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Perspectives on Livelihood Strategies of Urban Farmers in Nigeria: Empirical Evidence from South- South Region

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In the past few decades policy makers and donor agencies have been focusing their poverty reduction strategies in the rural areas of the developing countries but with little progress. Available statistics indicates that Sub- Saharan Africa has the highest percentage of population of hungry people in the world. Also, Nigeria has over 12 million people in a state of hunger and this can trigger vulnerability to even the slightest shocks to food supply. There is every indication that rapid urbanization in developing countries particularly in Nigeria increases poverty. As such, urban dwellers in many developing countries have adopted many coping strategies. This paper, aimed to examine the factors influencing choice of livelihood strategies by urban farmers in Nigeria as response to rapid urbanization. The study used multistage sampling procedure to select 289 urban farm households in South-South Nigeria. Primary data were collected through surveys to achieve this. Data analysis was done using descriptive statistics and multinomial logit model. Results showed that socio-economic characteristics such as farm size ($p < 0.01$), gender ($p < 0.01$) and farming experience ($p < 0.05$) are the key variables influencing farmers' choice of agricultural wage employment, while age of household heads ($p < 0.05$) and years of formal education significantly influenced choice of non-agricultural wage employment category. This implies that experienced female farmers, who had access to farm land, adopted agricultural wage employment as their dominant livelihood strategy, while aged and educated male farmers chose non- agricultural income livelihood strategy. Capacity building, social and institutional support aimed at increasing household assets as well as promoting urban farming in Nigeria are recommended.

Key Words: Livelihood strategies, Multinomial logit regression, Poverty reduction, Urbanization, Nigeria

Background Information

The world has since been rapidly urbanizing, with more than halve of the world now living in urban areas. The expectation is that by 2050, two-thirds of the world population will be living in urban areas, with urban population continuously outgrowing the rural. According to United Nation Habitat, cities in developing countries will absorb ninety five percent of urban growth in the next two decades (UN Habitat, 2015). However, urbanization rate in Africa will be growing 1.8 times faster than the global population between 2015 and 2020. Consequently, feeding the growing population in urban areas, especially in developing countries is a big challenge (Tacolli, 2012).

Sub- Saharan Africa has the highest percentage of population of hungry people in the world, one person in four is undernourished (FAO, 2015). Notably, Nigeria the most populous nation in Africa is urbanizing at about 4.66 % per annum (CIA, 2016). Also, available statistics indicate that Nigeria has over 12 million people in a state of hunger and this can trigger vulnerability to even the slightest shocks to food supply (FAO, 2016). Further, the National Bureau of Statistics reported that 60.9% of Nigerians in 2010 were living in "absolute poverty" this figure raised from 54.7% in 2004 indicating an increase in rate of poverty. This is basically due to high rate of unemployment in the country, estimated at 12.1% of economically active population (NBS, 2016).

Further, the drop in Nigeria's oil prices, government policies and programmes has combined to erode the purchasing power of the average Nigerian, impacting negatively on their livelihoods. The national currency has systematically been devalued, subsidies on fuel have been removed and taxes and tariffs on basic amenities such as electricity have increased upward. Both public and private sectors have laid off some of their employees in a bid to reduce operational costs.

