



Faculty of Bioscience Engineering

Academic year 2014 – 2015

Determinants and impacts of off-farm participation and support systems on the overall income of the rural farmers: A case study of Umuawa, Abia State, Nigeria

OGBONNA CHINWE, A.

Promoter: Prof. dr. ir. Marijke D'Haese

Tutor: Lotte Staelens

Master's dissertation submitted in partial fulfillment of the requirements for the degree of Master of Science in Nutrition and Rural Development

Main Subject: Rural Economics and Management

Copyright

“All rights reserved. The author and the promoters permit the use of this Master’s Dissertation for consulting purposes and copying of parts for personal use. However, any other use fall under the limitations of copyright regulations, particularly the stringent obligation to explicitly mention the source when citing parts out of this Master’s dissertation.”

Ghent University, June, 2015

Promoter

Prof. dr. ir. Marijke D’Haese

Tutor

Lotte Staelens

.....

.....

The Author

Ogbonna Chinwe, A.

.....

Dedication

To my parents Sir and Lady C. O. Ogbonna and my brother Engr. Kingsley C. Ogbonna.

Acknowledgement

I would want to thank the Almighty God for his grace and guidance.

First I want to extend my profound thanks to my promoter; Prof. dr. ir. Marijke D’Haese for her encouragement and guidance. Her professional advice and suggestions were the backdrop that motivated me to overcome this study. I would like to thank my tutor; Lotte Staelens for her positive contribution, professional advice and suggestions, and readiness in giving me required assistance during this Master dissertation.

My gratitude goes to the Nutrition and Rural Development Program Coordinator and Assistant; Mrs. ir A. M. Remaut- De Winter and Marian Mareen for your consistent academic guidance through my Masters studies.

To my parents Sir and Lady C. O. Ogbonna, and my siblings Mrs. Chinyere Amanze, Engr. Kenneth Ogbonna, Engr. Kingsley Ogbonna, Mr. Martins Ogbonna, Dr. Mrs. Ngozi Ugorji for their prayers, financial support, advice and encouragement through my Masters studies. And not forgetting Hon. Israel Amanze, Mr. Chinonye P. Ugorji, Mrs. Kelechi Ogbonna, Mrs. Chinenye Ogbonna and Dr. Mrs. Daisy Ogbonna for their encouragement and support.

Finally, I wish to express my sincere thanks to everyone who gave me the desired assistance that saw me through the planning, development and production of this master’s thesis. My friends Stephen Chigbo, Innocent Ufomba, Temitayo Oluboyede and Mary Swiri Suh, and my course mates. You are all wonderful.

Chinwe Ogbonna, A.

Ghent, June 2015.

ABSTRACT

Farming as a principal source of income has failed to assure sufficient livelihood for most rural farming households in developing countries, especially in Sub-Saharan Africa. Hence, diversification into off-farm activities has become a surviving strategy for most rural farm households. Using survey data from Umuawa - Abia State, Nigeria, this paper examines the determinants and impacts of off-farm participation and government support systems on the overall income of rural farmers. The results indicate that households with off-farm activities have higher overall income than households with a single source of income. This implies that those that engage in off-farm activities are more likely to meet their household needs, are more capable to withstand shocks (for example, crop failure) and have a more stable livelihood than those that have farming as a single source of their income. Farm labourer (agricultural wage employment) was the dominant source of off-farm income. Age and gender of the household head were significant determinants of off-farm participation. In addition, the results showed that current agricultural support (provision of subsidized fertilizer and seeds) in the study region did not have any effect on households farm income. Gender of the household head and farm size cultivated however, were found to be significant determinants of farm income. This paper ends with important policy implications that suggest how current shortcomings related to agricultural support can be overcome, how to give more attention to off-farm activities and how to reduce gender imbalances at the level of off-farm participation and farm income.

Keywords: Farm, off-farm, income, diversification, livelihood of rural farmers, agricultural support

Table of contents

CHAPTER 1 INTRODUCTION	1
CHAPTER 2 LITERATURE REVIEW	3
2.1 The concept of income diversification	3
2.2 Determinants of off-farm participation	4
2.3 Reasons and Impacts of off-farm participation	8
2.3.1 Reasons for off-farm diversification.....	8
2.3.2 Impacts of off-farm participation	9
2.4 Effects of agricultural support.....	11
2.4.1 Input subsidies (fertilizer and seeds)	11
2.4.2 Other determinants of farm income/ productivity	14
2.4.2.1 Access to land	14
2.4.2.2 Gender.....	15
2.4.2.3 Livestock holdings	16
CHAPTER 3 CASE	18
3.1 Historical background of agricultural sector in Nigeria.....	18
3.2 Study area.....	20
CHAPTER 4 METHODOLOGY	22
4.1 Data collection.....	22
4.2 Data analysis	22
4.2.1 Descriptive statistics	22
4.2.1.1 Household socio-demographic factors.....	22
4.2.1.2 Structure of household incomes.....	23
4.2.2 Analysis	24
4.2.2.1 Determinants of off-farm participation.....	24

4.2.2.2	Impacts of off-farm participation on the overall income of the farm households	25
4.2.2.3	Effects of agricultural support on the farm income of the farm households	25
CHAPTER 5	RESULTS	26
5.1	Descriptive statistics.....	26
5.1.1	Households socio-demographic characteristics.....	26
5.1.2	Households Farm activities	26
5.1.3	Households off-farm activities	29
5.1.4	Information on households livelihoods	31
5.1.5	Structure of household incomes	32
5.2	Analysis.....	33
5.2.1	Determinants of households off-farm participation.....	33
5.2.2	Impacts of off-farm activities on the overall income of the households	34
5.2.3	Effects of agricultural support on households farm income.....	35
CHAPTER 6	DISCUSSION OF RESULTS	37
6.1	Discussion on descriptive statistics	37
6.1.1	Households socio-demographic characteristics.....	37
6.1.2	Household farm activities.....	37
6.1.3	Households off-farm activities	38
6.1.4	Households livelihoods.....	39
6.1.5	The structure of household incomes.....	39
6.2	Discussion on Analysis	40
6.2.1	The determinants of households off-farm participation	40
6.2.2	Impacts of off-farm participation on the overall income of the households	42
6.2.3	Discussion on effects of agricultural support on household farm income	43
CHAPTER 7	CONCLUSION.....	45

7.1 Conclusion..... 45

7.2 Study limitations 46

7.3 Suggestions for future research..... 46

7.4 Policy recommendations 46

List of Tables

Table 1 Analysis of households socio-demographic characteristics.....	23
Table 2 Analysis of the composition of household incomes	24
Table 3 Result on household socio-demographic characteristics	28
Table 4 Summary statistics	28
Table 5 Farm households agricultural support and other sources of income	29
Table 6 Farm households food consumption pattern.....	32
Table 7 Results on composition of average household incomes	33
Table 8 Determinants of households off-farm participation.....	34
Table 9 Analysis of the difference between the overall income of the two groups (households in off-farm and households not in off-farm)	35
Table 10 Effects of agricultural support on households farm income	36
Table 11 Summary Result research Question 1 (determinants of off-farm participation)	42
Table 12 Summary Result Research Question 2 (Impact of off-farm participation on households overall)	42
Table 13 Summary Result Research Question 3 (Effect of agricultural support on farm income)	44

List of Figures

Figure 1 Determinants of off-farm participation (research question 1).....	7
Figure 2 Impact of off-farm participation on households' overall income (research question 2).....	11
Figure 3 Effects of agricultural support on households' farm income (research question 3).....	16
Figure 4 Different kinds of off-farm activities engaged by farm households.....	30
Figure 5 Months farm households engage in off-farm activities.....	30
Figure 6 Household's perception of the need to go into off-farm.....	31
Figure 7 Impacts of off-farm participation on the overall income of the households.....	35

CHAPTER 1 INTRODUCTION

For a long time, the perception was that farming households in developing countries exclusively engaged in farming activities. Because of this, policy makers largely focused on the agricultural sector, thereby neglecting the off-farm sector (Babatunde, 2013). Over the last three decades however, evidence has shown that small-holder farming households not only depend on agriculture but also often engage in other income generating activities of which off-farm activities appear to be very important (Barrett, Reardon and Webb, 2001).

Among rural farming households, off-farm activities have become an important component of their livelihood strategies (Babatunde and Qaim, 2009). Different studies (for example De Janvry and sadoulet, 2001; Haggblade, Hazell and Reardon, 2007) have shown that an increasing share of the total household income can be attributed to off-farm activities. Reasons for this income diversification given in literature are a declining income from the farm and the desire to avoid agricultural production risks to a large extent (Lanjouw, 1999). Households are pushed into off-farm activities when farming becomes less profitable and more risky as a result of rise in population and crop and market failures. However, households on the other hand can also be pulled into the off-farm sector, especially when they get higher income from off-farm or when off-farm is less risky than agriculture (Babatunde et al., 2009). In addition, due to rapidly increasing population in Africa, more pressure is exerted on arable lands. For this reason, many households are no longer able to depend only on agriculture but also need to engage in other income generating activities (Oseni and Winters, 2009).

Evidence about the contributions of off-farm activities to the overall income of the farming households in Nigeria is scarce. In addition, quite little policy efforts have been made so far to actively encourage off-farm sector/ activities in a pro-poor way and overcome potential constraints (Lanjouw and Lanjouw, 2001). This is especially true in countries situated in Sub-Saharan Africa. One reason is probably the scarcity of up-to-date and solid information about the drivers of household income diversification in clearly defined contexts (Babatunde et al., 2009). It is often unclear how and whether off-farm activities can contribute to equitable development. This calls for further research in order to understand the situation better in specific settings and provide relevant findings that are needed for appropriate policy responses.

In addition, a fast development in agriculture would serve as a facilitator on the improvement of peoples' living standards. For agriculture to develop, farmers access to crucial productive resources in order to increase productivity is important (Crawford, Jayne and Kelly, 2006). Different studies focus on the impacts of agricultural support on agricultural productivity (for example, Evanson and Gollin, 2003; Byerlee, Kelly, Kopicki and Morris, 2007). However, empirical evidence on the impacts of agricultural support on households farm income in Nigeria is scarce. It is also crucial to provide relevant findings, focusing on the effect of the agricultural support on households' farm income for the development of appropriate policy responses in order to develop agriculture.

The aim of this Master's Dissertation is to contribute to a better understanding of the determinants and impacts of off-farm income and agricultural support on the overall income of farm households in Umuawa, Abia State, Nigeria. Hence, our study results can help to identify the potential for off-farm engagement and agricultural support. This study has been undertaken in Umuawa village in the Abia State, in the South Eastern Part of Nigeria where we have collected 70 surveys at household level. In order to have a general in-depth knowledge about the relevance of off-farm participation to these farming households, we examine the determinants of households' participation and how it contributes to their overall income.

This paper achieves its objectives in three ways. First, we examine the determinants of household participation in off-farm activities. It is important to identify who diversifies to know the possible factors of entry and barrier to off-farm participation.

Second, we examine the impact of off-farm participation on households' overall income in order to examine if those households with a diverse portfolio of income sources are more secure than those who engage only in farming activities.

Third, we examine the effects of agricultural support on the farm income of the farm households. This is important in order to know if agricultural support has brought about the desired results in production and income of farmers. If agricultural support increases production and income, it is assumed that farm households welfare would be enhanced.

CHAPTER 2 LITERATURE REVIEW

This chapter reviews different concepts of income diversification and discusses the determinants of off-farm participation. It further reviews existing empirical evidences on reasons for diversification and its impacts. This chapter concludes by reviewing empirical evidences on different kinds of agricultural support on farming households from different perspectives and its various impacts.

2.1 The concept of income diversification

Diversification patterns vary depending on the definition that is used. Lower domestic marketing prices, rising income and international trade liberalization create new opportunities for rural farmers, thereby contributing to more diverse income sources in the rural areas. This however does not necessarily imply a diversification of income at the level of household (Isaac, 2009). In order to understand the reasons for an individual to have many activities that generate income, it is important to look at factors at the household-level.

One definition closest to the original meaning of “income diversification” perhaps, refers to the increase in the number of sources of income in a household or the balance among diverse sources. Thus, having two sources of income in a household shows more diversification than a household with just one source of income. Also, a household that has two sources of income, each contributing half to the total income, would be more diversified than a household with two sources of income, with one contributing 90% of the total income and the other only 10% (Ersado, 2003; Joshi, Gulati, Birthal and Twari, 2003).

According to Ellis (1998; 2000), we can differentiate between the following income sources:

Farm income: This refers to income generated from farming activities from one’s own farm, whether on owner’s occupied land or leased land. To define broadly, farm income includes crop output as well as the cash income generated from the sale of outputs and one’s own livestock consumption.

Off-farm income: Refers to temporary wage labour on other peoples’ farms within agriculture (Ellis, 1998:5). In most instances, this involves working on other peoples’ farms for wages, exchange of labour in kind or sharecropping. Thus in this paper, off-farm income refers to income generated outside working on own farm.

Non-farm income: This refers to income gotten from non-agricultural activities. The classification of income as non-farm involves making a sectorial distinction depending on the type of the activity (Barrett et al., 2001). Non-farm income however may also relate to a dimension that includes income obtained for example from remittances (Ellis, 1998).

To go further to the meaning of livelihood diversification, rural livelihood diversification is referred to a process whereby households build up and combine an increasing diverse portfolio of income generating activities and assets for survival and improvement of their living standards. Thus, diversification involves the maintenance and steady modifications to a high-varied range of activities and occupations (Ellis, 2000). Diversification has been regarded as a risks minimizing strategy when faced with rising climatic conditions and economic risks in developing countries (Zerihun, undated). Barrett et al. (2001) in his study indicated that diversification is mostly measured by using income earned from different activities of different sources, although assets and activities can also be used to measure diversification. Similarly, in this study, income and activities are used as an indicator of households livelihood diversification level since there is an intimate link between livelihood and income just as the structure and household income at a given time is the most measurable outcome of their livelihood process (Barrett et al., 2001). Besides, income proffers a clear interpretation of results because it comprises of both cash and in-kind contributions to the material welfare of the households, which is derived from diverse livelihood activities in which the household engage in. Income from crops, livestock, rents, wages and remittances among others, are the components of income. The consumption of own farm produce, payments in-kind and exchange of food item between households are referred to as in-kind consumption of income (Ellis, 2000).

2.2 Determinants of off-farm participation

Off-farm income diversification as an agricultural investment is particularly important for poor farm households. For example, in rural Nigeria, although farming is the main source of livelihood, rural households often diversify from farm to off-farm activities (Oseni and Winter, 2009). Alimba (1995) observed some common off-farm economic activities in rural Nigeria. These included trading (trading of food items, fruits and vegetables, provision stores etc.), sewing, palm wine tapping, farm labourer, craft (leather works and weaving, making pots,

carpentry work, carving calabash and wood). Some other off-farm activities that are also gaining importance in rural Nigeria include car repairs, hair dressing salons and welding etc.

It has been observed by Ibekwe et al. (2010) that in Nigeria, non-farm income diversification among farming households was determined by the households demographic features and other household characteristics such as occupation, level of education, family size, size of land as well as farm output, however age of the household head was found not to have effect. Similar results were found by Babatunde et al. (2009) indicating that participation in off-farm employment is determined by household size, gender of the household head, age of the household head, education level of the household head, assets and infrastructural variables such as access to electricity, pipe-borne water and tarred road. He argued that larger households can maintain their farms and activities in the household, while sending one or two members of the household to work off-farm. He also pointed out that male headed households are more likely to participate in wage employment than female headed households because the latter are those of whom their husbands have passed way and so they will have to spend more time on farm and household chores to maintain a certain level of subsistence. Another striking finding of Babatunde et al. (2009) is that he found that land size is not a determinant of off-farm participation, implying that participation in off-farm is not primarily a response to land constraints. However, most studies have argued that shrinking per capita land availability is the primary reason why households go into off-farm activities (Matsumoto et al., 2006; Van den Berg and Kumbi, 2006).

Findings of the Multinomial Estimation Method where no participation in off-farm was the choice comparison, showed that education, availability of off-farm activities in the regions and ethnic groups were found to affect off-farm participation. It was argued that in the study area, education helped the farm households to participate in the higher paid off-farm activities (Beyene, 2008). Work by Corpal and Reardon (2001) also found that the effect of education on off-farm participation decision was different, depending on the type of off-farm activities. A study by Beyene (2008) on the determinants of off-farm participation decision in Ethiopia also indicated that age of the household head, health status of the male members of the household, training in handicraft skills by male members of the household, sex, presence of children had a significant effect on households off-farm participation decisions. He argued that at a younger age, the probability of working off-farm increased and also that farmers who were trained in non-

farm activities were more likely to engage in either wage employment such as masonry, carpentry, etc. or self-employment activities like weaving, carpentry, pottery, blacksmithing, etc. However, he stated that the education level of the household head had no significant effect on the participation decision of the farm households in off-farm activities and pointed out that the possible reason for this could be the nature of off-farm activity. He also confirmed that most of the off-farm activities especially wage employment, did not require any formal education. This argument was supported by Woldehanna (2000) and MOLSA (1997) in their different studies in Tigray and the Ethiopian case respectively.

