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Evaluation of Off-Farm Income-Generating Activities among Agroforestry Farmers in Sakponba Forest Reserve area, Edo State, Nigeria

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Abstract
The study evaluated off-farm generating activities among agro-forestry farmers in the Sakponba forest reserve area of Edo State, Nigeria. A multi-stage random sampling technique was used to collect data from one hundred and twenty (120) agroforestry farmers using a structured interview schedule. Percentages and frequency counts were used to analyse the objectives of the study. The result showed that majority 64.2% of the farmers were male. Further analysis indicated that 88.3% of the farmers engaged in cassava processing and 32.5% in *okada* business as off-farm income-generating activities. Further analysis revealed that 88.3% were involved in off-farm activities to generate additional income. However, 70.8% highlighted that high cost of transportation was a constraint, while, 59.2% indicated that inadequate diversification skills and training opportunities were the main constraints faced in engaging in off-farm income-generating activities. The study recommended that the government provide infrastructure such as a good road network, electricity, potable water, and affordable healthcare system, since they are important indicators for enhancing socio-economic activities in rural areas. It was also recommended that the government initiate policies for reducing risk and uncertainties inherent with agricultural activities such as access to credit to improve their standard of living and increase productivity.

Keywords: Agro-forestry, Evaluation, Generation, Income, Off-farm

Introduction

In many developing countries, particularly Africa, agricultural income represents an essential component of rural households' subsistence. However, this type of income exhibits a high seasonality and leads to uncertain outcomes, mainly due to market prices volatility and environmental hazards. Consequently, household members partly allocate their working time to activities that provide a more stable income to cope with adverse shocks (Ellis, 2000). Rural areas usually provide two income sources to their dwellers; Farm and the non-farm economy. In the rural areas of Nigeria, most households are involved in farm activities, and many of them get their income from non-farm activities (World Bank, 2008). Thus, it is hard to find peasants who do only farming in the rural area. Nigeria is also majorly characterised by large numbers of rural areas with high poverty levels (Olowa, 2012). Based on this premise, agricultural activity remains the primary occupation of the rural people. However, agriculture alone cannot reduce these poverty levels; hence, off-farm activities are imperative. Off-farm activities are supplementary or complementary activities that farmers engage in either off-season or on-season to support themselves, such as petty trading, wine tapping, casual labour, and transportation business (Ovwigho, 2014). Rural areas usually provide two income sources to their dwellers; farm and the off-farm economy. In the rural areas of Nigeria, most households are involved in farm activities, and many of them get their income from off-farm activities (World Bank, 2008).Off-farm activities are increasingly important in many rural societies not just to complement or supplement on-farm activities but as sources of strong income and employment growth (ILC, 2008).

In Africa, and Nigeria, inclusive, agroforestry farmers are involved in various economic activities in their complex income strategies. Knowing fully the general importance of agriculture to livelihood sustainability, it is neither the main but the primary activity of the poor (Jabo *et al*., 2014). Rural transformation is not just a question of what happens on African farms; indeed, half the income of rural households in the developing world comes from off-farm income (Nwanze, 2016). Therefore, this implies agriculture is not only an activity

engaged in by the agroforestry farmers but also a diverse array of activities and enterprises. Off-farm incomes, comprise of income activities away from the farmland, have recently become an essential component of livelihood strategies among rural households (Sarah, 2015). Off-farm income has become an important component of livelihood strategies among rural households in most developing countries (Babatunde *et al*., 2010). Declining farm income and the desire to ensure against agricultural production and market risk have been advanced as the reasons for participating in off-farm employment. For instance, when farming becomes less profitable and riskier due to population pressure and crop and market failures, farm households would be pushed into off-farm activities (a case of distress-push diversification). On the other hand, when returns to off-farm employment become higher and less risky than on-farm employment, farm households would be pulled into off-farm work (a case of demand-pull diversification) (Reardon, 1997; Ellis and Freeman, 2004). Researchers have recognised both scenarios of distress-push and demand-pull diversification. However, some studies have assumed that distress-push effects were dominant, citing shrinking per capita land availability as the major reason for increasing off-farm activities (Reardon *et al*., 2001; Van den Berg and Kumbi, 2006). In contrast, Babatunde *et al*. (2010) noted that land was not the most limiting factor.