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This scenario has cause steep increases in food prices in both urban and rural areas of the country, hence, having profound effects on the vast majority of urban residents (Cohen and Garret, 2010) since they rely primarily on purchases rather than production. As the urban environment is cash driven, low incomes are likely to propel poor households into food insecurity, and vulnerable situations (Okon, 2014). The poor urban households struggle to ensure food security by adopting different coping strategies. However, the contribution made by these coping strategies to urban households' livelihoods has often been ignored by policy makers and donor agencies that have chosen to focus their poverty reduction activities on the rural areas of the country. Rakodi, (1995), observed that the major response at the household level to economic crisis is the diversification of income sources, but the scope for such diversification varies between households, which have different degrees of resilience and vulnerability. Potts (1997) distinguished two major coping strategies of urban households: multiple cash incomes and urban agriculture (UA – which is simply the growing of crops and rearing of animals within and around cities (RUAF, 2007). In Nigeria, for instance urban agriculture (UA) constitutes a significant source of livelihoods, especially for the urban poor, since more than 30% of their household income originates from this activity (Zezza and Tasciotti, 2010). Even though urban agriculture is one of the main sources of livelihood of most urban poor households in Nigeria, urban agriculture has not been recognized as an activity that has the potential of creating employment, reducing poverty and food insecurity among those practicing it. In addition, the transformative potential of urban agriculture and other non-agricultural livelihood options of urban households have not been explored in Nigeria. Thus, a thorough understanding of alternative livelihood strategies of urban farm households is indispensable to attaining the sustainable development goals. However, despite a plethora of studies that farm households' participation in different economic activities (Ellis, 2000; Abdulai and CroleRees, 2001; Eneyew, 2012; Bartolini, Andreoli and Brunori, 2014; Hassink, Agricola and Thissen, 2016), plays important role in reducing poverty and food insecurity in rural areas of both developed and developing countries, empirical evidence in urban areas remain scant. This study, therefore, aims to address this information gap by investigating the livelihood assets available to the urban farmers as well as factors influencing urban farm households' choice of different livelihood strategies as a response to poverty reduction in urban areas of South-South Nigeria.

Literature Review

Farm households diversify their livelihood activities to generate income and better cope with adverse factors and events that affect agriculture (Ellis, 2000; Ellis and Freeman, 2004). The strategies households adopt when choosing among livelihood options are determined by a range of socio-economic factors as well as their asset endowment (Eneyew, 2012). These strategies are discussed in relation to sustainable livelihood approaches. The term 'sustainable livelihood approaches' gained prominence through the Brundtland Report of the World Commission on Environment and Development in 1990s (Bennett, 2010). These include Oxfam, Care International, Canadian International Development Agency and the United Nations Development Programme (UNDP), among others. Although their emphases are different, they share the same basic concern that poverty should be tackled from the viewpoint of the poor. Scoones, (2009), articulate that sustainable livelihood approaches (SLAs) emanated due to increased attention to poverty reduction, people oriented approaches to development theory/practiced and sustainability in political arena.

The SLAs centers on both people and their livelihood; prioritizing both the tangible and intangible assets they utilize to achieve their goals. Chambers and Conway (1992), defined livelihoods as comprising capabilities, assets (both materials and social resources) and activities required for a means of living. A livelihood is considered to be sustainable when it can cope with and recover from stress and shock, maintain or enhance its capabilities and assets and provide sustainable livelihood opportunities for future generation. Given that assets are both destroyed and created in the process of urbanization. As evidenced in the constraints and opportunities that urbanization presents including lost of farm land and other productive assets, access to urban market and urban wage employment opportunities. These factors directly constrained or enhanced households' asset status, resulting in households dwelling on diverse activities for survival.

Rakodi (2002), highlighted that the sustainable livelihood approach recognizes that the poor may not have cash or other savings, but they have other material or non-material assets, such as their health, labor, their knowledge and skills, their kinship ties and friends, as well as the natural resources around them. The poor's assets (natural capital, social capital, human capital, financial capital and physical capital) constitute a stock of capital which can be stored, accumulated, exchanged or depleted and put to work to generate a flow of income or other benefits (Narayan & Pritchette, 1999).

Further, livelihood outcomes are not just dependent on access to capital assets or constrained by vulnerability context, they are also transformed by the environment of structures and process which may facilitate or deny entitlements (Serrato, 2008). Institutions create and determine vulnerability context, assets and outcome. In addition, institutions enable people to achieve positive livelihood outcomes by providing enabling environment for people to pursue their livelihood options (Okon, 2014). However, one area of policy that has the potential of building the security of poor households' livelihood is that of pro-poor policy (Ferrington, Rasmut and Walker, 2002). They further highlighted that people rather than resources or institutions should be the focus of any development strategy. The SLAs considers the causes of vulnerability of the poor, their assets and the policies, processes and institutions that affect their use of assets. These combine to produce a wide range of ways in which urban farm household construct their livelihood (Okon, 2014).