Similar results on the determinants of off-farm diversification have also been obtained in other parts of African Countries. According to the studies of Awudu and Anna (2001) in Southern Mali, results indicated that the wealth of the household measured by its landholding had a large positive impact on its participation in both livestock-rearing and non-farm activities. Previous studies in Ethiopia suggest that the determinants of diversification vary according to household wealth and geography. For instance, Demisse and Workineh (2004) indicated that in the Southern Ethiopia ownership of assets, especially livestock, played a major role in influencing the decision of the household to diversify into non-farm activities. Furthermore, the authors also showed that quality and quantity of labour determined the choice of diversification by easing the barriers to enter into non-farm activities. However, land size, cash crop production and agricultural extension services did not seem to encourage diversification in Ethiopia (Demisse and Workineh, 2004).

Similarly, this research intends to find out whether it will obtain similar results as other authors on the determinants of off-farm participation. Therefore to answer our research question 1 (determinants of off-farm participation) we hypothesize as follows:

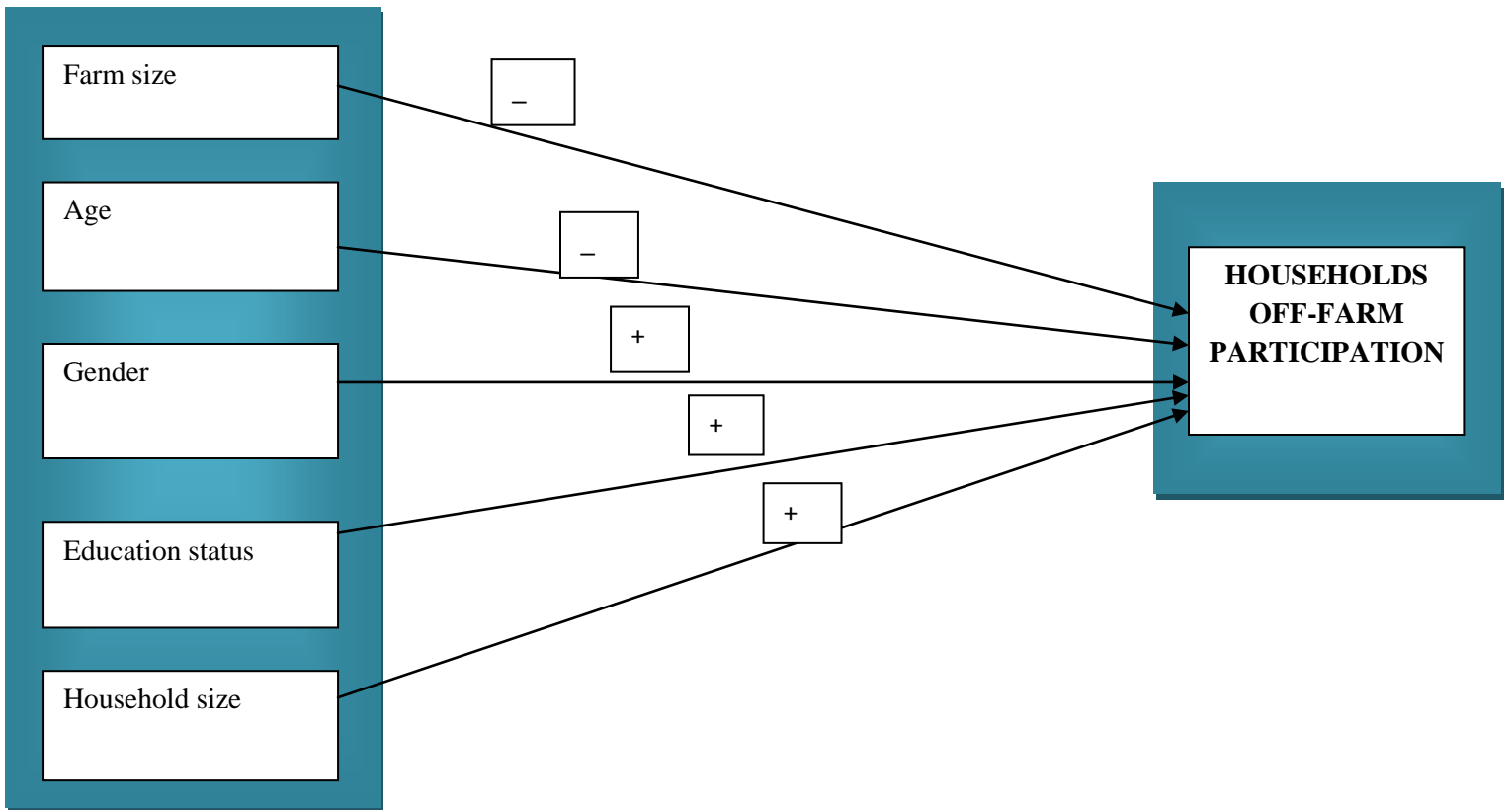


Figure 1 Determinants of off-farm participation (Research question 1)

We hypothesize that:

H₁ = The larger the farm size cultivated by the household, the less they will participate in off-farm activities.

H₂ = The older the household head become, the less he participates in off-farm activities.

H₃ = Male headed households are likely to participate more in off-farm activities than female headed households.

H₄ = The higher the educational level of the household, the more he will participate in off-farm activities.

H₅ = The larger the household size, the more they will participate in off-farm.

2.3 Reasons and Impacts of off-farm participation

2.3.1 Reasons for off-farm diversification

Diversification may occur deliberately as a household strategy (Stark, 1991 cited in Ellis, 2000) or as an involuntary response to crises or shocks (Ellis, 1998). Therefore, the consequences and causes of diversification can differ based on location, level of income assets, opportunity, social relations and institutions. As a result, diversification differs under distinct circumstances (Ellis, 2000).

Thus, push and pull factors are found to diversify livelihoods (Barrett et al., 2001). The push factor is a kind of diversification driven factor due to the fact that rural farmers have limited capacity to bear risks where there is incomplete or weak financial systems. This provides a strong incentives to create portfolio of activities so as to make consumption and income flow stable (Barett et al., 2001). Off-farm Income diversification may be driven by the following push factors: first, when a need arises to increase the income of the family when the income that is gotten from the farm is not enough to provide sufficient livelihood (Minot et al., 2006). Second, because of lack of insurance market, there arise a desire to manage agricultural production and market risks (Reardon, 1997; Barrett et al., 2001). Third, the need to get more money to put into agriculture when the credit market is not functioning well (Kilic et al., 2009; Oseni and Winter, 2009; Ruben and Van Den Berg, 2001).

The pull factor perspective is when the power source of growth in the local area such as commercial agriculture or nearness to an urban area create opportunities to diversify income in linkage activities of production and expenditure (Barett et al., 2001). The rural farm households can be pulled into off-farm sector because of higher returns of labour and also because investing in off-farm sector is much less riskier than agriculture (Kilic et al., 2009).

Declining income from the farm and the desire to insure against agricultural production risks and market risks are the reasons why household diversify their income (Kijima et al., 2006; Matsumoto et al., 2006). Households are pushed into off-arm activities leading to “distress push” diversification, when farming becomes less profitable and more risky as a result of rise in population and crop and market failures. However, households on the other hand are rather pulled into off farm sector, especially when they get higher income from off-farm or when off-farm is less risky than agriculture, resulting in “demand pull” diversification. While both effects

of demand pull and distress push have been recognized in principle (e.g., Reardon et al., 2001), from many studies, it is assumed implicitly that distress-push effects dominate. According to a study undertaken by Van den Berg and Kumbi (2006), it was indicated that diminishing availability of per capita land was always considered as the primary reason for increasing off-farm activities. However, a study undertaken by Babatunde et al. (2009) in Kwara State Nigeria, indicated that among the rural farmers the most limiting factor for enhancing farm productivity was not land, but that off-farm income significantly contributed to the overall total income. Therefore, his findings suggest that demand-pull effects were of great significance in this particular case.

The problems arising from seasonal nature of agricultural production are taken care of by farmers through these off-farm activities as labour, output and income are involved (Eboh, 2002; Eboh and Ocheoha, 2002; FMARD, 2000; Nwaru, 2005). Other reasons for livelihood diversification are poor access to credit and inadequate liquidity, these are the most pressing limitations to improved agricultural production among farm households in developing countries (Deininger, Savastano and Carletto, 2007; Haggblade et al., 2007).

2.3.2 Impacts of off-farm participation

Various studies in Africa have shown that while most rural households are involved in agricultural activities such as crop production, fish production or livestock as their main source of livelihood, they also engage in other income generating activities to make up their main income source. Majority of producers in the rural area have diversified their productive assets to surround a range of other areas of production. Very few of them in other words, gather their income from only one source, make use of their resources in one activity or hold all their wealth in the form of any single asset (Barrett et al., 2001).

In developing countries, it has been indicated that non-farm income accounts for between 35% and 50% of the total income of the rural farm households (Haggblade et al., 2010). Davis et al., (2007) approximately set the global figure at 58%, with some of the countries recording a share as high as 75% of the overall income on average. In rural Vietnam, Stampini and Davis (2009) studied the influence of off-farm employment on the use of variable input by rural farmers. The authors found out that there was a significant correlation between rural non-farm employment participation and more expenditure on seeds, hired labour, livestock input and agricultural

services. Pfeiffer et al. (2009) in their study on the impact of non-farm activities on agricultural production found out that there was a small efficiency gain of households that have access to off-farm income. Similar to the above results are what was found in four African countries: Malawi, Tanzania, Kenya, and Uganda, where Ellis and Freeman, (2004) examined the strategies for rural livelihood and poverty reduction using a comparison of means. The authors found out in their results that productivity increased sharply with off-farm income. The authors further stated that the income gotten from off-farm activities helped the households to hire labour and buy farm inputs.

Among the farm households in rural Ghana for instance, 74% were engaged in off-farm activities (Jolliffe, 2004). There was an increase in non-farm income as a share of total household income in rural Ghana from 35% in 1998 to 41% in 2006 (Senadza, 2011). In rural Ghana, Anriquez and Daidone (2010) examined the effects rural non-farm employment on farm diversification, production efficiency and input demand. Their result suggested that there is an increase in investment in most agricultural inputs due to expansion of the rural non-farm employment. The role of off-farm activities in rural households in Mexico was studied by De Janvry and Sadoulet (2001) and their result showed that off-farm participation helps to reduce poverty and contributes to a greater distribution of income equality. Kutengule (2000) reconfirmed the fact that non-farm activities growth for diversification of rural opportunities and income is a way forward to poverty reduction for rural Malawians who have persistent troubles of small and declining farm sizes.

Oseni and Winter (2009) used the 2003 Nigerian Living Standard Survey data to examine rural non-farm activities and crop production in Nigeria. Their results suggested that there was a positive and significant effect of participating in non-farm activities on crop expenses, particularly on payment for inorganic fertilizers and hired labour. Off-farm and non-farm incomes represent an important element in the livelihood of the rural poor household in Nigeria. In many areas, the population density and the depletion of natural resources continues to increase such that such that farming cannot possibly remain the only source of income. Haggblade (2005) indicated in his study that although most rural economies rely on agriculture, given the scale of non-farm incomes, the notion of rural economies depending on agriculture is clearly outdated. In

fact, studies have shown that own crop production is no longer the ultimate source of income for rural households.

Similarly, this research intends to confirm what literature has found on the impact of off-farm participation on households' overall income, which leads to their greater stability in their general livelihoods.

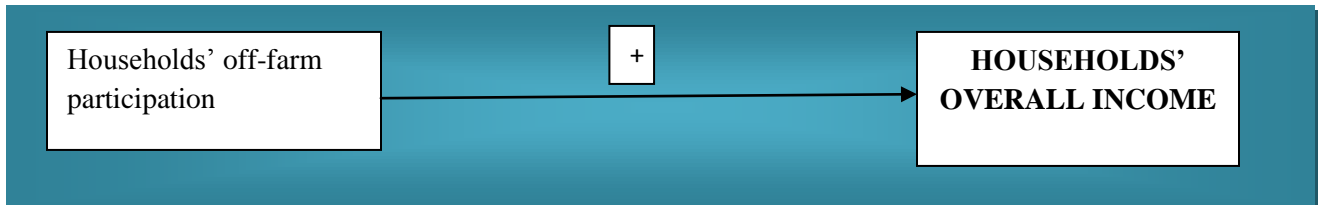


Figure 2 Impact of off-farm participation on households overall income (research question 2)

Therefore to determine the impacts of off-farm participation on households overall income (research question 2) we hypothesize that:

H_6 = Households that engage in off-farm will have more income than household that did not participate in off-farm.

2.4 Effects of agricultural support

A fast development in agriculture would serve as a facilitator on the improvement of peoples' living standards. For agriculture to develop, farmers access to crucial productive resources in order to increase productivity is important (Crawford, Jayne and Kelly, 2006).

2.4.1 Input subsidies (fertilizer and seeds)

Increasing interest in large scale input subsidies in agricultural development and food security policies in Africa have been seen in recent years. In the past, input subsidy have been of great importance in successful agriculture and broader developments, with the effective use of major grains to avoid market failures. Medium to long term investments in input subsidies are needed in order to increase the knowledge and capital of farmers, supply system and economic growth. In other words, agricultural input subsidies are not a short term quick fix (Andrew Dorward, 2009).

The use of modern inputs particularly that of improved seeds and fertilizers, have been widely recognized as closely linked to higher productivity and food security (Evanson and Gollin, 2003). It has been argued that the modern use of input brought about substantial differences in agricultural productivity and yields between Africa and Asia (Morris, Kelly, Kopicki and Byerlee, 2007). In India, evidence suggests that better access to infrastructure (e.g., roads), irrigation and agricultural services has provided Asian farmers significantly better access to modern inputs (Fan, Gulati and Thorat, 2008). In contrast, in Sub-Sahara Africa, most of the farmers have not exploited these benefits because they have been faced with the problems of inadequate infrastructure and lack of agricultural services (Crawford et al., 2003; Jayne, Govereh, Wanzala and Demeke, 2003).

Of all inputs that are used in agriculture, none has the ability to affect agricultural productivity more than improved seeds (Morris, Tripp and Dankyi, 1999). “Improved” may have the attribute of any of the below mentioned desirable characteristics. These include, responsiveness to other inputs like fertilizer, irrigation, higher potential yield, greater tolerance to droughts, infestation of pests and diseases, shorter length of growing season, durability after harvest when stored, higher nutritional content and better taste (Bola, Taiwo, Aliou and Vivian, 2011). Morris et al. (1999) further explained that if seed of improved varieties that perform well under local conditions are obtained and adopted by farmers, the efficiency of other inputs conversion into economically valuable outputs rises, thereby leading to increase in productivity. This result can increase farmers income, reduce food prices, increase consumption and thereby having a positive impact on poverty (Diagne, Adekambi, Simtowe and Biaou, 2009). According to studies undertaken by Bola et al. (2011) on the impact of the access to improved rice seeds on income of farmers in Nigeria, it was indicated that income from rice production and per capita households’ income in the entire population of the sampled farmers increased by 18.53 % and 2.60 % respectively. Meanwhile, the increase in the income from rice production and per capita household income (22.53% and 46.60 respectively) for the treated group was doubled more than that of the control group. The above result suggests that the use of improved seeds (good quality seeds) can indeed generate increase production yield which automatically results to increase in the income of the households.

Another important agricultural input is fertilizers. The improvement and maintenance of soil fertility is an important prerequisite for achieving sustained increases in crop yields. To determine soil fertility, it involves the combination of several factors including soil depth, texture, content of organic matter and replenishment of Nutrients (Speirs and Olsen, 1992). Nutrients nitrogen, phosphorous and potassium are the most important components of soil fertility. Without necessary nutrient levels, crop yields cannot increase nor yields be sustained overtime or respond to other inputs as new seeds and management practices without the level of soil fertility being adequate. Organic and inorganic fertilizer must be applied in order to achieve sufficient nutrient levels in most soils (Speirs et al., 1992). It has been widely recognized that the use of modern input such as fertilizers on farm crops is closely linked to higher productivity and reduction of poverty, and food security (Crawford et al., 2006; Evanson and Gollin, 2003).