In any case, off-farm income had contributed significantly to total household income (Bjornsen and Mishra, 2012) of especially resource-poor farm households in developing countries. These findings indicated a complementary relationship between farm income and off-farm income existed. Sample studies of rural income portfolios showed that, on average, roughly 50% of rural households' income in sub-Saharan Africa is generated from engagement in non-farm activities and transfer from urban areas or abroad, with remittance and pension payments being the chief categories of such transfer (Ellis, 2000; Ellis and Freeman, 2004). Off-farm activities have become an important component of livelihood strategies among rural households in most developing countries. Several studies have reported a substantial and increasing share of off-farm income in total household income (Ruben and van den Berg, 2001; deJanvry and Sadoulet, 2001; Haggblade *et al*., 2007). This observed income diversification includes declining farm incomes and the desire to insure against agricultural production and market risks (Kijima *et al*., 2006; Matsumoto *et al*., 2006; Reardon, 1997).

According to Kwon *et al*. (2006), farm households faced large fluctuations in farm income due to weather and price shocks. In order to mitigate the effects of these fluctuations or lessen exposure to such risks, farm households often adopted such principles as futures market, forward contracts, or insurance market. Unfortunately, these approaches were not within the reach of small-scale farmers in rural areas of developing countries. Kwon *et al.* (2006) indicated that government intervention in farm gate prices through price supports or loan deficiency payments could moderate the magnitude of the fluctuations. Efficient farm credit administration has also been suggested to minimize risks associated with farm production. However, the efficiency of government interventions supports and credit supplies in Nigeria leave so much to be desired. Hence, farm-level net income and capital variability has persisted with attendant consequences.

While recognizing the urgent need to maintain a robust agricultural sector, it is increasingly becoming clear that the agricultural sector alone cannot be relied upon as the core activity for rural households as a means of improving livelihood, improve livelihoods and reduce poverty. However, when farming becomes less profitable and more risky as a result of population growth, crop and market failures; households are pushed into off-farm activities leading to “"distress-push” " diversification. However, households are rather pulled into the off-farm sector, especially when returns to off-farm employment are higher or less risky than in agriculture, resulting in “"demand-pull” " diversification also. Therefore, this study seeks to provide an in-depth understanding of the evaluation of off-farm income generating activities among agro-forestry farmers in the Sakponba forest reserve area of Edo State.

Methodology

Study Area

The study was conducted in Sakponba Forest Reserve, Edo State, Nigeria. The climate is typically tropical with two major seasons, the rainy and the dry seasons. The rainy seasons last between April to November and the dry season; December to March. The Sakponba forest reserve is located in Orhionmwan Local Government Area, about 30 kilometers southeast of Benin-city. There are 20 villages located around the reserve. The people of the area are predominantly farmers and traders. Crops grown in the area include; yam, cassava, plantain and cocoyam, while *Tectona Grandis*, *Gmelina Ivorensis*, *Terminalia Ivorensis* and *Khaya Ivorensis* are some of the tree species grown in the area. Primary data were obtained using well structured questionnaire. A total of 10 villages where agroforestry system is being practiced were purposively selected from the study area, after which 12 agro-forestry farmers were randomly selected from each of the 10 villages to give a total of 120 respondents.

Results and Discussion

Findings from Table 1 revealed the age distribution of respondents; 15.0% were below 20 years of age, 19.2% were within 21 to 30 years, 35.0% between 31 to 40 years, and 10.8% above 50 years. It could be deduced from the result that majority of the farmers were between 21 and 40 years. This implies that the respondents were mature enough to participate in this study. Majority of the respondents were males (64.2%), while females represented 35.8% of the total population. This implies that agroforestry in the study area is male

dominated. According to FAO (2006) lack of access to capital affected women's participation in agro-forestry. About 60.8% of the farmers had farm size between 1 to 5 hectares, 23.3% between 4 to 10 hectares, and 15.8% form 10 to 15 hectares of land. This finding shows that majority of the respondents were small-scale farmers, which is characteristic of the African farmer.