The Study area

The study was carried out in the South-South geopolitical zone of Nigeria, which is strategically located at the point where the river Niger joins the Atlantic Ocean through the gulf of guinea. Nigeria lies between latitudes 40 and 140 N and longitudes 30 and 140 E, covering a land area of about 92,000km2 with a population of about 184 million people (NBS, 2016). The South-South region is made up of six out of the 36 States of the Federal Republic of Nigeria. The six States are Akwa Ibom, Bayelsa, Cross River, Edo, Delta and Rivers States. The area has a total population of 21,034,081 people (NPC, 2006). The South-South which is the core oil producing area provides the economic mainstay of the country: oil and gas. In addition to oil and gas, the region equally contributes other key resources, with potential huge opportunities in tourism and agriculture. It has an average annual rainfall of 1,200 to 2,500mm (NiMET, 2013). The climate of the area allows for favourable cultivation and extraction of agricultural and forest products such as palm produce, rubber, cocoa, cassava, yam, plantain, banana, maize, vegetables, timber and others. Majority of the inhabitants are farmers, practicing farming and other enterprises such as crop production, livestock breeding, forestry practices, fisheries, aquaculture, agricultural processing as well as urban commerce and transport business.

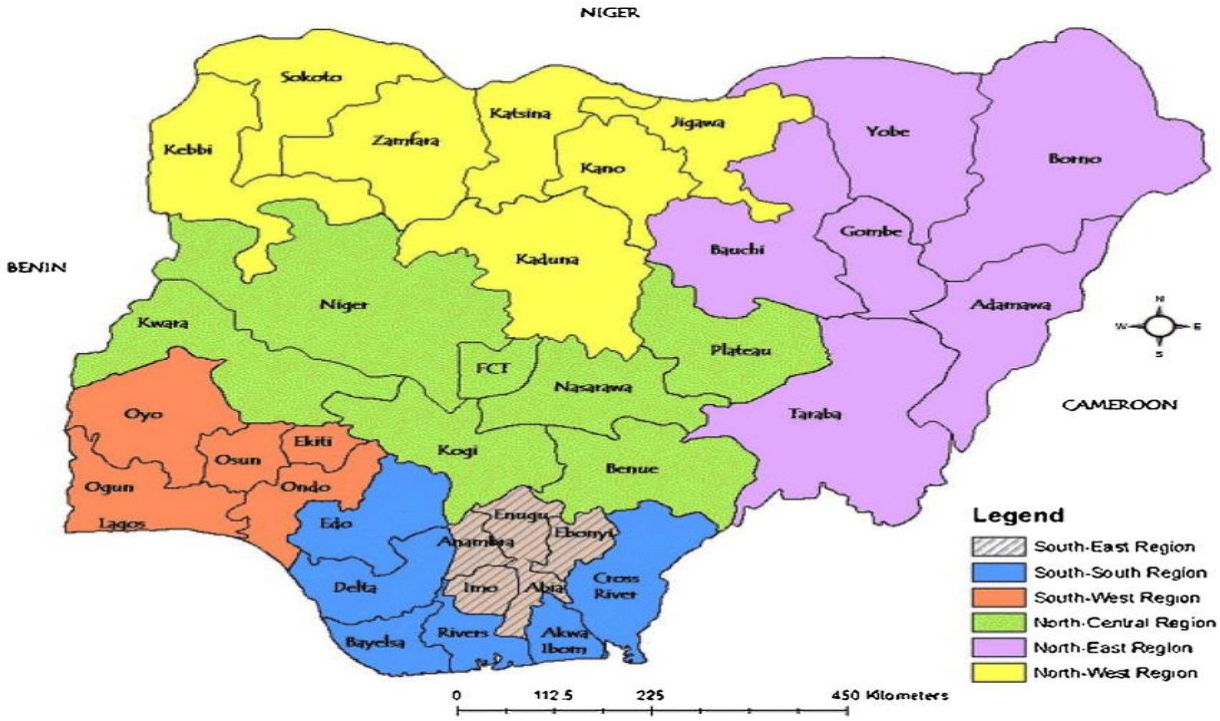

Figure 1: Map of Nigeria showing the six geopolitical Zones. The blue portion is the study area (South- South region).