The fertilizer and seed subsidy program initiated by the government of Malawi is one of notable successful stories which has been appraised for increasing the maize production of the country (Denning et al., 2009). Thus, it has been observed by Falusi (1989) that in savannah zones, fertilizers are very important because of the yearly bush burning which destroys the organic matter and makes the soil become poorer. However, Amalu (1998) noted that the constant increase in price of fertilizer is increasingly making it difficult for small scale farmers to buy the minimum 50kg bag of fertilizer. From a farmer point of view, to achieve higher production and in order to meet rising food demand and other agricultural products, fertilizer is needed. There has been a sharp increase in the use of fertilizer in Nigeria in recent years, but in spite of the increase, the use of fertilizer per hectare is still very low.

A study carried out by Esther, Michael and Jonathan (2008) on how high rates of return to fertilizer can be in Kenya, their result showed that undoubtedly, the use of fertilizer and seeds may result to increased yield but the return to fertilizer is thus sensitive to how it is used. They further pointed out that while fertilizer may be profitable when used correctly, that farmers may not have used the fertilizer and hybrid seeds in the region because the farmers did not adapt to the official recommendation. They further said that it is not necessarily easy to use correctly, which means that it may not be profitable for many farmers when not correctly applied. Andrew and Ephraim (2011) described the outcomes and impacts of the Malawi agricultural input subsidy programme (MAISP) from 2005/06 to 2008/09. They argued that increased crop

production results from increased input use (especially fertilizer and seeds), leading to increased agricultural yields, with the yields responses to these inputs depending on the weather and input use efficiency.

2.4.2 Other determinants of farm income/ productivity

2.4.2.1 Access to land

FAO and many others have (for example; Toulmin and Quan, 2000) argued that direct benefits can be derived by the poor by increased access to land, leading to direct benefits of poverty alleviation, thereby contributing to household food security. In a society that is dominated by rural people, where agriculture is the major occupation to make a living, access to land is a fundamental means by which these poor rural dwellers can ensure household food supplies and income generation. When land rights are secure, it serves a basis for shelter, a basis for access to services and a basis for people to participate in politics. It can provide also a source of financial security building collateral in order to raise credit, serve as a transferable asset that can be sold and/or rented out, mortgaged, loaned or give it out for free. Secure access to land motivates the user of the land to invest in labour and other resources in the land so as to sustain productivity and to maintain the value of that land (Julian, 2006).

Furthermore, women's access to land is of great significance for reducing poverty because they play an important role as food producers and broader role in social reproduction in both small holder farming economies. Female headed households, who represents a significant number of the poor can benefit largely from this security, status and opportunities of earning income which security of access to a plot of land can give. The control of land assets by women not only enhances their welfare and earnings capacity but also tend to increase the expenditure on food, children's health and education. Women's control over land has a strong potential effect on the welfare of the next generation and human capital accumulation rate (Julian, 2006). The relevance and significant of women in food production therefore cannot be overemphasized (Rahman, 2008). Findings showed that women make up 60 to 80% of agricultural labour force in Nigeria (World Bank, 2003) depending on the region and they produce two-thirds of food crops.

However, the inverse relationship between farm size and productivity is a crucial nonrealistic fact which forms the basis of development policies and arguments for redistributive and reforms

(e.g. Lipton, 1996). The basis of inverse relationship between productivity and farm size that is most widely recognized is that small farmers use more labour per hectare and therefore produce more total output per hectare per annum (Lipton, 1993: 645) as a result of large farms changing labour supply balance from the use of family to hired labour, with increasing reduction of family supervision. However, Andrew (1999) investigated the relationship between farm size and productivity among smallholder farmers in Malawi. His result of regression analysis on net output per hectare for different holding size categories across Malawi showed that there was a positive relationship between productivity and farm size. In Central Mzimba, regression estimates also gave a significant relationship between agricultural productivity and farm size. He concluded by saying that his analysis support the hypothesis of a positive relationship between size of farm and agricultural productivity in labour scarce areas in Malawi and in the whole country of Malawi.

2.4.2.2 Gender

There have been several studies on the differences in technical efficiency between males and females, which have found insignificant dummies for the sex of the household head or sex of the farm manager. A study undertaken in Kenya by Agnes (1996) showed that there was no difference in the technical efficiency between male and female household heads meaning that female farmers are equally as efficient as male farmers, once individual characteristics and input levels are controlled for. Women's roles in domestic activities are also attributes to their lower productivity in agriculture. In most rural cultures, women have a greater responsibility of taking care of the children which are enforced through cultural norms. This may affect women's participation in agricultural demands which conflicts with household responsibilities. Bindlish and Evenson (1993) on evaluating the effect of training and visit (T&V) extension system in Kenya found that male heads are equally as efficient as female heads. An interesting contrast result was found in Burkina Faso (Bindlish, Evenson and Gbetibouo, 1993). Their regression results showed that female household heads were less productive than men in most crops, and had total value of output of about 15% than lower. According to the findings of a study undertaken by Ali, Erenstein and Rahut (2014) on gender contribution in production of high value crops in Pakistan, women's participation in farming activities had a positive and significant impact on household welfare. They further concluded that without female participation, the production of high value crops were not possible in Pakistan and may result in decrease of

household income. However, women’s participation in farming could increase the household income as much as 2000-2400 rupees.

2.4.2.3 Livestock holdings

Research in Ethiopia, while examining the contribution of livestock to farm income showed that a significant proportion of farm cash incomes originated from trade in animals and sales of livestock products which accounted for 56% and 31% of the farm cash income respectively (Jutzi et al., 1988). They further pointed out that farmers considered livestock as more reliable store of wealth than other alternatives (such as bank deposits) and as an investment that can be easily turned into cash. They concluded by saying that livestock make a reasonable contribution to the economy of smallholder farmers in the highlands of the Central Ethiopia.

To summarize, this study also wants to find out the impacts of agricultural support (fertilizer and seeds) on farm income of the households (research question 3), putting gender of the household head, farm size of the household and livestock holdings as control variables and made the following hypotheses.

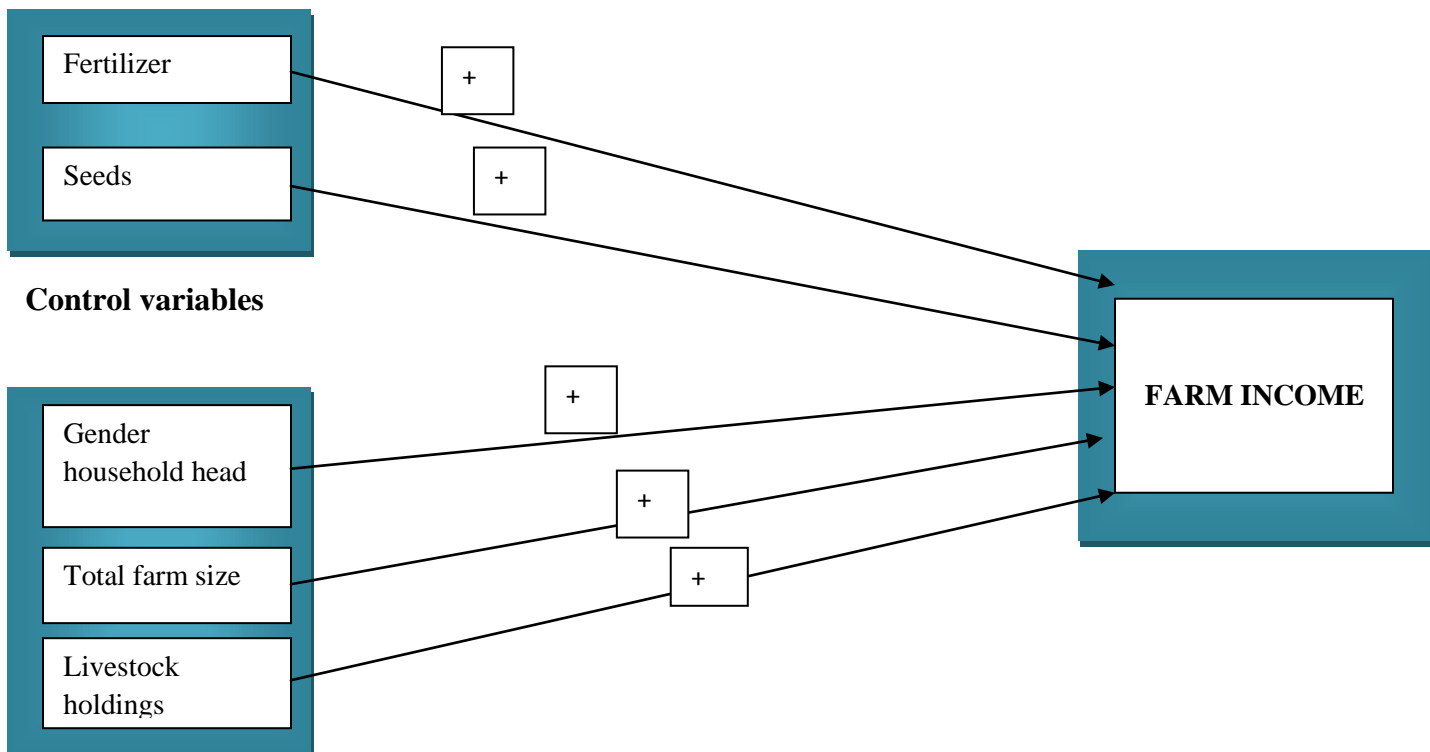


Figure 3 Effects of agricultural support on farm income (research question 3)

We hypothesized that:

H₇ = Access to fertilizer and seeds (agricultural support) lead to higher farm income of the households.

H₈ = Male headed households have higher farm income than female headed households

H₉ = The larger the farm size cultivated, the more farm income gotten by the household

H₁₀ = Households livestock ownership leads to higher farm income.

CHAPTER 3 CASE

This chapter gives an overview of the problems faced by the agricultural sector and agricultural production in Nigeria. It gives a summarized insight on the trend of the Nigerian agricultural sector, starting from when it was the pillar of economic development until when it was neglected as a result domination of the petroleum industry. The explains the possible reasons for low agricultural productivity and why farm households diversify into off-farm activities.

3.1 Historical background of agricultural sector in Nigeria

In most sub-Saharan African countries (including Nigeria), agricultural development is considered as the pillar of economic development. In Nigeria, four major sectors contribute to the total output of the economy. These include, the agricultural sector, then oil/petroleum sector, the manufacturing sector and the service sector. The agricultural sector entails crop production, forestry, livestock and fishing. Historically, agriculture remained the highest contributor to the Nigerian economy's GDP with an average of 40.1% throughout the entire period. This indicates that agriculture is of crucial importance in relation to economic development. Therefore, more of the efforts to revive the economy and to reduce poverty drastically should be devoted to give a new and improved structure to the agricultural sector (Oni, 2013).

During the pre-independence era, investment projects were executed by the Nigerian government through agricultural product export earnings. Nigeria's agricultural export commodities contributed over 75% of the total annual merchandise export in the 1940s and 1950s (Ekpo and Egwaikhide 1994; Oyejide 1998). Agricultural products dominated Nigerian's non-oil export trade during this period, accounting for almost 70% of the value of non-oil exports. The Nigerian agricultural export commodities included cocoa, rubber, cotton, palm oil, palm kernel, groundnut and coffee. These agricultural products played an important role in economic development providing the needed foreign exchange for development projects. Thus, in the colonial era, the agricultural export commodities constituted the main export trade basket (Oni, 2013).

However, the introduction of petroleum has changed the structure of the export trade. In the 1970s the petroleum sector became more important and overwhelmingly important that the economy is being over-dependent on it, providing about 95% of foreign exchange earnings, as well as 65% of budgetary revenues (CBN, 2011). Numerous policies and programs have been

initiated by the government, in order to restore the agricultural sector to its place. Numerous efforts at promoting investments and export diversification in agricultural sector have not yielded good outcomes. The share of the agricultural sector earnings in foreign exchange has declined from an average of about 11% in the 1970-1975 sub-period to an average of about 2% in the 1991-1995 sub-period (CBN, 2003). Government effort to reverse this situation has so far yielded limited results as oil continues to dominate the country's export, while the share of agricultural exports out of Nigerians total export remained below 5% for most years since the introduction of Structural Adjustment Program (SAP) (Oni, 2007).

In spite of the governments enormous effort to reposition agriculture to its place of food production for consumption, raw materials for industries and generation of foreign exchange earnings and provision of employment; the rate of capacity utilization by agro –industry has been declining. Reason for this is irregular and inadequate supply of raw materials. There has been a weak linkage of agricultural sector to the industry. It is of vital importance to maintain equilibrium between requirements of raw materials for industries, human consumption needs and the capacity of agriculture to supply the raw materials (Oni, 2013).

The federal Republic of Nigeria is endowed with 74 million hectares of arable land and 2.5 million hectares of irrigable land. Nigeria has one of the best agro–ecology to grow crop varieties. Basically, Nigerian environment is characterized by fair to good soil, but has poor and unreliable rainfall (Oriola, 2009). Apart from the agricultural sector being the principal non-oil foreign exchange earner, it employs over 60% of the population (Liverpool-Taise et al., 2011; Oseni and Winter, 2009). Liverpool-Taise et al. (2011) reported that regardless of the rate of urbanization in Nigeria, about two-thirds of the population still resides in the rural area and engages in smallholder agricultural production.

Aderibigbe (2001) stated that before crude oil was discovered, Nigeria flourished on agriculture. Oil discovery, followed by subsequent neglect of the agricultural sector by the Nigerian government has led to a decline of growth in this sector. As a result, the government could not achieve their set objectives on all the food production programs that has been established (Oriola, 2009). There began a fall in the domestic food production and the country transformed from a food sufficient net exporter to a net importer of many agricultural products including

palm oil, rice, maize and wheat (Ogen, 2007). Apart from the neglect which the agricultural sectors suffered from in Nigeria, there was also a decline in production. The reason for decline in production is that there has been inadequate credit for investment in agriculture-enhancing technologies.

Liverpool-Taise et al. (2011), reported that there is a wide spread of inefficiency and low productivity among farmers in Nigeria; most farmers produce significantly below their production frontier and profit margins. The prevention of substantial reduction in poverty has been attributed to this low return in agricultural production, especially in the Nigerian rural areas. Oseni and Winter (2009) reported that in Nigeria, more than 80% of the rural households related their poverty status to problems in the agricultural sector and specifically to the lack of access to inputs and inadequate money to purchase inputs such as seeds and fertilizer. Rural farm households often diversify their livelihood from farm to off-farm activities in order to overcome this problem. In Nigeria, the majority of households across all income strata are involved in many off-farm activities, which has gained increased importance over the last 25 years (OPM, 2004). The report suggested an average of 36% of the working hours for adult per year and 60% of cash income. Meagher (1999) reported that in Nigeria, non-farm activities are diverse, partly seasonal and performed within the family.

3.2 Study area

The study was carried out in Umuawa village, Ovuokwu in Isi-ala Ngwa South Local Government Area of Abia State, Nigeria. Abia State is one of the 36 states of Nigeria. This study area is of particular interest as farmers living in the South Eastern Nigeria have diversified their income to off-farm activities. Farming is the most important occupation in the village. Most of the farmers in the study area engage in arable crop production such as melon, maize, cocoyam, cassava, three-leaved yam, yam and others. They also produce certain fruits like mango, orange, pear, avocado pear and others. In addition, the farmers in the study area also rear few livestock mostly goat, chicken, and sheep. The farm enterprises are small. Some of the off-farm activities undertaken by the farmer households include trading (trading of food items, fruits and vegetables, provision stores etc), sewing, palm wine tapping, farm labour, craft (leather works and weaving, making pots, carpentry work, carving calabash and wood). Some other off-farm

activities that are also gaining importance in rural Nigeria include car repairs, hair dressing salons and welding etc.

This area is of interest in this research considering the fact that the area has been popular for the production of food plants in Abia state, an eastern state of Nigeria. Thus, Abia state has been known to generate high farm produce and this necessitated this research in Umuawa village which is among the greatest food production region in comparison with other regions in Abia state. Abia State is an agricultural investor's delight, with fertile lands and located in the rainforest belt of Eastern Nigeria. Most crops do very well in the state. The State had numerous commercial agricultural companies but most of them packed up over time due to mismanagement and corruption.

