AN ASSESSMENT OF THE ROLE OF NON-FARM SOURCES IN HOUSEHOLD INCOME DIVERSIFICATION IN OYO STATE

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ABSTRACT

Agriculture is the major income source in Nigeria's rural areas. Climatic variability and rising cost of agricultural inputs and household consumables without corresponding rise in agricultural product prices are however driving noted rural farmers to adopt alternative livelihood strategies. Charcoal production has now become a significant source of supplementary income for residents of rural communities in several parts of Nigeria. This study assessed the role of non-farm sources in household income diversification in Oyo state with focus on the contribution of charcoal production and its implication for sustainable development. Participatory rural appraisal techniques of Focus Group Discussion (FGD) and structured interview/questionnaire were adopted. Results of the social survey indicated that farming is still the dominant activity in the region with about 80% of the respondents involved. Households employed an average of 2 income activities with share of off-farm income and Herfindahl Diversification Index of 0.68 and 0.78 respectively, showing a high magnitude of diversification. An adaptation cycle was also constructed based on their current realities, to guide specific interventions. Formalization of production activities and development of other economic activities were suggested to ensure sustainability of forest resources in the area.

Key Words: Agriculture, Charcoal, Household income, Forest management

INTRODUCTION

Farming and animal husbandry have always been regarded as the main economic activities or sources of livelihood for rural dwellers especially in sub-Saharan Africa. In Nigeria, about 70% of the active population is involved in agriculture, most of which are subsistence and rain fed, and with farm holdings per head in the range of less than 0.1ha to 0.61ha (Orefi, 2012; Soneye, 2014). In the face of climatic variability and rising cost of agricultural inputs and household consumables without corresponding rise in agricultural product prices, Olusola &Adenegan (2011) noted that rural farmers have adopted alternative livelihood strategies.

Since the 1970s, successive Nigerian governments have put up development programs and projects that are aimed at raising the living standard of the people, most of which were never tagged as poverty reduction programs or projects because as at the time of inception of such programs, poverty was not yet a common and prominent phenomenon in Nigeria. But because these programmes and projects were aimed at the rural areas and low-income earners such as farmers, they were later, with increasing poverty situation in Nigeria, referred to as poverty reduction programs and projects (Bolarin, 2009). Rural development was thus synonymous with agricultural development with focus on increasing agricultural production by promoting small-holder agriculture. By the early 1980s, it became more concerned with improving the economic and social life of the rural poor.

Rural livelihood has however evolved from complete dependence on farming as the sole household income source to a diversity of other income sources involving more non-farm income sources in residents' portfolio all in a bid to thus improve their standard of living (Awotide, Kehinde, &Agboola, 2010; Demurger, Fourniier, &Yang, 2009; Olusola&Adenegan, 2011).Idowu, Banwo and Akerele (2011) reported that the contribution of non-farm income sources to rural economy has grown substantially during the last two decades, with different country case studies illustrating that the share of non-farm income to total household income ranges between 20% to 50% globally, while it is between 22% and 93% in Africa.

Livelihood diversification is the process by which households construct a diverse portfolio of activities and social support for survival and in order to improve their standard of living. Livelihood strategies on the other hand, are composed of a range of activities, both the access to assets and the use to which they can be put, which Awotide, et al., (2010) suggested are mediated by social factors (social relations, institutions, organizations), exogenous trends (e.g. economic trends) and shocks (drought, diseases, floods, pests).

A variety of factors that may explain income diversification strategies that originate from movement into non-farm activities. These were examined by Dimova and Sen (2010) and broadly classified into two fundamental classes: Push and Pull factors. The former includes risk reduction, response to diminishing factor returns in any given use, land constraints driven by population pressure and fragmented landholdings, reaction to crisis and liquidity constraints, etc. In this case, income diversification is seen as a matter of necessity and survival, where diversification is born out of desperation, and driven primarily by the household's poverty status.

Pull factors on the other hand, could include the realization of strategic complementarities between activities such as crop-livestock integration or local engines of growth like proximity to an urban area, which create opportunities for income diversification in productivity and

expenditure-linkage activities. This sees diversification as a matter of choice and opportunity, involving proactive household strategies for improving living standards.

In a study on pattern of rural income diversification in Nigeria, Raphel and Matin (2009) found that farming is still the dominant income source for the poorest and richer households tend to be more diversified. They noted that diversification was not only a risk management strategy, nor a response to shrinking farm land availability; rather diversification was a means to increase overall income. Hence Dimova and Sen (2010) suggested that the diversification as 'survival' view expects that poor households will be likely to diversify more than richer households, while diversification as 'accumulation' view expects richer households to diversify more.

