

Contribution of Integrated Urban Agriculture to Household Income: A Case of Mgbirichi in Ohaji–Egbema Local Government Area of Imo State, Nigeria

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ABSTRACT

Urban farmers make efficient utilization of resources by integrating crop-livestock-fish subsectors to maximize accrued benefits. Thus this study specifically assessed the types of integrated urban agriculture mostly practiced by farmers, types of livelihood strategies adopted and at the same time with integrated urban agriculture and its contribution to total household income. Descriptive statistics employed to assess livelihood strategies prioritized by integrated urban farmers. The results show that integrated urban agriculture is the most prioritized livelihood strategy to urban farmers. Majority of urban farmers (98.5%) practising integrated farming concentrated on crop-livestock, while fish-livestock and crop livestock-fish integration adopted only by 0.75% each. This implies that, majority of urban farmers did not practice fish sub-sector. This study focused on income livelihood indicator; however, farmers can also, benefit from integrated agriculture through food security, social inclusion and ecology to mention some. This study also provides a comprehensive layout adopted by integrated urban farmers to benefit from the sub-sectors.

Keywords: Integrated Urban Agriculture, Livelihood Strategy, Income, Household

INTRODUCTION

Global urbanization and environmental threats influence the challenge of ensuring food security for urban residents specifically in developing countries (Poulsen, *et al* 2015). This is attributed due to the fact that large share of urban poor income goes to food expenditure. The efforts to ensure increased productivity to feed the growing population and improving livelihood in general, have been in place.

Urban and peri-urban agriculture are increasingly being promoted for enhancing urban food security and advancing seasonal fluctuations, adaptation and mitigation efforts in cities (Padgham *et al.*, 2015). Urban agriculture can have many different expressions, varying from plant/crop production, poultry and livestock to aquaculture farming (De Bon *et al.*, 2010; Drechsel, and Dongus, 2010). Urban farming can be practiced either through the monoculture system or integrating farming where farmers can involve crop-livestock integration, crop-fish integration livestock-fish integration or crop-fish-livestock integration (Ugwumba *et al.*, 2010). Despite different ways of integration, majority of the urban farmers

practice mostly monoculture farming which has been criticized for not being able optimally benefit farmers (Miccoli *et al.*, 2015 and Nwabueze *et al.*, 2018).

A number of studies have been done on urban and peri-urban agriculture among others include integrating land planning in agriculture (Halloran and Magid, 2013; Mwajombe and Mlozi, 2015) and governance of urban agriculture (Mkwela, 2014). Given the importance of integrated urban agriculture as one way of the enhancing resources used efficiently and existence of a number of farmers in urban areas practicing integrated urban agriculture as their livelihood strategy; thus, it was important to understand the contribution of integrated urban agriculture on household annual income and its influencing factors. Specifically, the paper assessed types of integration adopted by farmers in Etioha in Ohaji –Egbema Local Government Area of Imo State, Nigeria, types of other livelihood strategies adopted by urban farmers simultaneously with integrated urban farming and share of the income from integrated urban agriculture farming income into the total households' income. The information generated from this study will enrich the existing body of

knowledge on integrated urban farming and inform the policies promoting integrated urban farming on the benefit of the sector in households' income and the ways to improve farmers to engage into full integration.

METHODOLOGY

This study was conducted in Mgbirichi in Ohaji – Egbema Local Government Area of Imo State, Nigeria. The site is situated between longitudes 7° 0' 06" E and 7° 03' 00" and latitudes 5° 28' 00" N and 5° 30' 00" N in the humid tropical West Africa. It also has an annual rainfall of 2000mm - 2484mm and average temperature of 26°C (IMLS, 2017).

However, due to various field challenges including availability of respondents, 132 households' heads were interviewed. Focus Group Discussions (FGDs) were organized in each ward to collect in-depth information to verify the data collected through the survey. Each FGD comprised of 6-8 participants as recommended by Kumar and Kalyani (2011). Further information were collected from key informants who were mostly extension officers from wards (both livestock and crop officers) and one agricultural officer from the district to make a total of 12 key informants.

DATA COLLECTION

Questionnaire Method

Well-structured questionnaire having a combination of both open ended and close ended questions were used to obtain data on socio-economic characteristics of the school children. The parameters measured were body weight, height and mid-upper arm circumference. Background information, quantity of food consumed and the anthropometric status such as sex, type of school and dietary habit of the school children were also assessed.