Methodology

Sampling procedure and sampling size

This study employed purposive, multistage and simple random sampling techniques in selecting the respondents. Three (3) out of the six States in the South-South geographical zone were randomly selected, namely: Akwa Ibom, Cross River and Delta States. Three of the State capitals were purposively selected (namely, Uyo, Calabar and Asaba), since the study is on urban agriculture. Three additional towns classified as urban from Nigerian living Standard survey were randomly selected from each of the selected States, namely; Ikot Ekpene, Ikom and Warri from Akwa Ibom, Cross River and Delta States respectively, making a total of six urban areas. Lists of urban farmers were obtained from the State Agricultural Development Programme offices. Eighty households were randomly selected from each of the three selected State capitals, while twenty households were randomly selected from each of the additional towns in the State. This gave a sample size of three hundred households (100 from each State). However, data from 289 households were used for analysis after 11 were dropped due to missing information on some important variables.

Data collection

Data for this study were obtained mainly from primary sources using structured and pretested questionnaires administered by the researcher and trained enumerators to cover the three selected States. Data were collected for a period of one year (between April, 2013 and March, 2014). The data focused on the following: level of livelihood assets available to the respondents, different livelihood strategies adopted by the urban farm households, membership of organizations, gender of household heads, and engagement in agricultural/ non-agricultural activities. Further, the respondents were classified according to their major livelihood strategies in order to compare their responses. Broadly, this study disaggregates activities and/or livelihood strategies into seven categories: (i) Crop production; (ii) Livestock production (iii) Agricultural wage employment, including earnings from supplying wage labour to other farms; (iv) non-agricultural wage employment, including income from both formal and informal wage employment (v) other income sources, i.e. income from owned businesses; (vi) remittance income received from relatives and friends not presently living in the household; (vii) income from pension, shares and rents. However, the first three are grouped into agricultural income while the last four are grouped into non- agricultural income. This study focused on urban households' involvement in agriculture and other activities. Therefore the location of farm land could be rural, peri-urban or urban areas.

Estimation Technique

Multinomial Logit model (MNL)

The discrete nature of the dependent variable (choice of livelihood strategies/activities) implies that urban farmers have a wide range of selection portfolios to handle. The probability of an urban household choosing from the set of strategies is more or less influenced by the households' socio-economic characteristics. Hence, the usual modeling approach involving multiple choice decision or adoption process is the application of multinomial logit (Deressa, Hassan, Ringler, Alemu and Yesuf, 2009; Hassan and Nhemachen, 2008; Ochieng, Owuor and Bebe, 2012). Additionally, multinomial logit model allows analysis of decisions across more than two categories and facilitates in the determination of choice probabilities for different categories (Madalla, 1983). Moreover, MNL is appropriate under condition of dealing with data sets that consist of individual specific characteristics (Green, 2003).

In this study, the multinomial logit was used to estimate the influence of socio-economic characteristics of the respondent on their choice of livelihood strategies/activities in South-South, Nigeria. The choice decision which determines the odds of a particular household choosing one of the categories of livelihood strategies/activities activity listed in section 3.3 above was chosen. The multinomial logit model can be estimated with set of coefficients $\beta^{(1)}$, $\beta^{(2)}$, $\beta^{(3)}$ $\beta^{(4)}$ $\beta^{(5)}$ $\beta^{(6)}$ $\beta^{(7)}$ as follows:

$$\Pr\ (Z = 1) = \frac{\ell^{x\beta(1)}}{\ell^{x\beta(1)} + \ell^{x\beta(2)} + \ell^{x\beta(3)} + \ell^{x\beta(4)} + \ell^{x\beta(5)} + \ell^{x\beta(6)} + \ell^{x\beta(7)}} \quad \ldots\ldots (1)$$

$$\Pr\ (Z = 2) = \frac{\ell^{x\beta(2)}}{\ell^{x\beta(1)} + \ell^{x\beta(2)} + \ell^{x\beta(3)} + \ell^{x\beta(4)} + \ell^{x\beta(5)} + \ell^{x\beta(6)} + \ell^{x\beta(7)}} \quad \ldots\ldots (2)$$