The implication of these is that rural dwellers especially in forest regions might tend to rely on the exploitation of forest goods and services as their non-farm income sources such as charcoal production as noted by Ajadiet al. (2012). Unfortunately, rural areas, especially in developing countries, are known to possess low levels of technology that could facilitate efficient transformation and use of natural resources, hence they tend to consume more to meet higher demands of increased population, and prices of household consumables. In fact, Adebayo (2009) suggested that poverty, population pressure, ineffective policies, and failure of market to work properly, are some of the factors that promote unsustainable exploitation of tropical forest resources.

Charcoal production in Oyo state is mainly driven by the need for an expanded income base and external financing on the supply side while on the demand side it is driven by alternative energy sourcing by importing countries (Daramola &Ayeni, 2016). Hence, there is a need for sustainability measures in a bid to ensure increased standard of living for rural dwellers. This study therefore assessed the role of non-farm sources in household income diversification in Oyo state with focus on the contribution of charcoal production and its implication for sustainable development.

THE AREA OF STUDY

Oyo state is located in the south-west region of Nigeria within longitudes 3° and 5^oE and latitudes 7° and 9^oN covering a land mass total of 27,249 km^2 (Fig. 1). Due to its latitudinal location, it enjoys an equatorial climate. The mean annual rainfall ranges from 1,117.1 to 1,693.3 mm. The rainfall pattern has a characteristic bimodal distribution with peaks usually in June or July and September and the period of low precipitation in August with four months of dry season (December – March). The annual temperature ranges from an average minimum of 24.6^{o}C toaverage maximum of 31.5^{o}C. The mean monthly relative humidity reaches a minimum of 52% in February and a maximum of 83% in August. (Erakhrumen, 2008). The topography of the state is of gentle rolling lowland in the south, but rises to a mini plateau of 40m above sea level in the north (Agboola, 1995).

The state is well-drained with rivers flowing from the upland in a north-south direction. The major rivers are Ogun, Ofiki, Shasha, Oba and Opeki. Ibarapa region is a part of the high plains of south-western Nigeria and mean land elevation varies between 100 and 150 metres above mean sea level.The natural vegetation was originally rain forest but it has been transformed into derived savannah as a result of several centuries of farming involving bush burning. (Ogundele*et al.,* 2012)

The climate and vegetation of the area favour the cultivation of cash crops such as maize, yam, cassava, millet, rice and plantain primarily but also some tree crops including cocoa, oil palm, cashew as well as a number of other cash crops. These are supported by a number of government farm settlements at Ipapo, Ilora, Sepeteri, Eruwa, Ogbomosho, Iresaadu, Ijaiye, Akufo and Lalupon. The Ibarapa region comprising Ibarapa East, Central and North local government areas was chosen as the sample site. Ibarapa East has an area of 838 km² with its headquarters in the town of Eruwa. Ibarapa Central has an area of 440 km² with Igbo Ora as its headquarters; while Ibarapa North has an area of 1,218 km² and Ayete as its headquarters.
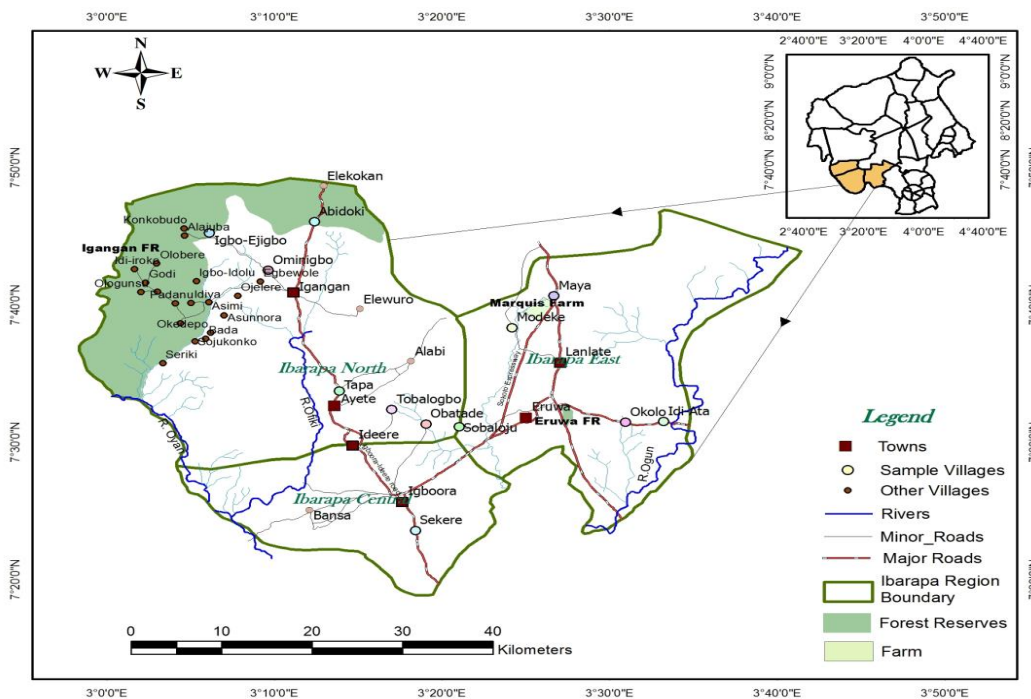
Figure 1: The Study Area