Data Analysis

Data collected were analyzed using SPSS version 11.0. Simple descriptive statistical techniques such as frequency counts, percentages, mean and standard deviation scores were used to analyze the data collected. Chi square was used to test the significance level.

In addition, descriptive statistics (frequencies and percentage) were used to assess types of integration adopted by farmers and income share of each livelihood strategy among integrated urban farmers' households income.

RESULTS AND DISCUSSION

Socio-Demographic Characteristics

Majority of integrated urban farmers were aged between 18 to 56 years. This is the active working age; participation by this age group might be influenced by the profit of the subsector or considering the sub sector as an alternate for earning household income. According to Ugwumba *et al.*, (2010) active participation in any economic activity influenced by others, and age, since majority of participants in integrated urban agriculture are in productive age; hence even performance of the sub sector is likely to be better than their counter parts (aged 60+). Table 1 also shows that majority of the respondents' household were headed by male.

The small number of female headed household in comparison with the number of male headed household might be contributed to the presence of few female headed households; this correlate with Jongwe (2014) findings which hold that; participation on agriculture in urban area was dominated by the household headed by males. Moreover, Majority of the respondents' households had 4-7 members. This might be due to the factor that in the study area, the average household size is five members per household.

Moreover, the household with a higher number of members can have enough labour power for integrated urban agriculture. According to Gallaher *et al.*, (2013) most of the participant in integrated urban agriculture are households with many household members.

Table 1. Socio-demographic characteristics

	Frequency	Percentage
Sex of Household Head		
Female	24	18.2
Male	108	81.8
Livestock Keeping		
Men	53	40.2
Women	79	59.8
Fish Farming		
Men	2	100
Horticultural Production		
Men	41	31.1
Women	91	68.9
Marital Status		
Single	7	5.3
Married	118	89.4
Divorced	4	3.1
Widow/Widower	3	2.3
Education Level		
No Formal Education	2	1.5
Primary	80	60.6

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Secondary	31	23.5
University/College	19	14.4
Household head		
Age 18-30	18	13.6
31-43	48	36.4
44-56	45	34.1
57-69	17	12.9
70 and Above	4	3
Household size		
1-3	25	18.9
4-7	83	62.9
8-11	14	10.6
12-15	7	5.3
16-19	3	2.3

Source: Field Data May 2017

Type of Integrated Urban Agriculture Practiced by farmers

Findings in Table 2 show that there were three types of integration practiced in the study area; these were crop-livestock integration, livestock-fish integration and crop, fish and livestock integration. Majority of farmers (98.5%) concentrated on crop-livestock integration while only few integrate livestock and fish or crop livestock and fish keeping.

This might be due to the facts that fish sub sector is a new enterprise to majority of developing countries including Imo State, Nigeria (Ugwumba *et al.*, 2010) who concluded that majority of integrated urban farmers in Nigeria focus more on crop livestock integration with minimal number engaging into other types of integration. More emphasis needed to help urban farmers in developing countries not underestimating the potential of integrated urban agriculture, extending their integration to include fish sub-sector, and accruing more benefits.

Table2. Types of integration Frequency

	Percentage	
Crop and Livestock Production	130	98.5
Livestock and Fish Farming	1	0.75
Crop Production, Livestock and Fish Keeping	1	0.75

Source: Field Data May 2017

Findings in Table 3 show that, majority (87.9%) processed neither farm produce nor by-product; this is due to lack of enough knowledge of the enterprises and its additional benefits. Even though integrated urban farmers include livestock keepers the use of industrial fertilizer was still pervasive; it was a common trend in integrated urban farmers that they use both organic and inorganic fertilizers in their fields; this is a result of the

lack of knowledge and skills about integration. Farmers believed that industrial fertilizer had immediate impact than organic fertilizer. Considering that, important elements of integration are not only limited to use of bio-fertilizer and crop residuals, but it goes further to the bio-gas and farm produce processing (Ugwumba *et al.*, 2010); thus, partial integration lowers the benefits of integration (Manjunatha *et al.*, 2014). This implies that, farmers are not benefiting much from integration.