CHAPTER 4 METHODOLOGY

4.1 Data collection

In this survey, 100 households were sampled but due to some constraints of financial, time, distance and absenteeism of some households during the time of the survey, only 70 households were finally surveyed using simple random sampling method. The random selection was done by interviewing one household after every two households in the village. Starting from a point or street, the 1st household was interviewed, followed by the 4th, 7th, 10th household and so on. Primary data were collected through a structured questionnaire. The primary data was obtained from a cross-section survey of each household that was selected randomly in the study area. Information was elicited from each household about their various farm production and off-farm activities and their various income generated respectively in the 2003/2004 farming season; also information about whether the households is a beneficiary of government support or not. The questionnaire was also designed to gather information on the composition of the household and other socio-economic characteristics of the household.

Income generating activities were disaggregated broadly into different categories such as: 1) Income from crops; 2) Income from fruits; 3) Income from vegetables; 4) Income from livestock; 5) Income from off-farm activities; 6) Other income sources such as agro-processing, pension, gifts and remittance income received from friend or relatives not presently living in the household. Information was also gathered from the households expenditure on food and non-food items for the past one month and the past one year, household food consumption pattern.

4.2 Data analysis

4.2.1 Descriptive statistics

4.2.1.1 Household socio-demographic factors

Data was analysed using descriptive statistics (such as means, tables, frequencies, percentages) in order to summarize the selected household characteristics derived from the sample in order to know the frequency distribution of variables among farm households. The farm households characteristics were described based on the following variables;

Table 1 Analysis of households socio-demographic characteristics

Variables	Description
Household size	Average size of the household
Gender	Dummy for gender of the household head (Male=1, Female=0)
Age	Average age of the household head (yrs)
Education	Education status of the household head
Farm size	Average farm size cultivated (ha)
Farm Income	Average total farm income of households per year (Naira)
Off-farm income	Average total off-farm income of households per year (Naira)
Off-farm participation	Dummy for off-farm participation of the household (Yes=1, No=0)
Fertilizer support	Dummy for access to fertilizer support (Yes=1, No=0)
Seeds support	Dummy for access to seeds support (Yes=1, No=0)
Agro processing	Dummy for engage in agro processing (Yes=1, No=0)
Remittances	Dummy for income from remittances (Yes=1, No=0)
Pension	Dummy for income from pension (Yes=1, No=0)
Gifts	Dummy for households that receive gifts (Yes=1, No=0)
Transportation	Different kinds of transportation used by the household
Water	Dummy for buying water (Yes=1, No=0)
Housing	Kinds of houses households live in

4.2.1.2 Structure of household incomes

Descriptive statistics (such as minimum maximum, mean and standard deviation) was used to summarize the average composition of farm households incomes.

Table 2 Analysis of the composition of household incomes

Different income sources	Number of households (N)	Minimum income (naira)	Maximum income (naira)	Mean annual income (Naira)	Standard deviation
Yearly off-farm income					
Yearly farm income					
<i>Crop/vegetable income</i>					
<i>Fruit income</i>					
<i>Livestock income</i>					
Other incomes					
Overall income					

4.2.2 Analysis

4.2.2.1 Determinants of off-farm participation

To examine the determinants of off-farm participation, we accessed the relationship between participation in off farm and household socio economic factors using logistic regression model.

The general formula for logistic regression model is as follows

$$Y = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + \dots + b_6X_6 + U \dots (1)$$

Y_i = binary value that takes the value of 1, if the person participates in off-farm activities and 0, if the person did not participate.

Y_i = Off-farm participation

X_1 = Education status of the household head

X_2 = Age of the household head(yrs)

X_3 = Household size (numbers)

X_4 = Farm size cultivated (ha)

X_6 = Gender of the household head

U = Stochastic residual term, assumed to follow the logistic regression.

4.2.2.2 Impacts of off-farm participation on the overall income of the farm households

Box plot was used to assess the impact of off-farm participation on the overall income of the farm households and statistically, non-parametric test was used to determine the difference between the overall income of the two groups.

Group 1 = households with off-farm activities

Group 0 = households without off-farm activities

4.2.2.3 Effects of agricultural support on the farm income of the farm households

Linear regression analysis was used to assess the effects of agricultural support (fertilizer and seeds) on farm income, adding gender of the household head, farm size and livestock holdings as control variables.

$$Y_i = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \dots + \beta_4 X_{4i} + \beta_5 X_{5i} + e \quad \text{Where;}$$

Y_i = Farm income

X_1 = Fertilizer

X_2 = Seeds

X_3 = Gender of the household head

X_4 = Farm size cultivated (ha)

X_5 = Livestock holdings of the household

e = error term

CHAPTER 5 RESULTS

5.1 Descriptive statistics

This chapter summarizes the survey data of 70 households about their socio-demographic characteristics, off-farm activities, farming, agricultural support by the government and some information on their livelihoods (such as source of food and consumption pattern, transportation, housing etc.), which can be seen as representative of the entire population in the study area.

5.1.1 Households socio-demographic characteristics

Table 3 summarizes the characteristics of the farm households. A household refers to all the people living in the same home and sharing the same meal which include father, mother, children and any other person such as father in-law, mother in-law, house help, sister in-law etc. (Tiziana, Ernestina and Sara, 2010). Among the 70 surveyed farm households, the majority of these households (52.9%) included up of 3 to 5 persons. The household head which in most cases was a man (only 21.4% of household heads were women because their husbands have passed away) was on average 55 years old and had low educational levels. On average we found that 60% of the household heads enjoyed primary education, while only 30% had finished secondary school.

5.1.2 Households Farm activities

Almost all households surveyed (91.4%) owned land and they all farmed on their lands. The majority of these households (87.1%) also farmed on other peoples' land acquired through rents or pledge. 'Pledge' means that the farm owner gives out the farm to another person and take some specified amount of money in return, based on a specified agreement. Therefore the farm owner cannot redeem the land until he gives back that specified amount of money to the non-owner of land. 'Rent' means that the land user pays some money to the land owner and use it for a farming season after which the land owner takes it back. Table 4 shows that the average farm size owned by the households was 0.9 hectares and the average farm size rented or pledged was 1.07 hectares. As shown in table 4, about 80% of the farm households performed off-farm jobs and the spent on average 21 days per month on performing these off-farm jobs (such as farm labourer, palm wine tapping, hair making, brick laying etc.) for which they earned on average a yearly income of about 116 thousand Naira¹.

¹ Note: 116 000 naira is equivalent to 580 dollars

As shown in table 5, the majority of farm households (58.6%) received only fertilizer support and 24.3% received both fertilizer and seeds support from the government. Among other income sources, all households received income from agro-processing while 45.7% of the households received income from remittances.

Further, we found that in the study area all the farm households cultivated cassava. This is because cassava, processed into Garri, is the main food consumed in the study area. Another major crop is maize which in this case was cultivated by 97% of the households. Other crops cultivated by the households includes yam and three-leaved yam. Almost all households (98%) cultivated fluted pumpkin because it grows very well in the soil as it can only require the application of inorganic fertilizer in order to grow very well. Other vegetables such as okra, melon, pepper etc. were not cultivated by the majority of the households. Further the households cultivated fruits: mostly oranges (64.3%) and pears (68.6%); and reared mostly chicken (70.6%) and goat (78.6%). Few households reared sheep (11.4%) and none of them had cattle.

Table 3 Result on household socio-demographic characteristics

Characteristics	%of Households
Household size (persons)	
1-2	5.7
3-5	52.9
6-8	38.6
9-11	2.9
Head's age in years	
30-40	7.1
41-50	25.7
51-60	40.0
>60	27.1
Head's gender	
Male	78.6
Female	21.4
Head's education	
No schooling	1.4
Primary school	60.0
Junior secondary	7.1
Senior secondary	30.0
University	1.4

Table 4 Summary statistics

Summary statistic	Head's age	Size of owned land(Ha)	Size of non-owned land(Ha)	Yearly off-farm income (naira)	Households off-farm days per month
N	70	69	69	56	56
Mean	55.99	0.98	1.07	116 332.14	21.1429
Median	55.00	1.00	1.00	86 000.00	16.5000
Std.dev	10.99	0.58	0.56	128 250.67	16.00
Minimum	33	0.00	0.00	12 000.00	12.8112
Maximum	82	2.50	2.00	930 000.00	70.00

Table 5 Farm households agricultural support and other sources of income

Input	% of Households
Support service	
Fertilizer	58.6
Seeds	24.3
Both	24.3
Source of income	
Agro-processing	100.0
Remittances	45.7
Pension	3.0
Gift	2.9

5.1.3 Households off-farm activities

Figure 4 shows that among all the different types of off-farm jobs² which households engaged in, farm labourer (60.8%) was the most off-farm job undertaken by the farm households. This is probably due to the fact that farming is the main occupation of households in the research area and farm labourer as an off-farm job requires little or no skills before being carried out; this is because households members gain experience of farm labourer from the family from generation to generation.

Figure 5 shows that farm households engaged in off-farm activities mostly between April and September because it is the period of rainy season and when farm cultivation, weeding and other farming activities/processes are done in the study area. Other off-farm activities apart from farm labourer are done mainly between December and March because this period is the peak of dry season where there are almost no rainfall. Farming cultivation is not done during this periods but rather harvesting of farm produce.

² Off-farm income has been defined many different ways in literature. However, income from all non-farm activities plus agricultural wage labour seem to be a common definition of off-farm. In line with this definition, off-farm income includes self-employed income, non-agricultural wages, agricultural wages and remittances such as gifts etc.

Among the household members, household heads (48.5%) participated most in off-farm activities followed by their wives (37.4%). Children and other household members participated less in off-farm activities. In figure 6, it is shown that about 59.4% of the total farm households agreed that engaging in off-farm job was very important while few farm households said it was not important.

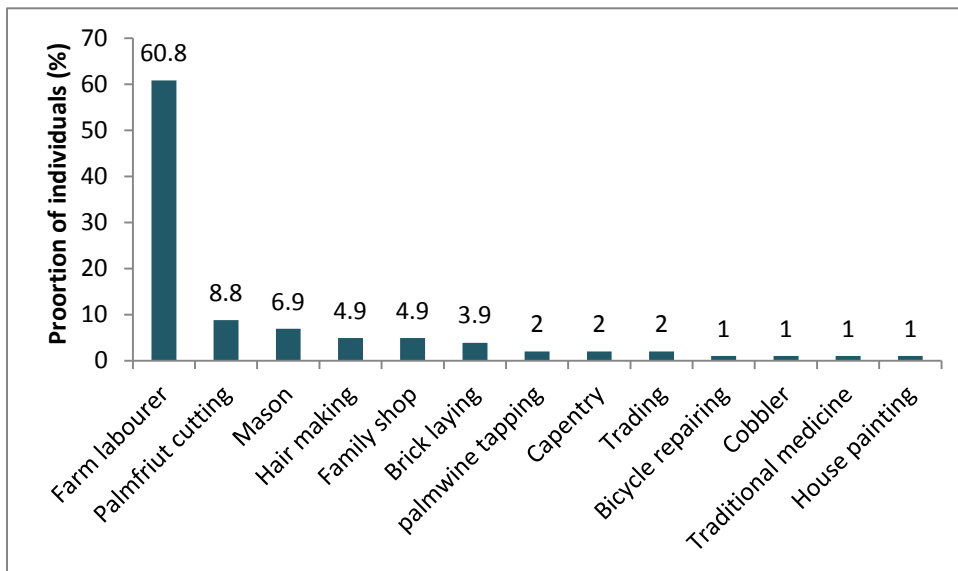


Figure 4 Different kinds of off-farm activities engaged by farm households

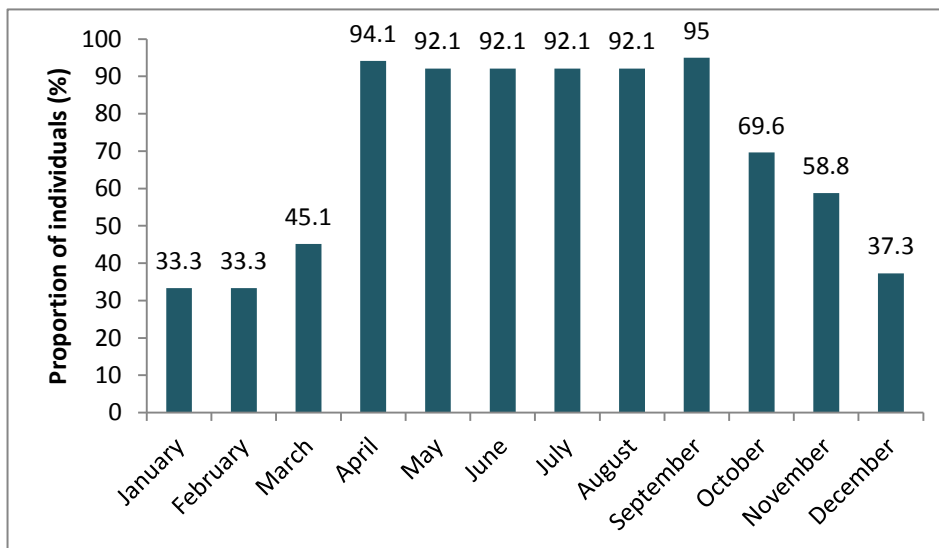


Figure 5 Months farm households engage in off-farm activities

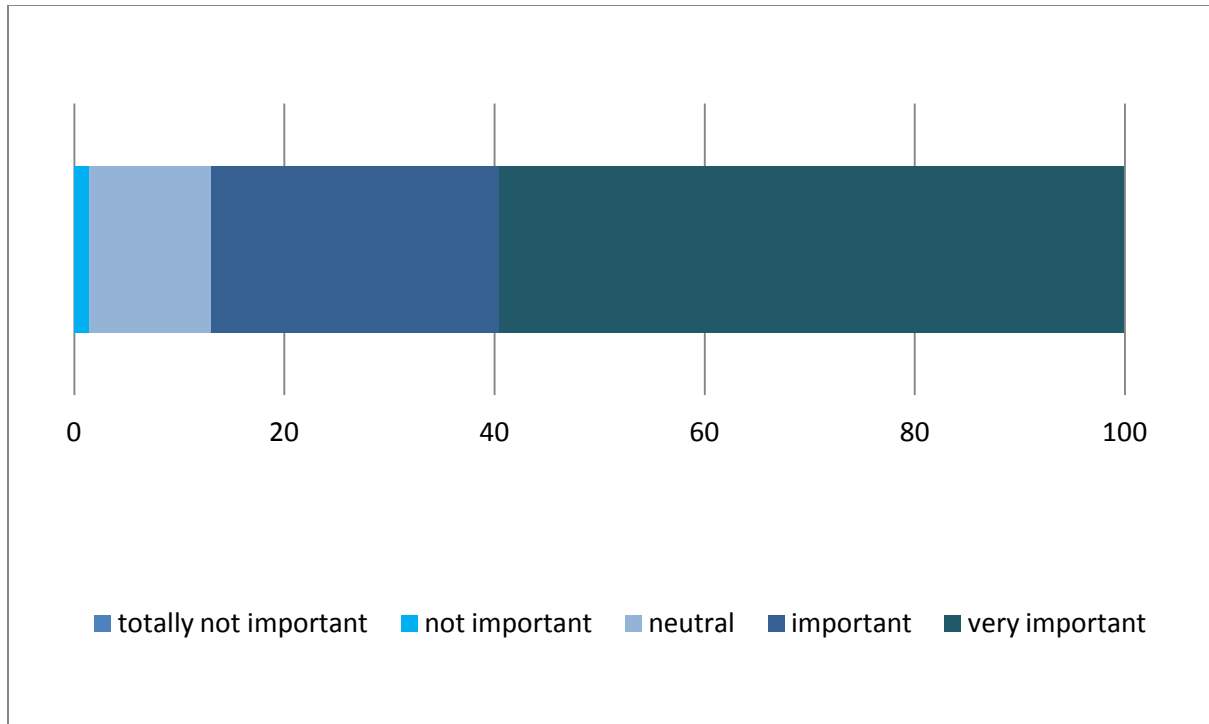


Figure 6 Household's perception of the need to go into off-farm

5.1.4 Information on households livelihoods

Table 6 shows that households consumed all the classes of food based on the day before (yesterday) consumption but their highest consumption was on oil and fats (100%), roots and tubers (97.1%), Vitamin A rich vegetables such as pumpkin, waterleaf etc. (98.6%) and fish (80%). The households consumed mostly roots and tubers foods (6 days), oil and fats foods (6 days) and other vegetables such as water melon, onion, fresh pepper etc. (4 days) more days in a week than the other food groups listed in the table. Most often the source of food groups consumed by the households was own production especially when it comes to maize, roots and tubers (such as cassava, yam etc.) and oil and fats foods (such as palm oil). Some other foods were entirely purchased by the households including other cereals (such as bread, rice, wheat etc.) red meat and legumes, nuts and seeds (such as beans, groundnuts etc).