$$\Pr\ (Z = 3) = \frac{e^{x\beta(3)}}{e^{x\beta(1)} + e^{x\beta(2)} + e^{x\beta(3)} + e^{x\beta(4)} + e^{x\beta(5)} + e^{x\beta(6)} + e^{x\beta(7)}} \quad (3)$$

$$\Pr\ (Z = 4) = \frac{e^{x\beta(4)}}{e^{x\beta(1)} + e^{x\beta(2)} + e^{x\beta(3)} + e^{x\beta(3)} + e^{x\beta(5)} + e^{x\beta(6)} + e^{x\beta(7)}} \quad (4)$$

$$\Pr\ (Z = 5) = \frac{e^{x\beta(5)}}{e^{x\beta(1)} + e^{x\beta(2)} + e^{x\beta(3)} + e^{x\beta(4)} + e^{x\beta(5)} + e^{x\beta(6)} + e^{x\beta(7)}} \quad (5)$$

$$\Pr\ (Z = 6) = \frac{e^{x\beta(6)}}{e^{x\beta(1)} + e^{x\beta(2)} + e^{x\beta(3)} + e^{x\beta(4)} + e^{x\beta(5)} + e^{x\beta(6)} + e^{x\beta(7)}} \quad (6)$$

$$\Pr\ (Z = 7) = \frac{e^{x\beta(7)}}{e^{x\beta(1)} + e^{x\beta(2)} + e^{x\beta(3)} + e^{x\beta(4)} + e^{x\beta(5)} + e^{x\beta(6)} + e^{x\beta(7)}} \quad (7)$$

The model however is unidentified in the sense that there is more than one solution to $\beta^{(1)}$, $\beta^{(2)}$, $\beta^{(3)}$, $\beta^{(4)}$, $\beta^{(5)}$, $\beta^{(6)}$ and $\beta^{(7)}$ that lead to the same probabilities for Z = 1, Z = 2, Z = 3, Z = 4, Z = 5, Z = 6, Z = 7. To identify the model, one of the $\beta^{(1)}$, $\beta^{(2)}$, $\beta^{(3)}$, $\beta^{(4)}$,$\beta^{(5)}$,$\beta^{(6)}$, $\beta^{(7)}$ is arbitrarily set to O. That if $\beta^{(7)}$ is arbitrarily set = 0, the remaining coefficients $\beta^{(1)}$, $\beta^{(2)}$ $\beta^{(3)}$, $\beta^{(4)}$ $\beta^{(5)}$ and $\beta^{(6)}$ will measure the change relative to the Z = 7. In other words, this study analysed the socio-economic factors that influence the urban farm households' choice one of the seven livelihood activities and/or strategies. Therefore, using seven category response as in the model for this study and setting $\beta^{(7)}$ = 0, the equation becomes.

$$\Pr\ (Z = 1) = \frac{e^{x\beta(1)}}{e^{x\beta(1)} + e^{x\beta(2)} + e^{x\beta(3)} + e^{x\beta(4)} + e^{x\beta(5)} + e^{x\beta(6)} + 1} \quad (8)$$

$$\Pr\ (Z = 2) = \frac{e^{x\beta(2)}}{e^{x\beta(1)} + e^{x\beta(2)} + e^{x\beta(3)} + e^{x\beta(4)} + e^{x\beta(5)} + e^{x\beta(6)} + 1} \quad (9)$$

$$\Pr\ (Z = 3) = \frac{e^{x\beta(3)}}{e^{x\beta(1)} + e^{x\beta(2)} + e^{x\beta(3)} + e^{x\beta(4)} + e^{x\beta(5)} + e^{x\beta(6)} + 1} \quad (10)$$

$$\Pr\ (Z = 4) = \frac{e^{x\beta(4)}}{e^{x\beta(1)} + e^{x\beta(2)} + e^{x\beta(3)} + e^{x\beta(4)} + e^{x\beta(4)} + e^{x\beta(5)} + e^{x\beta(6)} + 1} \quad (11)$$