Table 2 showed that most of the agro-farmers (88.3%) took *gari* processing as their off-farm activities. Furthermore, 60% were involved in broom making, 32.5% were in okada business, while 21.7% were engaged in cloth weaving. Also, 48.3% were engaged in palm oil processing, 43.3% were hunters, and 40.8% engaged in herbal medicine. In addition, 34.2% were into tailoring, 26.7% traditional doctors, and 53.3% food sellers. Justifying this result, Davis *et al*. (2017) inferred that incomes from non-agricultural enterprises and non-agricultural wage labour have accounted for 53% of the total household income of rural households in Africa. Similarly, Ogbanje *et al*. (2015) corroborated that most rural households receive income from off-farm sources and self employment activities.

Results from Table 3 showed the reasons for their involvement in off-farm activities. About 88.3% of the respondents highlighted that it was to generate additional income. About 90% indicated to help reduce poverty, 73.3% explained that it was due to the lack of access to farm inputs, inadequate markets, poor farm produce, and poor produce pricing. Furthermore, the table revealed that 41.7% got involved in off- farm activities because of declining conditions of agriculture due to climate change, and 45% noted it was due to the pest and disease infestation of their farms resulting in low yields. Dev *et al*. (2016) noted that Income diversification remains a strategy employed by households to minimize income variability and guarantee potential high-income level.This result also validated Ibekwe *et al.*(2010) that non-farm activities have become an important component of livelihood strategies among rural households.

Results from Table 4 showed the constraints militating against off-farm activities among the respondents Majority (86.7%) indicated poor market information on prices of farm commodities, while 68.3% reported inadequate credit facilities and loan provision. This will doubtlessly affect the growth and expansion of their enterprises. This also has the ability to hinder large-scale operations. In the absence of a well-functioning credit market, the participation of poor households will be in lower paying easy-entry farm wage labour market and labour intensive low paying rural off-farm activities and less in high paying rural off-farm activities self-employment. Also, 70.8% revealed that high cost of transportation was their constraint. This is preponderant in rural areas where social and physical infrastructure allocation was neglected. Road networks for instance is very important to farmers as most of them had earlier stated that they engage in marketing and sale of farm produce etc., which requires the transportation of commodities, while 39.2% attributed their constraint to high health risks and hazards.

H_o^1 – There is no significant relationship between the reasons for involvement in off-farm activities and the constraint to off-farm activities in the study area

The result of the correlation in Table 5 shows that there is a significant relationship ($p < 0.05$) between the reasons for involvement in off-farm activities and the constraints to off-farm activities ($r = 0.410$ $p < 0.001$) in the study area. The study result revealed a positive and direct relationship between the reasons for involvement in off-farm activities and the constraints to off-farm activities in the study area. Off-farm income can also enhance agricultural production by relaxing liquidity and credit constraints to purchase productivity-enhancing agricultural technologies such as improved seed, fertiliser, machinery, and hiring labor (Kilic*et al*., 2009; Oseni and Winter, 2009; Anriquez and Daidone, 2010). This assertion is particularly true in developing countries where farmers are facing credit constraints (Stampini and Davis, 2009).

Conclusion

Off-farm income appears to be an important component of the income strategy, particularly for agro-forestry farmers, and it has recently received increased attention in discussions about rural development and poverty reduction. Results have shown that off-farm income is of great importance to rural economies for its productive and employment effects: the development of off-farm activity in the food system will go a long way to increase farming profits by increasing the availability of inputs and improved access to markets, while the income it generates to households represents a considerable and growing share of rural incomes especially for the rural poor. These contributions will become increasingly significant for food security, poverty alleviation, and farm sector competitiveness and productivity in the years to come. Off-farm work helps augment on-farm income, diversify against risk, and enhance returns. The study further revealed that different infrastructural and institutional factors influence the household's choice of income diversification strategies. Households' have a greater likelihood of only participating in one off-farm work due to poor infrastructure, poor credit facilities, low income, and other constraints faced by farmers in the rural areas. Based on the findings of this study, it is advocated that government policies should support strengthening the effectiveness of national and local institutions and their legal frameworks to formulate, coordinate and implement equitable policies, programs and projects to foster the social and economic participation of agoforestry farmers in off-farm activities and; to improve their status in the society. Access to credit is one of the keys to an improved standard of living and higher productivity for both the farm and off-farm sector in rural areas. Special attention should be given to programs or activities that encourage farmers' access to credit and consequently raise their productivity, either individually or through organized, productive groups. The government should aim to