Based on the households water use practices, we found that the majority (83%) of the surveyed households bought water and there were no government boreholes, stream, or well water. About 91.4% of the households faced difficulties transporting their produce to the market. This was because 98.6% of the farm households major means of transportation is bicycle. Few households had car, motor cycle and used public transportation. On the basis of housing, 97.1% of the farm

households surveyed in the study area are living in their own houses, although the quality of the houses are the not the same. Also the majority of the farm households (44.3%) live in 3 or 4 (37.1%) bedroom house.

Table 6 Farm households food consumption pattern

Food group	Percentage of consumption on day before interview	Mean consumption days (based on past 7 days)	Percentage of main food source		
			Own production	Purchase	Gifts
Maize products	64.3	3.02	90.6	9.4	
Other cereals	61.4	2.07		100.0	
Roots and tubers	97.1	6.61	98.6	1.4	
Vitamin A-rich fruits and vegetables	98.6	3.31	92.9	7.1	
Other vegetables	92.9	4.19	13.2	85.3	
Other fruits	71.4	3.24	82.4	17.5	
Red meat	55.1	2.26		100.0	
Poultry	2.9	1.50	50.0	50.0	
Fish	80.0	3.66		91.4	
Eggs	10.0	1.27	54.5	45.5	
Legumes, nuts, seeds	55.7	1.93		100.0	
Dairy	38.2	2.14	5.6	94.4	
Oil and fats	100.0	6.91	95.7	4.3	
Sugars	35.7	2.12	4.0	96.0	
Beverages	23.5	1.95	22.2	72.2	5.6

5.1.5 Structure of household incomes

Table 7 shows that different sources of income contribute to the overall household incomes in the sample. All households derived income from crops/ vegetable production. Majority of the households (93% and 97%) received income from fruit and livestock production respectively, whereas, 57% of the households received income from other income sources (such as

remittances, gifts etc.). On average, households earned the most income (about 142,000 naira)³ from crops/ vegetable production, followed by off-farm income (about 116,000 naira), with the least being income from livestock (about 21,000 naira).

Table 7 Results on composition of average household incomes

Different income sources	N	Minimum	Maximum	Mean annual income (naira)	Std. Deviation
Yearly off-farm income	56	12000.00	930000.00	116332.14	128250.67
Yearly farm income	70	10850.00	814100.00	197336.50	120633.76
<i>Crop/vegetable income</i>	70	3600.00	764100.00	142942.14	112827.18
<i>Fruit income</i>	65	2400.00	178000.00	36267.69	30471.86
<i>Livestock income</i>	68	.00	98000.00	21326.54	15591.63
Other incomes	40	2000.00	960000.00	69300.00	178968.44
Overall income	70	80600.00	1106500.00	330002.21	195123.54

5.2 Analysis

5.2.1 Determinants of households off-farm participation

To identify the determinants of off-farm participation (research question 1), we applied a logistic regression as shown in table 8. The results show that age of the household head is a determinant of off-farm participation as it showed a significant, negative relationship with off-farm participation ($p < 0.01$). This means that the older the household heads became, the less they participated in off-farm activities. It is also shown that gender of the household head has a significant relationship with off-farm participation of the household ($P < 0.05$). This is to say that male household heads participated more in off-farm activities than female household heads. Meanwhile, educational status of the household head, total farm size of the household, and household size showed no significant relationship with off-farm participation ($p > 0.05$).

³ Note : Official exchange rate in 2015: 1 US dollar = 196 naira. N= number of households

Table 8 Determinants of households off-farm participation

Determinant	B	Std. Error	Sig.
Household size	0.259	0.328	0.429
Education status (secondary+)	-1.100	0.900	0.222
Age	-.138	0.052	0.008***
Gender(male)	2.286	1.165	0.050**
Total farm size	1.426	0.971	0.142
Constant	5.657	4.436	0.202

***, **, * indicate statistical significance at 1%, 5% and 10% levels, respectively.

5.2.2 Impacts of off-farm activities on the overall income of the households

We analyzed the impacts of off-farm participation on overall income of the households (research question 2), by comparing the overall income of two groups namely; households that participated in off-farm (denoted by 1 in the figure) and households that did not participate in off-farm (denoted by 0 in the figure), using box plot as shown in Figure 7. The result shows that the mean overall income of the households that participated in off-farm activities is higher (much closer to 400 000 naira) than those of the households that did not participate in off-farm activities.

However in table 9, statistically using Nonparametric tests to determine if there is a difference between the overall all income of households that participated in off-farm and those that did not participate in off-farm, the result shows that the medians of overall incomes are the same across categories of households, with a p-value = 0.135. Therefore, statistically there is no difference between the mean overall incomes of the two groups (households that participated in off-farm and households that did not participate in off-farm).

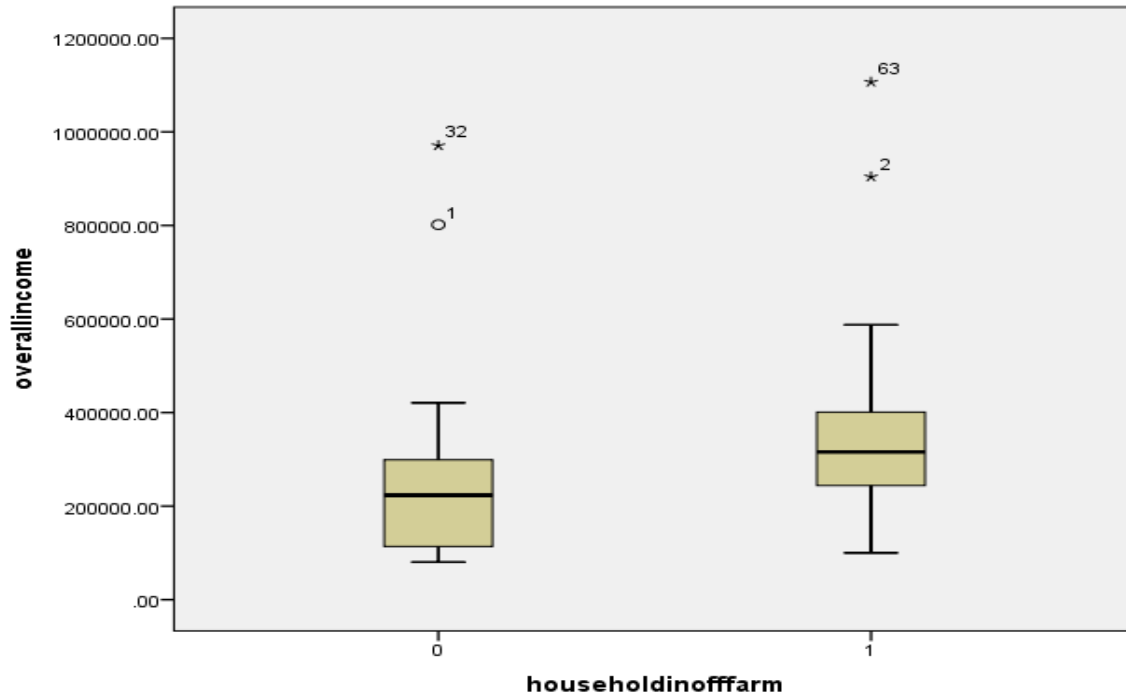


Figure 7 Impacts of off-farm participation on the overall income of the households

Table 9 Analysis of the difference between the overall income of the two groups (households in off-farm and households not in off-farm)

Null Hypothesis	Test	Sig.	Decision
The medians of the overall income are the same across categories of households in off-farm	Independent-Samples Median test	0.135	Retain the null hypothesis

Note: The significance level is 0.05

5.2.3 Effects of agricultural support on households farm income

To determine if agricultural support results in higher farm income (research question 3), we modelled “fertilizer and seeds”, and added “gender of the household head, total farm size of the household and households livestock holdings” as control variables as shown in table 10. The conclusion of the result is that that fertilizer and seeds do not have any effect on farm income (p

> 0.05) but “total farm size of the household and gender” showed a significant relationship with farm income ($p < 0.01$). This shows that the larger the farm size cultivated, the more the household received farm income; also male headed households tend to get more income from farm than female headed households.

Table 10 Effects of agricultural support on households farm income

Determinants	Unstandardized Coefficients		Sig.
	B	Std. Error	
(Constant)	-34501.654	81903.574	0.675
Fertilizer	19961.721	32239.998	0.538
Seeds	18154.769	35884.233	0.615
Gender of household member(males)	59049.243	33626.854	0.084*
Total farm size	80895.932	29018.775	0.007***
Livestock holdings	6800.954	65821.583	0.918

***, **, * indicate statistical significance at 1%, 5% and 10% levels, respectively

CHAPTER 6 DISCUSSION OF RESULTS

6.1 Discussion on descriptive statistics

6.1.1 Households socio-demographic characteristics

The majority of the household heads attended primary schools more than secondary schools which can probably be explained by the fact that the density of primary schools is relatively high in the rural areas of Abia State. Another reason may be because it was long time ago, when there was no much awareness on the needs of education, parents did not see the need for their children to continue with secondary education; but rather preferred their children to help out in the house or farm other than continue with secondary education.

6.1.2 Household farm activities

The average total farm size cultivated by the households was 1.97 hectares which appears reasonable for rural areas. This can be compared with the Nigerian national average of 2 hectares (Babatunde and Qaim, 2009). This may be probably because in the rural areas, they only used land mainly for building own houses and farming. Therefore they had more land for farming. This may be different in developing communities where lands were used for many other things other than farming and building own houses for example, building of more houses for migrants, offices, industries, companies, more road construction etc., land for farming would be reduced in such developing communities. All the households engaged in crop production because it is by far the most single source of income and consumption. For example, all the farm households cultivated cassava. This is because cassava, processed into Garri, is the main food consumed in the study area. In the region, Garri can be a full day meal; it can be eaten in the morning as breakfast, also eaten as lunch and also as dinner.

Another major crop is maize which in this case was cultivated by the majority of the households because it is simple to plant and it also grows well in the soil. Other crops cultivated by the households included yam and three-leaved yam. A major vegetable cultivated was fluted pumpkin because it grows very well in the soil as it may only require the application of inorganic fertilizer in order to grow very well. Other vegetables such as okra, melon, pepper etc. were not cultivated by the majority of the households. This is because these crops have very short lifespan of about 2 to 4 months (from the time of cultivation to the time of harvest) and therefore farm households did not cultivate them on large pieces of land. Most households produced oranges

and pears because they bring more income to the household when sold than avocado, banana, etc. Similarly, mostly chicken and goats were reared because they are the most common animals in the study area and they have higher market prices than sheep and adult cattle. Sheep are mostly found in the Northern areas where there are a lot of Muslims who eat sheep/ lamb more than goats and also cattle are most reared in Northern Nigeria.

6.1.3 Households off-farm activities

More than half of the households engaged in off-farm activities probably because they get an additional income from off-farm to support household expenditure and off-farm seems less risky than agriculture in terms of poor crop production, inadequate income to meet up farming demands etc. Farm labourer was the most off-farm activity undertaken by the farm households. This is probably due to the fact that farming is the main occupation of households in the research area and farm labourer as an off-farm job requires little or no skills before being carried out; this is because household members gain experience of farm labourer from the family from generation to generation. Farm households engaged in off-farm activities mostly between April and September because it is the period of rainy season and when farm cultivation, weeding and other farming activities/ processes are done in the study area. As a result, farm labourer being the most engaged off-farm activity is expected. Other off-farm activities apart from farm labourer were done mainly between December and March because this period is the peak of dry season where there are almost no rainfall. Farming cultivation is not done during this periods but rather harvesting of farm produce and other types of off-farm activities such as brick laying, hair making, palm wine tapping, mason, carpentry, bicycle repairing, traditional medicine, house painting, trading etc.

Male household heads participated most in off-farm activities followed by their wives probably because husbands do more extra works other than farming in order to support the family income than their wives. The reason is that most times women are occupied with taking care of the children and doing other house chores. In general, parents (both men and women) participated more in off-farm activities because they were more experienced than other household members. Children and other household members participated less in off-farm activities because they go to school and/or may help in other household chores. Providing family needs is almost the sole responsibility of the parents until their children can live independently.

The majority of the farm households agreed that engaging in off-farm jobs was very important probably because it brought additional income to the household, thereby helping to cater for family needs. Few farm households said it was not important probably because they did not participate in doing off-farm jobs and have not experienced if there are benefits of participating in off-farm or not. Also probably because they have sufficient income from other sources other than off-farm.

6.1.4 Households' livelihoods

The highest consumption of the households were on oil and fats. This is expected because palm oil for example, is used to cook about 90% of food consumed in the area. Roots and tubers (such as cassava) and and Vitamin A rich vegetable (such as pumpkin, waterleaf etc.) were also mostly consumed because cassava processed into Garri, and soup made of vegetables were consumed together sometimes during breakfast , lunch and dinner in one day. Another reason is that these foods that the households consumed most often were own production, so they did not spend some money in order to consumed these foods. Other foods such as red meat, rice, beans, bread etc. were consumed less because they purchased the foods, therefore they could not eat these foods without spending money to purchase them.

The majority of the households bought water because there were no government boreholes, stream, or well water. Therefore, in order to get water for household use, it must be from a private borehole either by purchase or free from friends that have private boreholes. Majority of the households faced difficulties transporting their produce to the market. This was because 98.6% of the farm households' major means of transportation was a bicycle and indeed it is very difficult to transport farm produce to the market with bicycle. Few households had car, motor cycle and used public transportation because they are luxury and only few could afford them. Almost all the households lived in their own houses, although the quality of houses were not the same. For example, some households lived in thatch house, uncompleted building, zinc roofed house, mud house etc.

6.1.5 The structure of household incomes

All households derived income from farming which accounts for a little above 50% of the overall households income. The rest of the income was derived from off-farm sources which is a bit less than 50% of the total income. This result is logical in the study area in the sense that the

predominant occupation of the households is farming and has been their source of livelihood for decades. Having an average total land size of 1.97 hectares, it means that land is not the most limiting factor of production as the case may be in other areas, therefore they tend to do a lot of farming. In addition, the study area has a level ground with a heavy rainfall of about 2,400mm per year (Iheke and Oliver-Abali, 2011) which is very good for farming. This means that farming is the main source of their livelihood while income from off-farm sources supplement farm income. Similar to this findings, Babatunde et.al., 2009 and other available literature (for example, Croppenstedt, 2006; Deininger and Olinto, 2001; Woldenhanna and Oskam, 2001) also argue that farming contributes 50% of the total income of the households while the other 50% was derived from different off-farm sources, although what constitutes off-farm income slightly differs across studies.

6.2 Discussion on Analysis

6.2.1 The determinants of households off-farm participation

Our result showed that the age of the household head was a significant determinant of off-farm participation. This makes sense because older household heads tend to participate less in off-farm activities in the sense that off-farm is an extra work that is done in order to get an extra income to support the needs of the family and the older household heads will not have that extra energy to do other works apart from working on their own farms. So older people are at a disadvantage. Therefore household heads who are younger participated more in off-farm because they tend to have more energy to do more work apart from the normal household farming in order to get extra income. Our findings is similar to that of Babatunde et al., (2009) in Nigeria where age has a differential impact on participation in different kinds of off-farm activities explained by different physical fitness requirements for off-farm participation.

The gender of the household head was also significantly correlated with off-farm participation. In that sense, male headed households participated more in off-farm activities than the female headed households. Literature has also found similar results (Babatunde et al., 2009 and Beyene, 2008) where male headed households are likely to participate more in off-farm activities than female headed households. Although in the region there are no cultural differences where women are not allowed to do some kinds of off-farm activities, female headed households are often those

where the husbands have passed away, therefore women had to spend more time on their own farms and household chores to maintain a minimum livelihood level.

Education status of the household head showed no significance with off-farm participation. This is probably because their main off-farm activity was farm labourer which requires less skills than other off-farm activities. Farming experience is gotten from the family and transferred from generation to generation and requires less skills than other off-farm activities. Therefore, they do not really need a high level of education before starting up off-farm jobs especially farm labourer. Studies of Woldehanna (2000) and MOLSA (1997), and Beyene (2008) support this findings in their different studies. Babatunde et al. (2009) also confirms that schooling does not seem to be important for agricultural wage labourer, but rather it significantly increase the opportunity of getting employment in non agricultural sectors.