$$\Pr\ (Z = 5) = \frac{e^{x\beta(5)}}{e^{x\beta(1)} + e^{x\beta(2)} + e^{x\beta(3)} + e^{x\beta(4)} + e^{x\beta(4)} + e^{x\beta(5)} + e^{x\beta(6)} + 1} \quad (12)$$

$$\Pr\ (Z = 6) = \frac{e^{x\beta(6)}}{e^{x\beta(1)} + e^{x\beta(2)} + e^{x\beta(3)} + e^{x\beta(4)} + e^{x\beta(4)} + e^{x\beta(5)} + e^{x\beta(6)} + 1} \quad (13)$$

$$\Pr\ (Z = 7) = \frac{1}{e^{x\beta(1)} + e^{x\beta(2)} + e^{x\beta(3)} + e^{x\beta(4)} + e^{x\beta(5)} + e^{x\beta(6)} + 1} \quad (14)$$

The relative probability of Z = 1 to the base category is

$$\frac{\Pr(Z = 1)}{\Pr(Z = 7)} = \ell^{x\beta(1)} \quad \text{..... (15)}$$

If this is called the relative likelihood and assume that X and $\beta_k^{(1)}$ are vectors equal to (X_1, X_2..., Xn) and ($\beta_1^{(1)}$, $\beta_2^{(1)}$,….$\beta k^{(1)}$) respectively, the ratio of relative likelihood for one unit change in X_i relative to the base category is then stated as;

$$\frac{\ell^{\beta_1^{(1)}} x_1 + \ldots\ldots\ldots + \beta_1^{(1)} (x_1+1) + \ldots\ldots + \beta_k^{(1)} x_k}{\ell^{\beta_1^{(1)}} x_1 + \ldots\ldots\ldots + \beta_1^{(1)} x_1 + \ldots\ldots\ldots\ldots + \beta_k^{(1)} x_k.} \quad \text{..... (16)}$$

The exponential value of a coefficient is the relative likelihood ratio for one unit change in the corresponding variable (StataCorp 1999 cited in Enete 2003). As stated earlier, the dependent variable "Livelihood activities and/or strategies" have seven (7) possible values; value 1,if the household partake in livestock production as a major activity, value 2 if the major activity is crop production, value 3 if the major activity is agric. wage employment, value 4 if the major household activity is Non- agric. wage employment, value 5 if the major livelihood activities is from other sources (owned businesses), value 6 if receiving remittance is the major source of livelihood, and value 7 if receiving income from pension, shares, and rents is the major livelihood activity. Some socio-economic characteristics of the farmers used as explanatory variables for the Mlogit model are listed below.

X_1 (Farmsize) = Household farm size (in hectares)
X_2 (Gender) = Gender of Household Head (Dummy 1= male, 0= female)
X_3 (Adequi) = Adult Equivalent (Household members above 18 years of age).
X_4 (Memorg) = Number of Organizations in which household heads are member (in Number)
X_5 (Deppop) = Dependent population (Number of household members 15 years and below and above 65 years)
X_6 (Edu**)** = Years of formal schooling of the household head (in years)
X_7 (Age) = Age of household heads (in years)
X_8 (Fexp) = Years of faming experience (in years)
X_9 (Mstat) = Marital Status of the household head (dummy, 1= married, 0 = single)

Results and Discussion

The level of Livelihood asset available to the respondents

The level of asset ownership in a household is an indication of its endowment and provides a good measure of household resilience in times of food crisis, resulting from famine, crop failures, government policies, loss of job, or natural disasters. This is because a household can easily fall back on its asset in times of need by selling or leasing them. Table 1 presents the assets owned by households covered in the study. The Table shows that mobile phones (100%) were the most common asset owned by the surveyed households, followed by radio and television sets (78.20%). This is indicative of improved economic welfare among the surveyed urban farming households. This implies that the household can easily access market information on price changes, as well as information on lucrative livelihood activities to embark upon for an improved living standard. Other assets owned by the respondents include refrigerators (38.75%), land (36.67%) and sewing machines (33.56%). Most households may obtain loan to acquire refrigerators for sales of cold water/drinks. However, 32.18% of the respondents owned other assets (like wheel barrows, wooden trucks and other small equipment), 21.80% of the respondents owned tricycles, while motor vehicles were owned by 21.11% of the respondents.