The National Population Commission estimated the population of Oyo State at 5,580,894 in 2006 and that of Ibarapa region at 322,297; comprising 163,673 males and 158,624 females. Ibarapa North was smallest with 101,092, Ibarapa Central was 102,979 while Ibarapa East LGA

was 118,226. The residents live in various types of settlements, varying from farmsteads, hamlets, villages, and towns. Primarily, the human settlement hierarchy is determined by income, economic services, settlement size, population, social amenities and functions, within the region. Traditionally, the major economic activity and means of livelihood is farming. Few agro-based cottage industries however exist including tobacco, brewing, canning, and furniture manufacturing. The Nigerian Bureau of Statistics reported a poverty rate of 51.8% for the state as at 2010 based on the World Bank poverty index criterion of less than one dollar per day per household (NBS, 2012). Prominent settlements in the state include Ibadan, the state capital and others which are becoming famous for the charcoal business either in terms of supply or demand, including Iseyin, Saki, and Okeho, Igbo-Ora, Igbeti, Ighoho, Kisi, Iganna, and Eruwa.

MATERIALS AND METHODS

Data for the study were collected through a set of multiple sources which include topographic maps and field assessment, administrative records, interviews and social survey. Participatory rural appraisal techniques of Focus Group Discussion (FGD) and structured interview/questionnaire were also adopted. Questionnaires were administered to residents of the production region and covered issues of household income sources, household energy use, and basic socio-economic characteristics. A total of three hundred and sixty (360) copies of the questionnaire were administered to households in the region. Each local government had one hundred and twenty (120) households enumerated. The stratified sampling technique was adopted wherein two (2) major towns were selected including one local government headquarter. Other settlements were chosen based on the report of the pilot survey which identified recent charcoal production areas in each local government area, geographic spread, and accessibility.

The income-based approach to household income diversification was adopted for this component. It looks at household participation in different income earning activities of the rural-environment economy. Three specific measures of diversification were focused upon as follows;

(i) Number of Income Sources (NIS)

(ii) Share of off-farm income in total income (OFS): indicates the importance of off-farm income sources in total household income.

(iii) Herfindhal Diversification Index (HDI): The Herfindahl index is traditionally used to measure the degree of industry concentration and is calculated as the sum of squares of income shares from each income source.

$$H = \sum_{i=1}^{N} s_i^2 \qquad \ldots\ldots\ldots\ldots\ldots(1)$$

Where:

S_i is the income share of source,

i in the total income,

N is the number of income sources.

As such, households with perfect specialization (having only one source of income) have a value of one. The Herfindahl Diversification Index (HDI) calculates the reverse of the Herfindahl index as one minus the Herfindahl index (1 - H). In this case, households with the most diversified income sources have the largest HDI and vice versa (Raphel&Matin, 2009).