Farm size does not show a significant effect on off-farm participation. In that sense, participation in off-farm activities is not primarily a response to land constraints but rather the desire to have more income for household use. Off-farm income nevertheless significantly contributes to total household income. Literature has also found similar results where land constraints is not the primary reason for off-farm participation (Babatunde et al., 2009). Babatunde et al. (2009) confirmed this result in studies on determinants and impacts of income diversification in rural Nigeria by arguing that shrinking land availability and a surplus rural labour force are not the main reasons for income diversification in rural Africa. Javier (2001) in his study on the determinants of non farm income diversification in rural Peru also found that while ownership of fixed agricultural assets (land and livestock) increases share of farm income of the household, the need for undertaking wage employment in the farm and non-farm sectors reduces with ownership of fixed agricultural assets.

Participation in off-farm activities was not correlated with household size. This may probably be because household heads (husband and wife) mostly engaged in off-farm while the children and the other household members seldom went into off-farm. In the region, children scarcely go into off-farm. It is mostly the responsibility of the parents to work off-farm. Therefore the size of the household was not important for off-farm participation of the household, since it was mostly the

parents that worked off-farm. However this is contrary to the findings of Babatunde et al. (2009) where off-farm participation is positively related to household size.

Table 11 Summary Result research Question 1 (determinants of off-farm participation)

H ₁ = The larger the farm size cultivated by the household, the less they will participate in off-farm activities.	Reject hypothesis
H ₂ = The older the household head become, the less he participates in off-farm activities.	Accept hypothesis
H ₃ = Male headed households are likely to participate more in off-farm activities than female headed households.	Accept hypothesis
H ₄ = The higher the education level of the household head, the more he will participate in off-farm activities.	Reject hypothesis
H ₅ = The larger the household size, the more they will participate in off-farm .	Reject hypothesis

6.2.2 Impacts of off-farm participation on the overall income of the households

The mean overall income of the households that participated in off-farm activities was higher than those of the households that did not participate in off-farm activities. This is expected because off-farm is additional work to get more money for household needs. A certain amount of wage is received after an off-farm job. From this, it probably follows that those that engaged in off-farm activities are more likely to meet their household needs and to withstand shocks (for example, crop failure) and have a more stable livelihood than those that have farming as a single source of their income. According to Babatunde et al. (2009) cash income from off-farm activities can help to purchase agricultural inputs and increase land holdings, given the significant failures in the rural credit markets. Therefore, it is much easier for households with access to off-farm income to increase their agricultural incomes.

Table 12 Summary Result Research Question 2 (Impact of off-farm participation on households overall)

H ₆ = Households that engage in off-farm will have more income than household that did not participate in off-farm.	Accept hypothesis
--	-------------------

6.2.3 Discussion on effects of agricultural support on household farm income

Fertilizer and seeds were modelled as agricultural support but they showed no significant correlation with farm income. This means that current agricultural support did not have any effect on households farm income. The reason could be that the farmers may not have an adequate knowledge on how to plant the improved seeds, and what quantity and when to apply fertilizer to cultivated crops probable because of lack of extension services. This may have a reduced effect on their farm produce thereby affecting farm income level. Findings from literature by Esther, Michael and Jonathan (2008) in Kenya and Andrew and Ephraim (2011) in Malawi confirms that the return to fertilizer is sensitive to its way of usage. Application of fertilizer and seeds may be profitable when used correctly and vice versa.

From our result, it followed that male headed households tended to have more farm income than female household heads. Males tend to have farming support from their wives other than female headed households who work and make decisions about the household alone. Female headed households are mostly those that their husbands have passed away and they combine both farming and other demands of the household. In the region, men easily re-marry when their wives pass away but this is not the case for women. In that sense, it cannot be concluded that women are less efficient than men. Agnes (1996) confirms that female farmers are equally as efficient as male farmers in her study on differences in technical efficiency between male and female farmers once individual characteristics (such as different roles of men and women in the household) and levels of input are controlled for. Agnes (1996) added that works in Burkina Faso also indicated that lower intensities on input on women's plots of land, which results to lower agricultural production are due to asymmetric roles and obligations in the household.

Our results also indicated the larger the farm size cultivated, the larger the farm income became. It is logical to assume that every additional hectare may lead to more farm production and thus more farm income. The result from this analysis supports the hypothesis of positive relationship between farm size and productivity. Similar results were found by Andrew (1999) in Malawi showing a positive relationship between farm size and productivity using a regression on the net output per hectare across different land holding sizes.

It was also showed in our results that livestock holdings of the household did not have any effect on households farm income. This does not mean that livestock does not contribute to households

income but rather because in the region livestock holdings were small and not the main source of their income but rather crop production. Therefore, if they had invested more on livestock, it would increase their farm income levels. To support our argument, works in Ethiopia, while examining the contribution of livestock to farm income showed that a significant proportions of farm cash incomes originate from trade in animals and sales of livestock products which accounted for 56% and 31% of the farm cash income respectively (Jutzi et al., 1988).

Table 13 Summary Result Research Question 3(Effect of agricultural support on farm income)

H ₇ = Access to fertilizer and seeds (agricultural support) lead to higher farm income of the households.	Reject hypothesis
H ₈ = Male headed households have higher farm income than female headed households.	Accept hypothesis
H ₉ = The larger the farm size cultivated, the more farm income gotten by the household.	Accept hypothesis
H ₁₀ = Households livestock ownership leads to higher farm income.	Reject hypothesis

CHAPTER 7 CONCLUSION

7.1 Conclusion

In this article, we have examined the determinants and impacts of off-farm participation and agricultural support systems on the overall income of the rural farmers in Umuawa, Abia State Nigeria. In line with previous studies from other countries in the rest of the world, we have shown that off-farm income is very important for the vast majority (Babatunde et al., 2009; Croppenstedt, 2006; Deininger and Olinto, 2001; Woldenhanna and Oskam, 2001). Almost 81% of all surveyed households in Umuawa, Abia State had at least some off-farm income. On average, off-farm income accounted for a little above 50% of the total household income. Farm labourer (Agricultural wage employment) was the dominant source of off-farm income because over 60% of the households engaged in it. We have also shown that households with off-farm activities have higher overall income than households with a single source of income, indicating that households that engaged in off-farm activities are more likely to meet their household needs, to withstand shocks (for example, crop failure) and have a more stable livelihood than those that have farming as a single source of their income.

In this study, the logistic regression showed that age and gender of the household head were the only significant determinants of households off-farm participation, whereas household size, education status and farm size cultivated showed no significant relationship with off-farm participation. The result on farm size challenges the widely diffused notion that shrinking per capita land is the main driver of the increasing importance of off-farm activities. This is particular to land-rich areas in some parts of sub-Sahara Africa, but it is quite different from areas like Asia where there are more dense population; they may tend to have smaller land sizes for farming. Our study also showed that the importance of education in off-farm participation depends on the type of off-farm activities, a finding that has also been confirmed by other authors (Beyene, 2008; Corpal and Reardon, 2001).

From our results, the regression analysis showed that current agricultural support in the study area had no effect on the farm households' farm income, which may be attributed to inefficient use of inputs (fertilizer and seeds). A number of other studies (Andrew and Ephraim, 2011; Esther, Michael and Jonathan; 2008) have also confirmed that the profitability of inputs is sensitive to the way it is used. Our study further showed that male headed households tended to

have more farm income than female headed households and that land size had a positive significance with household farm income which supports the hypothesis of a positive relationship between farm size and productivity. Therefore we can conclude that agricultural support had no impact on the income of the farmers but rather land size and gender were the most important for increased farm income.

7.2 Study limitations

This study was limited by sample size which is attributed to inadequate fund and time during the data collection. Although the findings presented in this paper are specific to the study area, they may contribute to a better general understanding of the issues concerning off-farm engagement and agricultural support of rural farm households. Therefore it should not be generalized to other regions of the world.

7.3 Suggestions for future research

For future research, it would be interesting to pursue further research on the various reasons for off-farm participation and their degree of importance as well as the reducing effects on poverty and inequality among rural farm households in the study region. In addition, more qualitative research should be carried out in order to figure out the various reasons for households' off-farm participation in the region. A larger sample size should be used during further research, so as to see more variability in the analysis results.

7.4 Policy recommendations

Rural development policies aimed at poverty reduction should focus equally on both the farm and off-farm sectors because off-farm activities have been increasing household income and providing money that is invested into agriculture for increased production. Farming as the only source of income has failed to guarantee sustainable livelihood for most farming households in developing countries. Sustainable livelihood, meaning the capability of people to make a living by coping with, recovering from and adapting to shocks and stresses and improve their material needs or conditions without putting other people's living options, either now or in the future in jeopardy (Isaac, 2009). Therefore agricultural development policies should focus not only on subsidies of fertilizer and seeds but also provide extension service workers who will teach these rural farmers how to use these inputs efficiently. The profitability of input use is sensitive to how

it is used. Application of appropriate policy programs that can serve both sectors is recommended.

In order to reduce the gender imbalance at the level of off-farm participation and farm income, a type of social policy that helps to give social support to women, especially female headed households (widows) should be implemented. Example of such social support could be financial support so that they can use it to support their farm production or open petty businesses. In addition, policies aimed at increasing the subsidy rate of female headed households should be implemented and encouraging female headed households to form widows' association for easy identification in order to get help.

BIBLIOGRAPHY

Adams, R.H. (1994). Non-farm income and inequality in rural Pakistan: A decomposition analysis. *Journal of Development studies*, 31 (1), 110–133.

Adepoju, A.O. & Obayelu, O. A. (2013). Livelihood diversification and welfare of rural households in Ondo State, Nigeria. *Journal of Development and Agricultural Economics*, 5(12), 482-489, December 2013.

Aderibigbe, Y. (2001). Resource Control: Looking beyond the Lure of Crude Oil. *The Guardian*, 8-9.

Agnes, R.Q. (1996). Male-female differences in agricultural productivity: Methodological issues and empirical evidence. *World Development*, 24,(10), 1579-1595,1996.

Ali, A., Erenstein, O. & Rahut, D.B. (2014). Gender contribution in production of high value crops: Empirical evidence from Pakistan. *The Journal of Animal & Plant Sciences*, 24(3), 2014, 936-944 ISSN: 1018-7081.

Alimba, J.O. (1995). Linkages between farm and non-farm sectors of the Nigerian rural economy. Rural development in Nigerian: Concepts, Processes and Projects. Eboh E.C., Okoye C.U. and Anyichi O. (eds), Enugu, Nigeria: *Auto century publishers company limited*, 31-41.

Amalu, U. (1998). Agricultural research and Ext delivery systems in Sub-Saharan Africa Calabar: UNICAL Pres Babatunde R.O, and Boluwade E.O. (2004). Resource use efficiency in food crop production in Ekiti state Nigeria. *Journal of Agric and Social Research*, 4(1), 105-117.

Andrew, D. (2009). Rethinking agricultural input subsidy programs in a changing World: Paper prepared for the Trade and Markets Division, Food and Agriculture Organization of the United Nations. *Center for development, employment and policy*.

Andrew, D. and Ephraim, C. (2011). The Malawi agricultural input subsidy programme: 2005/06 to 2008/09. *International Journal of Agricultural Sustainability*, 9(1), 232-247.

Andrew, D. (1999). Farm size and productivity in Malawian smallholder agriculture. *The Journal of Development Studies*, 35(5), 141-161, DOI: 10.1080/00220389908422595

Anriquez, G. & Daidone, S. (2010). Linkages between the farm and nonfarm sectors at the household level in rural Ghana: A Consistent stochastic distance function approach. *Agricultural Economics*, (41), 51–66.

Awudu, A. & Anna, C. (2001). Determinants of income diversification amongst rural households in Southern Mali. *Food Policy*, 26(4), August 2001, 437-452.

Babatunde, R.O. (2013). On-farm and off-farm works: Complements or substitutes? Evidence from rural Nigeria. *Contributed paper for the 4th International Conference of African Association of Agricultural Economists*, September 22–25, 2013, Hammamet, Tunisia.

Babatunde, R.O. & Qaim, M. (2009). Poverty and income inequality in rural Nigeria: *The role of off-farm income diversification*.

Babatunde, R.O. & Qaim, M. (2009). Patterns of income diversification in rural Nigeria: Determinants and impacts. *Quarterly Journal of International Agriculture*, 48(4), 305-320, 2009, DLG-Verlag Frankfurt/M.

Barrett, C. B., Reardon, T. and Webb, P. (2001). Nonfarm income diversification and household livelihood strategies in rural Africa: *Concepts, dynamics and policy implications*, *Food Policy*, (26), 315-331.

Beyene, AD. (2008). Determinants of off-farm participation decision of farm households in Ethiopia. *Agricultural Economics Research, Policy and Practice in Southern Africa*, 47(1), 140-161, 2008.

Bindlish, V., Evenson, R. and Gbetibou, M. (1993). Evaluation of T&V-based extension in Burkina Faso, *World Bank Technical Paper No. 226, Africa Technical Department Series* (Washington, DC: World Bank, 1993).

Bindlish, V. and Evenson, R. (1993). Evaluation of the performance of T&V extension in Kenya. *World Bank Technical Paper No. 208, Africa Technical Department Series* (Washington, DC: World Bank, 1993).

Bola, A.A., Taiwo, T.A., Aliou, D. & Vivian, T.O. (2011). Impact of access to subsidized certified improved rice seed on income: Evidence from rice farming households in Nigeria. *OIDA International Journal of Sustainable Development*, 2(12), 43-60, 2011.

Bryceson, D. (2000). *Rural Africa at the crossroads: Livelihood practices and policies*. Overseas Development Institute, London, England, 5-6.

Byerlee, D. (1998). Knowledge intensive crop management technologies: Concepts, impacts, and prospects in Asian Agriculture. In Pingali P. ed., *Impacts of rice research*. Bangkok: Thailand Development Research Institute; Los Baños, Philippines: *International Rice Research Institute*, 113-133

CBN. (2003). Contemporary Economic Policy Issues in Nigeria: *Central Bank of Nigeria*, Abuja, Nigeria.

CBN. (2011). Statistical Bulletin: Consultative Group to Assist the Poor (CGAP), (2009). Branchless Banking - Scenarios for 2020. *Volume 22, Central Bank of Nigeria, Abuja, Nigeria*. <http://technology.cgap.org/>

Consultative Group to Assist the Poor (CGAP), (2009). *Branchless Banking - Scenarios for 2020*. <http://technology.cgap.org/>.

Corpal, L and Reardon. (2001). Rural non-farm incomes in Nicaragua. *World Development*, 29(3), 427-441.

Crawford, E., Kelly, V., Jayne, T. S. & Howard, J. (2003). Input use and market development in Sub-Saharan Africa: *An overview. Food Policy* 28 (August), 277–292.

Crawford, E. W., Jayne, T. S. & Kelly, V. A. (2006). Alternative approaches for fertilizer use in Africa. *Agriculture and Rural Development Discussion Paper No. (22)*. Washington, D.C.: The World Bank.

Croppenstedt, A. (2006). Household income structure and determinants in rural Egypt. *Agriculture and Economic Development Analysis Division, Food and Agricultural Organization, Rome, Italy. ESA working paper No. 06-02*.

Davis, B., Winters, P., Carletto, G., Covarrubias, K., Quinones, E., Zezza A., Stamoulis, K., Bonomi, G. & Digiuseppe, S. (2007). Rural income generating activities: A cross country

comparison. ESA Working Paper No. 07-16, *Agricultural Development Economics Division, FAO, Rome, Italy*.

De Janvry, A., Sadoulet, E. & Zhu, N. (2001). The role of non-farm incomes in reducing rural poverty and inequality in China. *CUDARE Working Paper No. 1001*, Department of Agricultural and Resources Economics, University of California, Berkeley.

Deininger, K. & Olinto, P. (2001). Rural nonfarm employment and income diversification in Colombia. *World Development*, 29 (3), 455–465.

Deininger, K., Savastano, S. & Carletto, C. (2007). Land market development and agriculture efficiency in Albania. Paper presented at the 104th EAAE/IAAE Seminar Agricultural economics and transition: *What was Expected, what we observed, the lessons learned*. Corvinus University, Budapest, Hungary.

Demisie, D & Workneh, N. (2004). Determinants of rural livelihood diversification: Evidence from Southern Ethiopia, *Quarterly Journal of International Agriculture*, 43(3), 209-267.

De Janvry, A. & Sadoulet, E. (2001). Income strategies among rural households in Mexico: The role of off-farm activities. *World Development*, 29(3), 467-480.

Diagne, D.C., Adekambi, A.S.A., Simtowe, F.P. & Biao, G. (2009). The impact of agricultural technology adoption on poverty: The case of Nerica rice varieties in Benin. *A shorter version of the paper is being presented as contributed paper at the 27th Conference of the International Association of Agricultural Economists*, August 16-22, 2009. Beijing, China.