Socio-economic factors influencing participation in livelihood activities by urban farm households in the study area.

The multinomial logit regressions are reported in Table 2, using "Non- Agricultural Wage Income,

livelihood option (4)" as the base category. The results of the multinomial logit model indicate that socio-economic factors (farm size, gender, number of adults in the household, number of organizations which the household head belongs to, dependent population, educational status of household heads, age of household heads, farming experience, and marital status) influenced the type of livelihood activities and/or strategies adopted by the respondents.

The estimated coefficient of the MNL model along with the levels of significance, are presented in Table 2. The likelihood ratio statistics as indicated by Ch^2 was highly significant ($P < 0.0000$), showing that the model has a strong fit. In terms of consistency with *a priori* expectations on the relationship between the dependent and the explanatory variables, the model appears to have performed well. However, the parameter estimates of the MNL model provide only the direction of the effect of the independent variables on the dependent (response) variable: estimates do not represent actual magnitude of change or probabilities. Thus, the marginal effects from the MNL, which measure the expected change in probability of a particular choice being made with respect to a unit change in an independent variable, are reported and discussed. In all cases the estimated coefficients was compared with the base category (Non-Agric Wage-Income activity). Table 3 presents the marginal effects along with the levels of statistical significance.

The positive effects of farm size indicate that it is closely linked to agricultural wage income as major livelihood options. Households with large farm sizes are more likely to prefer livestock production ($p< 0.01$), crop production ($p< 0.01$) and agricultural wage employment ($p< 0.01$) as their major livelihood activities/strategies as opposed to non-agric wage income. Also, the result of the marginal effect (Table 3) indicates that an additional hectare of land *ceteris paribus* will result in a 12.6%, 14.51% and 1.2% increase in the probability of household choosing Livestock production, Crop production and Agric-wage employment respectively as their major livelihood activities and/or strategies. The positive relationship between farm size and agricultural wage income is not surprising, because livestock production, crop production and agric. wage income require land for their operations. Adenagan, Adam and Nwauwa (2013) also found a positive relationship between land size and farm income.

Gender of the household heads (Table 3) indicates that female headed households are 35.99% more likely to choose crop production and 0.5% more likely to choose remittance income as their major strategies, as opposed to Non- agricultural wage income. This could be attributed to central and cultural role of women in household food delivery. The marginal effect (Table 3), also suggests that their male counterparts are 22.40% more likely to choose Non-agricultural wage employment as their major livelihood strategy. This could be because, as compared to Non- agric wage employment, crop production and remittance income may not require educational qualifications; most female headed households lack higher educational qualification which made them settle for low-paid wage employment. Abdulai and CrolesRees (2001), observed that households with more educated heads are more likely to participate in non-agricultural wage employment.

Adult Household Members (Household members aged 18 years and above) was positively related to the likelihood that household members would prefer in livestock or crop production as their major strategy. This could be because of labour intensive nature of livestock and crop production in the area, although the coefficients of adult household members were not statistically significant. The implication of this result is that increasing adult members could increase household participation in labour intensive strategies.

The number of organizations the household heads belong to increased their preference for livestock production, but had no statistically significant influence on other categories of activities. The marginal effects (Table 3) showed that being a member of more than one organization increases the likelihood households choosing livestock production as their major activity by 8.13 percent. The reason for this might be that poultry production (the most common livestock activity in the area) was preferred by of the surveyed households. The increasing cost of feed makes management of the livestock a little difficult. Poultry farmers often get to know the best management practice by the experiences of other farmers. Moreover, other farmers are often the most trusted and only source of information on how they could manage their stock. Meetings of social organizations are a good opportunity to meet other poultry farmers and discussed such issues.