Livelihood Strategies of Integrated Urban Farmers

Farmers do not only depends on IUA as their livelihood strategy in urban areas, rather IU Agoes along with other livelihood strategies. The paper shows that, integrated urban agriculture is the highly prioritized livelihood strategy among integrated urban farmers (87.9%) followed by business activities (9.8%) and salaried job (5.3%) as shown in Table 4. The study findings show that, a total of five livelihood strategies including integrated urban agriculture, business, technician/formal employment, and artisan/handcraft are livelihood strategies carried out by integrated urban farmers. However, regardless of multiple livelihood strategies, 87.9% of all selected farmers ranked integrated urban agriculture to be the top livelihood strategy than other livelihood strategies; the rest are salaried employment, business and technicians based on their level of priorities (Table 4).

Generally, literatures on agriculture show that, majority of farmers engages in off -farm activities to diversify their livelihood and accommodate fluctuation in agricultural production (Smale *et al.*, 2016; Kassa *et al.*, 2017; Su *et al.*, 2015). However, in urban setting, the scenario is vice versa, people engage in agricultural activities for the purpose of diversifying their livelihood due to vulnerabilities /insecurity and insufficient income obtained from the formal employment.

However, off -farm livelihood strategy remains crucial for farmers' households as it can contribute to higher farm production and larger expenses on purchased inputs, while it decreases the use of family labour (Babatunde, 2015).

Table3. Elements of integration

	Practising	Not Practising
Farm Produce processing	16(12.1)	116(87.9)
By-Product Processing	29(22)	103(78)
Fertilizer Inorganic Uses	78(59.1)	54(40.9)
Organic Fertilizer Uses	96(72.7)	36(27.3)

Source: Field Data May 2017 *(Values on brackets are percentage)

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Table 4. Livelihood strategies prioritization and ranking by farmers

Livelihood Strategies	First	Second	Third	Fourth
Integrated Urban Agriculture	116(87.9)	12(9.1)	2(1.5)	2(1.5)
Business	6(3.8)	13(9.8)	0(0.0)	0(0.0)
Technical activities/jobs	7(5.3)	3(2.3)	5(4.8)	0(0.0)
Natural Resources	0(0.0)	0(0.0)	1(0.8)	0(0.0)

Source: Field Data May 2017

Contribution of Integrated Urban Agriculture to income of respondents

Integrated urban farmers have various livelihood strategies to contribute to their household income. This makes the contribution of IUA to the total households' income to diverge. The study findings (Table 5) show that majority (81%) of respondents reported that integrated urban agriculture contributes around 81-100 percent to its total household income; they are the people whose primary livelihood strategy is agriculture; thus, they dedicate their capital onto it (Cabannes, 2012).

Despite the high level of contribution of IUA into total household income, the study finds the contribution from other livelihood strategies run simultaneous with IUA by farmers. Each livelihood strategy has its unique contribution to the household income; the incomes generated through those livelihood strategies are the one that determines total annual household income. Integrated urban agriculture also recorded higher income to the overall household income in comparison to other household incomes; however, it was also among household strategies with least income contribution to some households. The reason for IUA to depict least annual income might be due to the fact that, there are some farmers who keep livestock and grow crops for domestic uses only (Maitra *et al.*, 2015), thus selling of produce is only optional.

Table 5. Contribution of integrated urban agriculture to household income

IUA Contribution to Household income (%)	Frequency	Percent
1-20	3	2.3
21-40	5	3.8
41-60	8	6.0
61-80	9	6.8
81-100	107	81.1
Total	132	100.0

Source: Field Data May 2017

CONCLUSIONS AND RECOMMENDATION

The findings show that there is very limited livestock-fish integration, crop-livestock-fish integration; majority of farmer concentrated on crop-livestock integration. Thus, there is a need for government and development agents to strengthen farmers' ability on fish subsector. The paper concludes that integrated urban agriculture has significant contribution to household income; it contributes around 81-100 percent to total annual income for majority of households in the study area.

Farmers in urban areas normally practice IUA along with other livelihood strategies such as professional employment, business and technical activities. However, the multiple linear regression showed that these off -farm livelihood strategies have a positive contribution to IUA income but not significant. Thus, considering the important contribution of IUA to household income and environment, urban farmers should be encouraged to practice integration rather than monoculture. Since majority of farmers were practising partial integration with major focus on crop-livestock integration, sensitization is needed to help farmers practice full integration that involves processing of farm produce and farm by-product.

In addition, farmers should be encouraged to integrate fish subsector with other sub-sectors such as crop and livestock since fish keeping is a newly growing enterprise.

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