar. Obadan, (2016) had noticed an embarrassing paradox of poverty in the midst of plenty in Nigeria.

Table 1. Socio-Economic Characteristics Of The Respondents N=120

Variables	Frequency	Percentage	Mean
Ages (years)			
≥19	06	5.0	
20 – 24	17	14.2	
25 – 29	25	20.8	46
30& above	72	60.0	
Gender			
Male	72	60.0	
Female	48	40.0	
Marital status			
Single	45	37.5	
Married	60	50.0	
Divorced	13	10.8	
Widowed	02	1.7	
Household size (number)			
1 – 5	52	43.3	
6 – 10	41	34.2	7
11 – 15	16	13.3	
16& above	11	9.2	
Education (years)			
Primary	02	1.7	
Secondary	13	10.8	
Tertiary	90	75.0	
Non-formal	15	12.5	
Farm size (hectares)			
0.5 – 2.0	54	45.0	
2.5 – 3.0	30	25.0	
3.5 – 4.0	16	13.3	1.8
□ 4.0	20	16.6	
Annual Farm Income (N)			
50,000 – 100,000	15	12.5	
100,001 – 150,000	22	18.3	
150,001 – 200,000	04	03.3	
200,001 – 250,000	21	17.5	188,465.50
250,001 – 300,000	13	10.8	
300,001 – 350,000	30	25.0	
<350,000	15	12.5	

Source: Field Survey, 2018.

More so a mean household size of 7 persons in the study area lives on N87.3 per day indicating a poor living condition of the households. This supports the need for income diversification in the study area. The high level of education (87.5%) does not translate to anything to help in poverty reduction. This is an implication for extension agents in the state

to help the respondents in enlighten them on how to engage in income diversification activities to reduce poverty in the study area.

### 3.2 Determinants of Off-Farm Activities Among Respondents in the Study Area.

The significance of the power to effect changes in income in the study area among the respondents was shown using the multiple regression model. The determinants of income diversification by households were identified. Six variables namely, age, household size, education, marital status, farm size and access to credit were fitted. The results as shown in table 2 indicated that four variables; marital status, household size, farm size and access to credit were the significant and important variables that affect income diversification, as these have coefficients that were significant at 5%, 1%, 5% and 1 % level of probability. The overall F-statistics value of 109.781 was highly significant at 1% level which is an indication that the fitted variables are responsible for income determination in the study area. Specifically the coefficient of marital status is positive and significant at 5% level of probability meaning that the married are likely to engage in income diversification. As noted by Olubunmi et al, (2017) marital status increases the probability of being poor. This means that being married would increase the chance of being poor. Marriage come with additional responsibilities and therefore the married are more likely to engage in income diversification activities more than the unmarried. Further analysis from Table 2 indicate that the coefficient of farm size is negative and highly significant at 1% level, implying that the more the farm size, the less the tendency to diversify income. This could be attributed to the fact that the household may cultivate more hectares of farm land to yield more income and there will be no need to diversify. Respondents that are mainly farmers and do not have much land are expected to engage in other non-farm activities to augment their income. Adebayo et al, (2012) have notice an inverse relationship between income diversification and farm size. From Table 2, the coefficient of access to credit is negative and significant at 1% implying that if farmers have access to credit they may probably not engage in other non-farm activities that will bring more income. From this analysis, the coefficient of household size is positive and significant at 1% level, implying that the more the number of persons the higher the tendency toward income diversification. More number of persons means more responsibility therefore; the household head has to look for a way of catering for them. This is in line with the work of Gyanden et al, (2017) they noted that families with large number have more responsibilities.

Table 2. Determination Of Off-Farm Activities Of Respondents

Variables	Coefficients	Std Error	beta T-test	Sign
Age	0.104	0.046	1.099	0.274
Household size	0.380	0.054	3.200	0.002***
Education	0.078	0.042	1.470	0.144
Marital status	-0.209	0.057	-2.396	0.018**
Farm size	0.253	0.047	2.102	0.038**
Access to credit	-1.533	0.027	-11.964	0.000***
Constant	1.244	0.117	10.586	0.000***

F=109.781 R2=.873 R-2=.865

\*\*\*, \*\* Significant at 1%, and 5% level respectively

#### 4. Conclusion and Recommendations

Income diversification is the most important mean of earning income by rural households in the study area. The study observed that majority of the respondents, married, educated, of productive age and with large family size engaged in non-farm activities to earned income to support their farming activities with an average household earning of N188,466.50 per annum. The exogenous variables that are income diversification determinants were marital status, household size, farm size and access to credit. These were all significant with high R-2 value of 0.86. The study recommends that On-farm and non-farm economic activities should be promoted among rural households to accelerate income improvement. Government should invest more in education and training in rural areas to equip young people with the knowledge and skill to secure good livelihoods to alleviate poverty. Farmers are encouraged to form cooperatives in order to have access to credit to enabled income diversification.

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