More dependents population (household members aged 15 and below; and above 65 years) as expected, reduced the probability of the household adopting livestock production, agric. wage employment, income from other sources, and will rely on income from pension, rents and shares (Table 2). Conversely, dependent population increases the likelihood that the household will choose crop production activity and remittance income as their major strategies, as opposed to non- agric. wage employment. This is to be expected because, remittance income is mostly sent to dependent members (unemployed and students) of a household to cater for their welfare and school fees. In addition, the unskilled aspect of crop

production (fruit harvesting, and cassava planting) could be done by dependent population. However, the coefficients are not statistically significant across all categories of activities.

Holding other variables constant, a one year increase in the years of education of household head's decreases the probability of the household choosing livestock production, crop production and agricultural wage employment by 0.06%, 7.76% and 0.04% respectively as opposed to non- agric wage employment (Table 3). In other words, a one year increase in educational level of household head decreases their probability of choosing livestock production, crop production and agric. wage employment. A plausible explanation is that more educated household heads could be gainfully employed in government organizations, and as such, may not participate in urban farming (farm income) activities. This finding agrees with the results of Reardon, Berdegue and Escorbar (2001) who asserted that, more educated people avoid farm wage employment and are mostly engaged in non-farm wage employment. Also, de Janvry, Sadoulet and Zhu (2005), found a positive relationship between education and participation in non-agricultural employments. In addition, Taylor and Yunez-Naude (2000) observed that the human capital of household as measured by schooling is expected to generally be linked to non-agricultural activities, since this is where the returns to education are more likely to be highest. Also, Table 3 shows that a one unit increase in age of household heads statistically increases the likelihood of the urban farm household choosing remittance and income from pension, rents and shares, while a one unit increase in age *ceteris paribus*, decreases the likelihood of the respondent choosing other sources/ livelihood strategies by 1.2%, livestock production, crop production, or agric. wage employment as their major activities. The implication of this result is that (agricultural wage livelihood category) could be labour intensive, and as such; the aged household heads may not be energetic enough to carry out these activities. Years of farming experience has a positive and significant effect on household's choice of livelihood strategies and/or activities. For instance (Table 3) indicate that a unit increase in years of experience of household heads results in a 0.44%, 1.56%, 0.19% and 0.85% increase in the probability of choosing (agricultural wage livelihood category) and income from other livelihood sources respectively as opposed to non-agricultural wage employment.

Table 2 shows that the coefficient of marital status has a negative relationship with agricultural wage livelihood category, but a positive relationship with non-agricultural wage categories (non-agricultural wage employment, other livelihood sources, remittance income and income from pension, rents and shares).

Conclusion and Policy Implications

This study unraveled the complex relationships between socio-economic characteristics and livelihood choice decisions among urban farm households in South-South Nigeria. The study shows that all respondents owned mobile phone, about 37%, 34 % and 22% of the respondents owned refrigerator, land and tricycles, respectively. In addition, households with large farm sizes are more likely to choose crop production, livestock production and agricultural wage employment as their major source of livelihood. Higher educational attainment influences non-agricultural livelihood, while female-headed households are more likely to choose crop production as their major source of livelihood. Households belonging to many social organizations increased their likelihood of choosing livestock production. Also, there is a higher probability that aged household heads received remittance and pension, shares and rents as their major livelihood options.

The broader implication of these findings is that including urban agriculture in urban development and planning in Nigeria and other developing countries could exert significant impact on households' livelihood choices, hence, reducing their vulnerability to poverty and food insecurity. Also, female headed households are the most vulnerable; depending only on low paid jobs and crop production (planting on vacant plots or undeveloped government and private land), suggesting that they are at risk of eviction (at any time).

The following policy implication can be drawn from this research. To attain the sustainable development goals (SDG 1 and 2a), measures to minimize hunger, poverty and food insecurity in urban areas should focus on identification of the problems and investment targeted at household level. This could be done by building household asset and including agricultural villages in town planning in Nigeria as well as other developing countries. Additionally, investment in female education will enable them to get higher remunerative jobs as against low- wage employment. Furthermore, developing a hired labour market for women in developing countries will enable them to participate efficiently in production. This will no doubt contribute positively towards overall agricultural growth and development particularly in Nigeria, hence, reducing poverty and food insecurity particularly in sub-Saharan Africa and Africa as a whole.

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