Eboh, E.C. (2002). Economic diversification, rural non-farm sector and poverty alleviation: Towards sustainable rural livelihoods in Nigeria, *Agricultural transformation in Nigeria*. Nwosu A.C., Nwajiuba C.U. and Mbanasor J.A. (Eds) proceedings of a National Conference in honour of Professor Martin O. Ijere, August, 24-26 Owerri: *Noverlty Industrial Enterprises Ltd.*, 3-12.

Eboh, E.C. & Ocheoha, K.N. (2002). Determinants of rural non-farm sector potential in reducing income poverty: Evidence from Enugu State Nigeria, agriculture: A basis for poverty eradication and conflict resolution, Iloeje M.N., Osuji G.E., Herbert U. and Asumugha G.N. (Eds), *proceedings of the 36th Annual Conference of the Agricultural society of Nigeria held at Federal University of Technology, Owerri, Nigeria*, October 20-24 ,160-164.

Ellis, F. (2000). The determinants of rural livelihood diversification in developing countries. *Journal of Agricultural Economics*, 51(2), 289-302,

Ellis, F. (1998). Household strategies and rural livelihood diversification. *Journal of Development Studies*, 35(1), 1–38 , 1998.

Ellis, F. & Freeman, H.A. (2004). Rural Livelihoods and Poverty Reduction Strategies in Four African Countries. *Journal of Development Studies*, 40(4), 1-30.

Ekpo, A. & Egwaikhide, F. (1994). Exports and Economic growth in Nigeria: A Reconsideration of the Evidence. *Journal of Economic Management* 1(1), December.

Esther, D., Michael, K. & Jonathan, R. (2008). How high are rates of return to fertilizer? Evidence from Field Experiments in Kenya. *Psychology and Development: Theory and Experimental Evidence. American Economic Review: Papers & Proceedings 2008*, 98(2), 482–488 <http://www.aeaweb.org/articles.php?doi=10.1257/aer.98.2.482>

Evanson, R.E. & Gollin, D. (2003). Assessing the impact of the Green Revolution, 1960 to 2000. *Science* 300 (2 May), 758–762.

Fabusoro, E. & Agbonlahor, M. (2002). Optimal farm plan and resource allocation for small rice-based farmers in Ogun State, Nigeria. *International Journal of Agricultural Sciences, Sciences, Environment and Technology (ASSET) Series A*, 2(2), 33–42.

Falusi, A.O. (1989). Fertilizer policy in the context of small holder Agricultural production in Nigeria Toward better harvest for rural farmers. *Proceedings of 1st National Fertilizer workshop held in Durbar Hotel, Kaduna, June. 5-7.*

Fan, S., Gulati, A. & Thorat, S. (2008). Investment, subsidies, and pro-poor growth in rural India. *Agricultural Economics* 39 (September), 163–170.

Federal Ministry of Agricultural and Rural Development (FMARD). (2000). *Nigeria rural development sector strategy main report*. Federal Ministry of Agriculture and Rural Development, Abuja.

Flores, I.M. (2004). Rural development and food security in West Africa. FAO Agric and Economic Development analysis division Esp. *Working Paper No. 04-02*.

Gautam, M. (2000). *Agricultural extension: The Kenya experience. An impact evaluation*. Washington, D.C: The World Bank.

Haggblade, S. (2005). The rural non farm economy. Pathway out of poverty or pathway in? *paper prepared for the IFPRI/ODI/Imperial College research workshop on the future of small farms*, Withersdane Conference Center, Wye, Kent, Uk 26-29 June 2005.

Haggblade, S., Hazell, P. & Reardon, T. (2007). *Transforming the rural non-farm economy*. John Hopkins University Press Baltimore.

Ibekwe, U.C., Eze C.C., Ohajianya, D.O., Orebiyi, J.S., Onyemauwa, C.S. & Korie, O.C. (2010). Determinants of non-farm income among farm households in South East Nigeria. *Researcher, Academia Arena*, 2(7), 1-4.

Ibekwe, U.C. (2010). Income distribution among farm households in Orlu Agricultural Zone of Imo State: Unpublished Ph.D thesis, Department of Agricultural Economics, University of Nigeria Nsukka. *Report and Opinion*, 2(8), 2010.

Iheke, O.R. & Oliver-Abali, V.I. (2011). Farm size, climate variability and arable crop production in Abia State Nigeria. *International Journal of sustainable agriculture*, 3(2), 58-64, 2011.

Isaac, B. O. (2009). Poverty and income diversification among households in rural Nigeria: *A gender analysis of livelihood patterns*. The 2nd Instituto de Estudos Sociais e Económicos (IESE) Conference on Dynamics of Poverty and Patterns of Economic Accumulation in Mozambique.

Jayne, T. S., Govereh, J., Wanzala, M. & Demeke, M. (2003). Fertilizer market development: A comparative analysis of Ethiopia, Kenya, and Zambia. *Food Policy* 28 (August), 293–316.

- Javier, E. (2001). The determinants of nonfarm income diversification in rural Peru. *World development*, 29 (3), 497-508.
- Jolliffe, D. (2004). The impact of education in rural Ghana: Examining household labour allocation and returns on and off the farm. *Journal of Development Economics*, 73(1), 287-314.
- Joshi, P. K., Gulati, A., Birthal, P. S. & Twari, L. (2003). Agricultural diversification in South Asia: Patterns, determinants, and policy implications. Discussion Paper No. 57. Markets and Structural Studies Division. *International Food Policy Research Institute. Washington, D.C Vol. 39 (24)*, 2457-2467, Jun. 12-18, 2004,.
- Julian, Q. (2006). Land access in the 21st century: Issues, trends, linkages and policy options. *LSP Working Paper 24*.
- Jutzi, S.C., Haque, I., McIntire, J. & Stares, J.E.S. (eds). (1988). Management of Vertisols in sub-Saharan Africa. *Proceedings of a conference held at ILCA, Addis Ababa, Ethiopia, 31 August-4 September 1987*. ILCA, Addis Ababa.
- Kilic, T., Carletto, C., Miluka, J. & Savastano, S. (2009). Rural nonfarm income and its impact on agriculture: Evidence from Albania. *The international Journal Association of Agricultural Economist*, 40(2), 139-160, March 2009.
- Kijima, Y., Matsumoto, T., & Yamano, T. (2006). Nonfarm employment, agricultural shocks, and poverty dynamics: evidence from rural Uganda. *Agricultural Economics*, 35 (Supplement s3), 459–467. KWSG, (2006). Kwara state government of Nigeria, planning studies in Kwara state. Ministry of land and regional planning, Ilorin. *The international Journal Association of Agricultural Economist*, 35, 459–467, November 2006.
- Kutengule, M. (2000). Farm and non-farm sources of income: Rural livelihood diversification in Malawi. Ph.D. *Thesis, School of Development Studies, University of East Anglia, UK*. 350.
- Lanjouw, P. (1999). Rural non-agricultural employment and poverty in Ecuador economic development and cultural change; *Economic Development and Cultural Change*, 48(1), 91-122, October 1999.

- Lanjouw, J.O., & Lanjouw, P. (2001). The rural non-farm sector: Issues and evidence from developing countries. *The Journal of the International Association of Agricultural Economists*, 26 (1), 1–23, October 2001.
- Lipton, M. (1993). Land reform as commenced business: *The evidence against stopping*, *World Development*, Volume 21, 641-57.
- Lipton, M. (1996). Rural reforms and rural livelihoods: *The contexts of international experience*, in M. Lipton, M. de Klerk, and M. Litpon, *Land, Labour and Livelihoods in Rural South Africa*, Durban: Indicator Press.
- Liverpool-Taise, L.S., Kuku, O. & Ajibola, A. (2011). A review of literature on agricultural productivity, social capital and food security in Nigeria, *IFPRINSSP Working Paper No. 21*, October 2011.
- Mathenge, M.K. & Tschirley, D.L. (2009). Off-farm work and farm production decisions: Evidence from maize producing households in Rural Kenya. *Tegemeo Institute of Agricultural Policy and Development*, Working Paper No. WPS33/2008.
- Matsumoto, T., Kijima, Y. & Yamano, T. (2006). The role of local nonfarm activities and migration in reducing poverty: evidence from Ethiopia, Kenya, and Uganda. *The Journal of the International Association of Agricultural Economics*. 35 (Supplement s3), 449–458, November 2006.
- Meagher, K. (1999). If the Drumming Changes, the Dance also Changes: Deagrarianization and Rural Non-farm Employment in the Nigerian Savannah. *Africa Study Centre Working Paper 40*. Leiden.
- Mellor, J.W. (1976). *The new economics of growth: A strategy for India and the developing world*. Cornell University Press, New York, ISBN 9780801 409998, 335.
- Minot, N., Epprecht, M., Anh, T.T.T. & Trung, L.Q. (2006). *Income diversification and poverty in the Northern upland of Vietnam*. Research Report No. 145, International Food Policy Research Institute, Washington, DC.
- Byerlee, D., Kelly, V.A., Kopicki, R.J. & Morris, M. (2007). *Fertilizer use in African agriculture: Lessons learned and good practice guidelines*. Washington, D.C.: The World Bank.

MOLSA. (1997). Agricultural wage employment and rural non-farm employment in Ethiopia: survey results. Addis Ababa: *MOLSA*.

Morris, M.L., Tripp, R. and Dankyi, A.A. (1999). Adoption and Impacts of Improved Maize Production Technology: A Case Study of the Ghana Grains Development Project. *Economics Program Paper 99- 01*. Mexico, D.F.: CIMMYT.

Nwaru, J.C. (2005). *Determinants of farm and off-farm incomes and savings of food crop farmers in Imo State, Nigeria: Implications for poverty alleviation*. *Niger Agricultural Journal*, (36), 26-42.

Ogen, O. (2007). The Agricultural Sector and Nigeria's Development: *Comparative Perspectives from the Brazilian Agro-Industrial Economy, 1960-1995*. *Nebula*, 4(1), 184-194.

Okojie, C., Monye-Emina, A., Eghafona, K., Osaghae, G. and Ehiakhamen, J.O. (2010). Institutional environment and access to microfinance by self-employed women in the rural areas of Edo State. NSSP Brief No. 14. Washington. D.C.: *International Food Policy Research Institute*. Nigeria Strategy Support Program (NSSP) Background Paper No. NSSP 003

Oni, T.O. (2007). *Supply Response of Traditional and Non-Traditional Agricultural Export Commodities to Macroeconomic Policies in Nigeria*. Unpublished Ph. D Thesis, Department of Agricultural Economics, University of Ibadan, Nigeria.

Oni, T.O. (2013). Challenges and Prospects of Agriculture in Nigeria: The Way Forward. *Journal of Economics and Sustainable Development*. ISSN 2222-1700 (Paper) ISSN 2222-2855 (Online), 4(16), 2013.

OPM. (2004). *Oxford Policy Management, DFID Rural and Urban Development Case Study – Nigeria*. June 2004.

Oriola, E.O. (2009). A framework for food security and poverty reduction in Nigeria. *European Journal of Social Sciences* –8(1), 2009.

Oseni, G. & Winters, P. (2009). Rural nonfarm activities and agricultural crop production in Nigeria. *Agricultural Economics*, 40(2), 189-201.

- Oyejide, T.A. (1998). Trade Policy and regional integration in the development context. Emerging patterns, issues and lesson for sub-Saharan Africa. *Journal of Economics 7 supplement*, 108-125, 9 June, 1998.
- Parasada, R.M. (2002). The determinants of rural off-farm employment in two villages of Andhra Pradesh (India). *Poverty Research Unit, University of Sussex*.
- Pfeiffer, L., López-Feldman, A. & Taylor, J.E. (2009). Is off-farm income reforming the farm? Evidence from Mexico. *Agricultural Economics*, 40(2), 125-138.
- Phillip, D., Nkonya, E., Pender, J. & Oni, O.A. (2009). Constraints to increasing agric productivity in Nigeria: A Review. *IFPRI-NSSP Background Paper No. 6*.
- Rahman, S.A. (2008). Women's involvement in agriculture in northern and southern Kaduna State. *Journal of Gender Studies*, (17), 17-26.
- Reardon, T., Delgado C. & Matlon, P. (1992). Determinants and effects of income diversification amongst farm households in Burkina Faso. *Journal of Development Studies*, 28 (2), 264–296.
- Reardon, T. (1997). Using evidence of household income diversification to inform study of the rural non farm labour market in Africa. *World Development*, 25 (5), 735-748.
- Ruben, R. & Van Den Berg, M. (2001). Non-farm employment and poverty alleviation of rural farm households in Honduras. *World Development*, 29(3), 549-560.
- Senadza, B. (2011). Non-farm income diversification in rural Ghana: *Determinants and implications for income distribution and welfare*. Verlag Dr. Muller, Saarbrucken
- Speirs, M. & Olsen, O. (1992). Indigenous integrated farming system in Sahel. *World Bank Technical Paper No. 179, African Technical Department Series*. World Bank, Washington, DC.
- Stampini, M. & Davis, B. (2009). Does non-agricultural labour relax farmers' credit constraints? Evidence from longitudinal data for Vietnam. *Agricultural Economics*, 40(2), 177–188.

Tiziana, L., Ernestina, C. & Sara, R. (2010). Did you sleep here last night? The impact of the household definition in sample surveys: a Tanzanian case study. In: *European Population Conference*, 3-5 September 2010, Vienna.

Toulmin, C. & Quan, J.F. (2000). *Evolving land rights, policy and tenure in Africa*. DFID/IIED/NRI March 2000, 336.

Van den Berg, M.& Kumbi, G.E. (2006). Poverty and the rural non-farm economy in Oromia, Ethiopia. *Agricultural Economics*. 35 (Supplement), 469–475.

World Bank. (2003). *Nigeria: Women in agriculture, In: Sharing experiences—examples of participating approaches*. The World Bank Group. The World Bank Participating Sourcebook, Washington, D.C. <http://www.worldbank.org/wbi/publications.html>.

Woldenhanna, T. & Oskam, A. (2001). Income diversification and entry barriers: Evidence from the Tigray region of northern Ethiopia. *Food Policy* 26 (4), 351–365.

Zerihun, B.W. (Undated). Determinants of Nonfarm Income Diversification in Rural Ethiopia: Evidence from Panel data.

<http://www.abiastate.gov.ng/state-profile/profile/agriculture/> (website visited on: 23rd of May 2015).

Source: Margaret Grosh and Paul Glewwe, (2000). Designing household questionnaire for developing countries: lessons from 15 years of the living standard measurement study volume 3.

SECTION A: HOUSEHOLD CHARACTERISTICS

1. code	2. List all the names of individuals in the household (List household head first, only first names)	3. What is the relationship ofto household head?	4. sex Male=1 Female=0	5. Age in yrs(from last birthday)	6. What is the highest level of education of??	7. Is..... currently going to school? Yes=1 No=0	8. If No, what is the reason for not going to school?	9.Is.....currently working for cash or in-kind income? Yes=1 No=0	10.If is not currently working and has not worked for the past one month what is the reason?	11. What type of school do your children attend? Private =1 Public =0
Code	Name	Code	0-1	Years	Code	0-1	Code	0-1	Code	0-1
AA.		AA1	AA2	AA3	AA4	AA5	AA6	AA7	AA8	AA9
AB.		AB1	AB2	AB3	AB4	AB5	AB6	AB7	AB8	AB9
AC.		AC1	AC2	AC3	AC4	AC5	AC6	AC7	AC8	AC9
AD.		AD1	AD2	AD3	AD4	AD5	AD6	AD7	AD8	AD9
AE.		AE1	AE2	AE3	AE4	AE5	AE6	AE7	AE8	AE9
AF.		AF1	AF2	AF3	AF4	AF5	AF6	AF7	AF8	AF9
AG.		AG1	AG2	AG3	AG4	AG5	AG6	AG7	AG8	AG9
AH.		AH1	AH2	AH3	AH4	AH5	AH6	AH7	AH8	AH9
AI.		AI1	AI2	AI3	AI4	AI5	AI6	AI7	AI8	AI9
AJ.		AJ1	AJ2	AJ3	AJ4	AJ5	AJ6	AJ7	AJ8	AJ9
AK.		AK1	AK2	AK3	AK4	AK5	AK6	AK7	AK8	AK9
AL.		AL1	AL2	AL3	AL4	AL5	AL6	AL7	AL8	AL9
AM.		AM1	AM2	AM3	AM4	AM5	AM6	AM7	AM8	AM9
AN.		AN1	AN2	AN3	AN4	AN5	AN6	AN7	AN8	AN9

Codes for question 3	Codes for question 6	Codes for question 8	Codes for question 10
01=head 02=wife 03=child 04=grandchild 05=niece/nephew/cousin 06=mother/father 07=sister 08=brother 09=uncle/aunt 10=son/daughter in-law 11=father/mother in-law 12= grandfather/grand mother 13=brother/sister in-law 14=house help 15=other non family member	01=nursery school 02= primary education 03=junior secondary education(3yrs) 04=senior secondary education(3yrs) 05=university education(4yrs) 06=vocational education 07=no schooling 08= grade1 teacher training college 09=grade2 teacher training college	01= inadequate money 02=to support in farming and other errands at home 03=far school distance 04=gender issues 05=deformity/sickness 06=lack of priority to education by the household head 07=has finished schooling 08= other reasons	01= schooling 02= has no job 03= lack skills and qualification to find a job 04= retired from work 05= sickness, disabled or handicapped. 06=too old or too young 07= difficult to find a job 08= contract work 09=has found a job but not yet resumed 10= nursing mother 11= other

SECTIONB: LAND TENURE AND FARM CHARACTERISTICS

In this section we would like to have some information about your household’s land size and ownership. **Yes =1, No=0**

B1. Do you own land ?