increase access to off-farm activities for all rural households, especially for households with little human, financial and natural assets, and decrease the constraints that hinder the rural households from participating in off-farm activities. Policy options should not be limited to agroforestry farming, but rather to off-farm activities since both are equally important for the rural economy. Specifically, promoting rural economy by focusing attention on farming and neglecting off-farm activities is likely to lead to rural income inequality and worsen the problem of urban migration. Inclusive growth in the farm and off-farm sectors of the rural economy can only occur when basic key conditions are met. When the rural community is influential economically, it will facilitate more robust demand for local agricultural produce, thereby, stimulating farmers to increase and diversify production

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Table 1: Distribution of the socio-economic characteristics of the respondents (n = 120)

Variable	Frequency	Percentage (%)	Mean
Age			
Less than 20	18	15.0	
21 – 30	23	19.2	
31 – 40	42	35.0	
41 – 50	24	20.0	
Above 50	13	10.8	34.5
Sex			
Male	77	64.2	
Female	43	35.8	
Marital Status			
Single	36	30.0	
Married	72	60.0	
Divorced	10	8.3	
Widowed	2	1.7	
Educational Level			
No formal education	1	0.8	
Primary education	23	19.2	
Secondary education	55	45.8	
Tertiary education	33	27.5	
Vocational education	8	6.7	
Farm size in hectares			
1 – 5	13	60.8	
6 – 10	28	23.3	
11 – 15	19	15.8	
Secondary Occupation			
Trading	43	35.8	
Fishing	25	20.8	
Palm wine tapping	26	21.7	
Firewood selling	37	30.8	
Others			
Annual Income			
Below 100,000	6	5.0	
100,001 – 200,000	28	23.3	
200,001 – 300,000	26	21.7	
300,001 – 400,000	33	27.5	
Above 400,000	27	22.5	₦352,151.53k

Source: Field Survey, 2021

Table 2: Off-farm income-generating activities

Activities	Frequency	Percentage (%)
Cassava processing to garri or flour	106	88.3
Maize Processing	31	25.8
Palm oil processing	58	48.3
Yam processing	21	17.5
Broom making	72	60.0
Cloth weaving	26	21.7
Frying akara/yam	50	41.7
Selling palm wine	76	63.3
Tailoring	41	34.2
Traditional healing	32	26.7
Selling of herbal medicine	49	40.8
Bike (Okada) rider business	39	32.5
Grinding of pepper, flour	39	32.5
Food selling	64	53.3
Hunting	52	43.3

Source: Field Survey, 2021

Table 3: Reasons for involving in off-farm activities

Statements	Frequency	Percentage (%)
To generate additional income	106	88.3
Reduction of poverty	108	90.0
Lack of access to farm inputs, market, poor produce price	88	73.3
Lack of market and poor produce price	40	33.3
Pest and disease infestation on farms	54	45.0
Shortage of farm labour	55	45.8
Declining conditions of agriculture as a result of climate change	50	41.7
Reduction in crop yield resulting in low income	73	60.8

Source: Field Survey, 2021

Table 4: Constraints militating against off-farm income-generating activities

Statements	Frequency	Percentage (%)
Poor market information on prices of commodities	109	86.7
High cost of transportation	85	70.8
High health risk	56	46.7
Inadequate skills/training opportunities	71	59.2
Inadequate credit facilities/loan provision	82	68.3
Low patronage by customers	42	35.0
High health risks/hazards	47	39.2
Low wages/poor working conditions	65	54.2

Source: Field Survey, 2021

Table 5: Correlation results between reasons for involving in off farm activities and the constraint to off - farm activities

Variables	r – value	P – value	Decision
Reasons for involving in off farm activities VS the constraint to off farm activities	0.410	1	S