1=Yes 0= No

B2. Do you farm on the land you own?

1= Yes 0= No

B3. Do you farm on another person’s land?

1= Yes 0= No

B4. If Yes ,what is the arrangement type?

- 1. Pledge
- 2. Rent
- 3. Sharecropping
- 4. Owner
- 5. All of the above

For the next two questions, if the respondent cannot say how many hectares he has, think of a plot of land which is about one-third of a hectare. Determine how many plots of land that the respondent has that would cover a hectare of land. Lands are measured in Plots in the southern Nigeria.

Note:

- 1. One plot of land is about one-third of a hectare
- 2. One hectare is approximately equal to 2 acres

B5. What is the total size of the farm land owned by the household in hectares(ha)?

B6. What is the total size of the farm land rented by the household in hectares(ha)?

B7. Out of your total farm land(rented and owned), what is the farm size area cultivated by household(ha)?

SECTION C: HOUSEHOLD AGRICULTURAL PRODUCTION

In this question, we would want to know the crops that the household cultivates, sells and the home consumption of these crops. Field worker, ask about the crops that the household cultivated for the past one year(July 2013 to July 2014).

Which agricultural products do the household cultivate?. Field worker, if the answer to question 2 is NO, please do not ask the rest of the questions.

1.Names of agricultural produce	2.Did your household cultivate any of these agricultural products for the past one year?	3.what is the unit(s) of measurement?	4.How much of [crops] were harvested for the past one year?	5.How much of [crops] were sold for the past one year?		6.How much unit of [crops] were consumed by the household for the past one year?
Name	Yes=1 /No=0	code	Unit	Unit	Average price	Unit
CROPS						
CA . Yam	CA1	CA2	CA3	CA4	CA5	CA6
CB. Cassava	CB1	CB2	CB3	CB4	CB5	CB6
CC. Maize	CC1	CC2	CC3	CC4	CC5	CC6
CD. Three leaved yam	CD1	CD2	CD3	CD4	CD5	CD6
VEGETABLES						
CE. Okra	CE1	CE2	CE3	CE4	CE5	CE6
CF. Melon	CF1	CF2	CF3	CF4	CF5	CF6
CG. Fluted pumpkin	CG1	CG2	CG3	CG4	CG5	CG6
CH. Ugboro	CH1	CH2	CH3	CH4	CH5	CH6
CI. Pepper	CI1	CI2	CI3	CI4	CI5	CI6
CJ. Garden egg	CJ1	CJ2	CJ3	CJ4	CJ5	CJ6
CK. Others (specify)	CK1	CK2	CK3	CK4	CK5	CK6
Total income						

Units of measurement				
01. heaps	03. per piece	05. boxes	07. buckets	09. heads
02. bundles	04. baskets	06. basins	08. bags	10. others

SECTION D: FRUIT PRODUCTION: We would want to know here the fruits that the household cultivates, sells and their home consumption of these fruits they cultivate. Field worker, ask about the fruits that the household cultivated for the past one year. **Yes =1, No =0.** Field worker, if the answer to question 2 is NO, please do not ask the rest of the questions.

1.Names of fruits	2. Did your household cultivate any of these fruit for the past one year?	3.what is the unit(s) of measurement?	4.How much of [fruits] were harvested in the pat one year?	5.How much of [fruits] were sold for the past one year ?		6.How much unit of [fruits] were consumed by the household for the past one year?
Name	Yes=1/No=0	code	Unit	Unit	Average price per unit	Unit
DA. Orange	DA1	DA2	DA3	DA4	DA5	DA6
DB. Pear	DB1	DB2	DB3	DB4	DB5	DB6
DC. Paw-paw	DC1	DC2	DC3	DC4	DC5	DC6
DD. Tangerine	DD1	DD2	DD3	DD4	DD5	DD6
DE. Mango	DE1	DE2	DE3	DE4	DE5	DE6
DF. Avocado pear	DF1	DF2	DF3	DF4	DF5	DF6
DG. Coconut	DG1	DG2	DG3	DG4	DG5	DG6
DH. Pineapple	DH1	DH2	DH3	DH4	DH5	DH6
DI. Banana	DI1	DI2	DI3	DI4	DI5	DI6
DJ. others	DJ1	DJ2	DJ3	DJ4	DJ5	DJ6
Total income						

SECTION E : LIVESTOCK HOLDINGS

We would like to know if your household owns livestock, how many that was sold and how many that was eaten. Also we would like to know how many that is alive at the moment. The past one year, I mean July 2013 to July 2014.

Does the household have livestock?

Field worker, if the answer to question 2 is NO, please do not ask the rest of the questions.

1.Names of livestock	2.Does your household have Any of these livestock?	3.How many livestock do you have presently ?	4.Have many livestock have your household sold in the past 1 year?		5.Have many livestock have your household eaten in the past 6 months?	6.How many livestock died or were lost in the past 1 year?
Names	Yes =1/No =0	Number	Number	Average price per livestock	Number	Number
EA. Adult Cattle	EA1	EA2	EA3	EA4	EA5	EA6
EB. Sheep	EB1	EB2	EB3	EB4	EB5	EB6
EC. Goat	EC1	EC2	EC3	EC4	EC5	EC6
ED. Chicken	ED1	ED2	ED3	ED4	ED5	ED6
EE. Turkey	EE1	EE2	EE3	EE4	EE5	EE6
EF. Pig	EF1	EF2	EF3	EF4	EF5	EF6
EG. Calves	EG1	EG2	EG3	EG4	EG5	EG6
EH. Others						
Total income						

SECTION F: OFF-FARM INCOME GENERATING ACTIVITIES OF THE HOUSEHOLD.

Does your household engage in off-farm activities? We would like to know about the off-farm activities that the household engages in, how much time spent on off-farm activities, who in the household engages in off-farm and how much income is generated from off-farm.

1. Who in the household engages in off-farm activities? Refer to the first table and write down names of those among the household that engage in off-farm activities . Only first names.	2. Which types of off-farm activities does your household engage in?	3. How many hours on average does....likely spend per week on off-farm activities?	4. How many days on average does..... likely spend per month on off-farm activities?	5. Which months do you engage in off farm?	6. How much money do you earn per month from off-farm?	7. How much money do you earn per year from off-farm?	8. What are the reasons for engaging in off-farm activities?
Codes	Codes	Hours	Number	Months	Naira		Codes
FA	FA1	FA2	FA3	FA4	FA5	FA6	FA7
FB	FB1	FB2	FB3	FB4	FB5	FB6	FB7
FC	FC1	FC2	FC3	FC4	FC5	FC6	FC7
FD	FD1	FD2	FD3	FD4	FD5	FD6	FD7
FE	FE1	FE2	FE3	FE4	FE5	FE6	FE7
FF	FF1	FF2	FF3	FF4	FF5	FF6	FF7
FG	FG1	FG2	FG3	FG4	FG5	FG6	FG7
FH	FH1	FH2	GH3	FH4	FH5	GH6	GH7
FI	FI1	FI2	FI3	FI4	FI5	FI6	FI7

Codes for question 2		Codes for question 7
01= family shop	02= farm labourer	01. To have more money for food consumption
03= palm wine tapping	04= brick laying	02. To have more money for education
05= bicycle repairing	06= cobbler	03. To have more money for health
07= carpentry work	08= palm fruit cutting	04. To invest more money in agriculture
09= hair making	10= food hawking	05. Because you have many adult children to work for you on your farm
11= Traditional medicine	12= House painting	06. Because your farm size is small (you need more money/more time)
13= mason	14= trading	07. To have more money for personal use
15=others		08. Younger age of household head
		09. All of the above
		10. others

SECTION G: OVERALL HOUSEHOLD SOURCES OF INCOME

Here, we would like to know all the sources of the household's income. Field worker, if the answer to question 1 is NO, please do not ask the rest of the questions.

Which other sources of income does the household have?

1. Which other source of income does the household have?		2. Who generates this income?	3. How much is this money in a year (July 2013 to July 2014)?
Codes/sources of income	Yes=1/No=0	Codes/names	Naira
GA. Agro-processing	GA1	GA2	GA3
GB. Remittances (money from people outside the home)	GB1	GB2	GB3
GC. Pension	GC1	GC2	GC3
GD. Small Family business	GD1	GD2	GD3
GE. Gift	GE1	GE2	GE3
GF. Others	GF1	GF2	GF3

SECTION H: HOUSEHOLD EXPENSES. We would like to know what expenses the household make for different needs.

Which are the households needs that you cater for and how much is spent on these items? Field worker write 0 if the respondent did not spend anything on any group of items.

Household food expenditure		1.How much money have you spent on these items for the past one month? Naira	2. How much money have you spent on these items for the past one year? Naira	Household non-food expenditure		3. How much money have you spent on these items for the past one year (July 2013 to July 2014)? Naira
HA	Carbohydrates(rice, garri, yam, bread etc)	HA1	HA2	HK	Health care	HK1
HB	Protein(beans, fish, beef, chichen, milk , pap etc)	HB1	HB2	HL	Education expenses	HL1
HC	Vegetables(onion, tomatoes, ukazi, bitter leaf, okro, fluted pumpkin, etc)	HC1	HC2	HM	Water	HM1
HD	Fats and oil(vegetable oil, palm oil, etc)	HD1	HD2	HN	Electricity(bulbs, bills etc.)	HN1
HE	Beverages (tea, chocolate, etc)	HE1	HE2	HO	Personal items(clothes, shoes, lotion,soap etc)	HO1
HF	Sugar, salt	HF1	HF2	HP	Household rapairs and maintenance	HP1
HG	Alcoholic drinks(Beers, schnapps, palm wine	HF1	HF2	HQ	Depts and money contributions(savings)	HQ1
HH	Soft drinks(coca-cola, fanta, sprite etc)	HH1	HH2	HR	Celebrations and funerals	HR1
HI	Fruits(banana, orange etc)	HI1	HI2	HS	Transporting produce to the market	HS1
HJ	Others	HJ1	HJ2	HQT	Agricultural production	HT1
				HU	Large items(e.g, furniture, radio, bicycle/motocycle etc.)	HU1
				HV	Others	HV1

SECTION I: SUPPORT SERVICES

We would like to know if the household has any form of support that helps in improving farm productivity. **Yes=1, No=0**

IA. Do you receive any form of support or subsidy for farming? Yes No

IB. Do you receive support because you a member of an organization or cooperative society? Yes No

IC. Do you receive any credit for farming? Yes No

ID. If Yes, how much money in Naira?

IE. Do you receive support from extension services for farming? Yes No

IF. Do you receive support from agricultural input for farming? Yes No

IG. If Yes, which agricultural input(s) do you receive? Please specify below

IG1. Fertilizer Yes No

IG2. Seeds Yes No

IG3 others (Specify)

IH. Do you receive no support at all for farming? Yes No

II. Does the support increase your income? Yes No

SECTION J: HOUSEHOLD FOOD CONSUMPTION

We would want to know the consumption pattern of the household. Households should answer all the questions in this section based on the past 7 days. **Yes = 1, No = 0**

	Food group	Examples	1.Ate it yesterday?	2.How many days were the foods consumed in the past 7 days?	3.Main source of food
		Names of food items	Yes=1/No=0	Number	Code
JA	Maize or maize products	Maize cake, corn mill, maize, pap etc	JA1	JA2	JA3
JB	Other cereals	Wheat, bread, rice, breakfast cereals(cornflakes, golden morn etc.), oats, pasta, indomie etc.	JB1	JB2	JB3
JC	Roots and tubers	Sweet potatoes, Irish potatoes, yam, cassava, three-leaved yam, coco-yam etc.	JC1	JC2	JC3
JD	Vitamin A- rich Fruits and Vegetables	Yellow/ orange coloured fruit and vegetables: mango, carrot, paw-paw etc. Dark-green leafy vegetable: fluted pumpkin, bitter leaf, Ugboro, uha, waterleaf, green etc.	JD1	JD2	JD3
JE	Other vegetables	Cucumber, cabbage, water melon, onion, mushrooms, tomatoes, green beans, green pepper, fresh pepper etc.	JE1	JE2	JE3
JF	Other fruits	Apples, banana, grapes, guava, pear, avocado pear, lime, orange, wild fruits etc	JF1	JF2	JF3
JG	Red meat	Beef and offal alone or as part of stew or soup	JG1	JG2	JG3
		Mutton, goat, lamb alone or as part of stew or soup			
		Wild meats including rabbits, birds and offal alone or as part of stew or soup			
JH	Consumption	How often do you eat red meat(beef, lamb, goat) Not as part of a stew o soup?	JH1	JH2	JH3
JI	Poultry	Chicken, duck and offal(giblets)	JI1	JI2	HI3
JJ	Other meat	Insects (edible maggots, Ntekuru, etc)	JJ1	JJ2	JJ3
JK	Fish	Frozen, fresh, canned fish	JK1	JK2	JK3
JL	Eggs	Eggs	JL1	JL2	JL3
JM	Legumes, nuts and seeds	Beans, groundnuts,	JM1	JM2	JM3
JN	Dairy	Liquid milk, condensed milk, powdered milk, yoghurt,	JN1	JN2	JN3
JO	Oil and fats	Any food made with oil(vegetable oil, palm oil), butter or margarine,	JO1	JO2	JO3
JP	Sugars	Sugars, sweets, honey, sugarcane,	JP1	JP2	JP3
JQ	beverages	Beer, fruit juice, soft drinks, tea , coffee, palm wine,	JQ1	JQ2	JQ3

Codes for question 4	
1= Own production	4= Gifts
2= Purchase	5= Gathering
3= Hunting	6= Others

SECTION K: WATER USE PRACTICES

Now I will like to know how and where the household gets water to use. Also how much that is spent on buying water. (fields worker, please check the list of water sources below). **Yes = 1, No = 0**

KA. Does your household buy water? Yes No

KB. If No, how do you get the water?

KB1. Government borehole Yes No

KB5. Rain water Yes No

KB2. Own bore hole Yes No

KB6. Water from well Yes No

KB3. Stream Yes No

KB7. All of the above Yes No

KB4. Free water from friend’s borehole Yes No

SECTION L: HOUSEHOLD MODE OF TRANSPORTATION

We would like to get some information on what the household uses in their movements. **Yes = 1, No = 0**

LA. Do you have any difficulty in taking your agricultural products to the market ?

Yes No

LB. Which of the following mode of transportation do you have access to ?

LB1= bicycle LB2= car LB3= public transport LB4=foot

LB5= all of the above

SECTION M: HOUSING

MA. What kind of house does your household live in?

MA1= block house with zinc roof

MA2= block house with thatch roof

MA3= mud house

MA4=others (specify).....

MB. How many bedrooms are there in the house?

MC. Do you own or rent the house you live in? Yes No

MD. If you have the resources would you like to build a more beautiful house? Yes No

SECTION N: OFF-FARM IMPORTANCE

NA. How do you perceive the need to go in off-farm jobs?

1= Totally not important 2= Not important 3= Neutral 4= Important
5= Very important

NB. Is engaging in off-farm activities important to contribute to household income? Yes No

NC. Is engaging in off-farm activities important to complement farming activities? Yes No

ND. Is engaging in off-farm activities important to complement access to food? Yes No

NE. Is engaging in off-farm activities important to pay for large expenditure in the household
e.g. school fees, buying a motorcycle

Yes No

NF. Is engaging in off-farm activities important for your own entrepreneurship? Yes No

NG. If you have more support from the government for farming and your farm production increases as a result, do you think that you will still go into off-farm job?

THANK YOU FOR YOUR COOPERATION