RESULTS AND DISCUSSION

1. *Assessment of Household income generation activities:* Despite the availability of other income generating activities in the area, farming was still widely practiced significantly across spatial and income lines (Fig.2). Farming dominated household participation in Ibrapa Central and North LGAs, which had large tracts of arable land including persistent natural forest conversion to agriculture by farmers in search of virgin lands. Ibarapa East was the exception where farming turned in the second highest participation rate (64.15%) behind trade and commerce (69.81%). Eruwa and Lanlate are major towns in the region in which a number of tertiary institutions, ministries and agencies are located hence they are the major trade centers of the region.
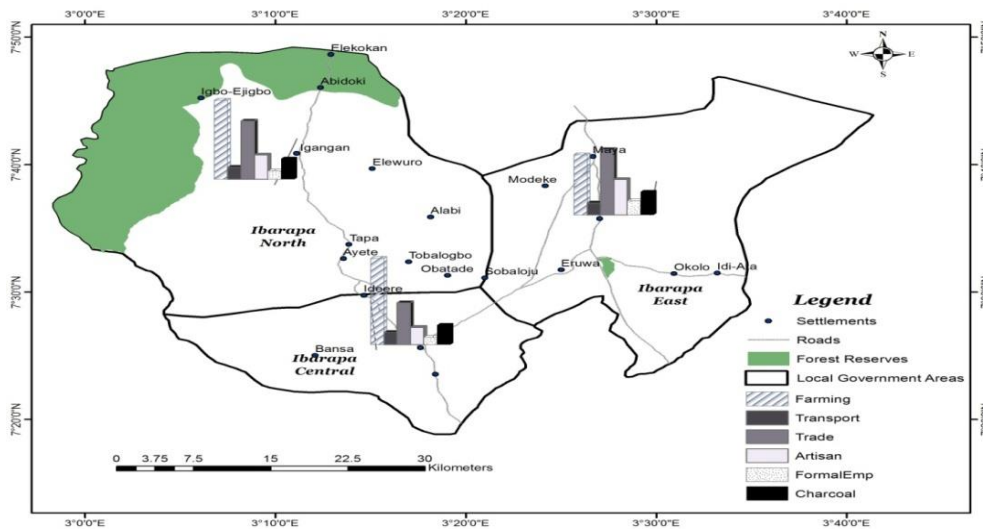

Figure 2: Rate of Participation in Economic Activities in Ibarapa Region

Source: Computed from field survey (2013)

A total of 79.8% of the respondents had household members involved in farming either as their main economic activity or as subsistence to provide for basic feeding needs, leaving about 20.2% who had none involved in farming. Trade and commerce was the second highest activity residents participated in with 60.7% rate; female members of the household were more saddled with the responsibility. The role of charcoal production was identified accordingly, where 22.6% of all sampled households, participated in charcoal production as workers, marketers, transporters, or producers. Its significance increased along income quartiles signaling a higher participation in charcoal production by the wealthier households.

It is not suffcient to know the rate of participation in economic activities but also to uderstand their contirbution to total household income. The contribution of charcoal to total household income in the region was also found to be quite uniform across income quartiles, hovering around the region average of 8.44% to make it the lowest contributor (table 1).

Table 1: Mean percentage share of activities in total household income in Ibarapa region (%)

Activity	All Households	Income Quartile			
		First	Second	Third	Fourth
Farming	31.77	74.06	36.76	28.97	27.59
Transport	10.51	1.58	12.18	10.33	11.19
Trade & Commerce	20.10	10.50	32.77	32.41	13.30
Artisan	11.97	6.34	12.39	18.26	9.75
Formal Employment	17.21	0.00	1.05	2.39	28.58
Charcoal Prod	8.44	7.52	4.83	7.65	9.58

Source: Computed from Field Survey (2013)

This is simply because it was mostly a source of additional income for households. Also less than twenty percent (20%) of charcoal retail value is retained by residents.

Three specific measures of income diversification adopted for this study; Number of Income sources (NIS), Share of Off-farm income (OFS) and Herfindhal Diversification Index (HDI) were summarized in table 3. The estimations were differentiated along income quartiles because the concept adopted was an income-based approach to diversification. Hence it was found that number of income sources increased with total household income with the exception of the third income quartile.

Table 2: Mean measures of Income Distribution

| | All Households | Income Quartile | | | |
		First	Second	Third	Fourth
Number of Income Sources (NIS)	2.20	1.80	2.29	2.16	2.64
Share of Off-Farm Income (OFS)	0.6823	0.2594	0.6324	0.7103	0.7241
Herfindahl Diversification Index (HDI)	0.7824	0.4306	0.7250	0.7606	0.7933
Total Income (Naira)	24,973	5,050	12,526	27,526	57,642

Source: Computed from survey (2013)

The share of off-farm income however increased from 0.2594 in the first quartile to 0.7241 in the fourth income quartile. This means that despite interests in farming across the income levels, the richer households had more income from their alternative sources. A Herfindhal Diversification Index (HDI) value of 0.7824 in the region shows that households generally had a high magnitude of diversification; which if well managed, could lead them out of the cycle of poverty. However, this increased also along income quartiles. The low income households with a HDI of 0.4306 were yet to break into the stream of diversification either because of inadequate disposable income or weak desire to launch out of their traditional rural systems. As is expected, average total monthly income increased from ₦5,050 in the first quartile to ₦57,642 in the fourth quartile. An average of ₦24,973 in the region shows that there are opportunities for improved livelihood strategies in the area.

2. *Rural Adaptation Cycle in Oyo State:*

The adaptation chart highlights current realities in the study area along the theme of the three pillars of sustainability: Society, Economy and the Environment. These realities must be addressed with an integrated strategy in order to attain sustainable development despite the abundance of natural resources in the region (Fig. 3).
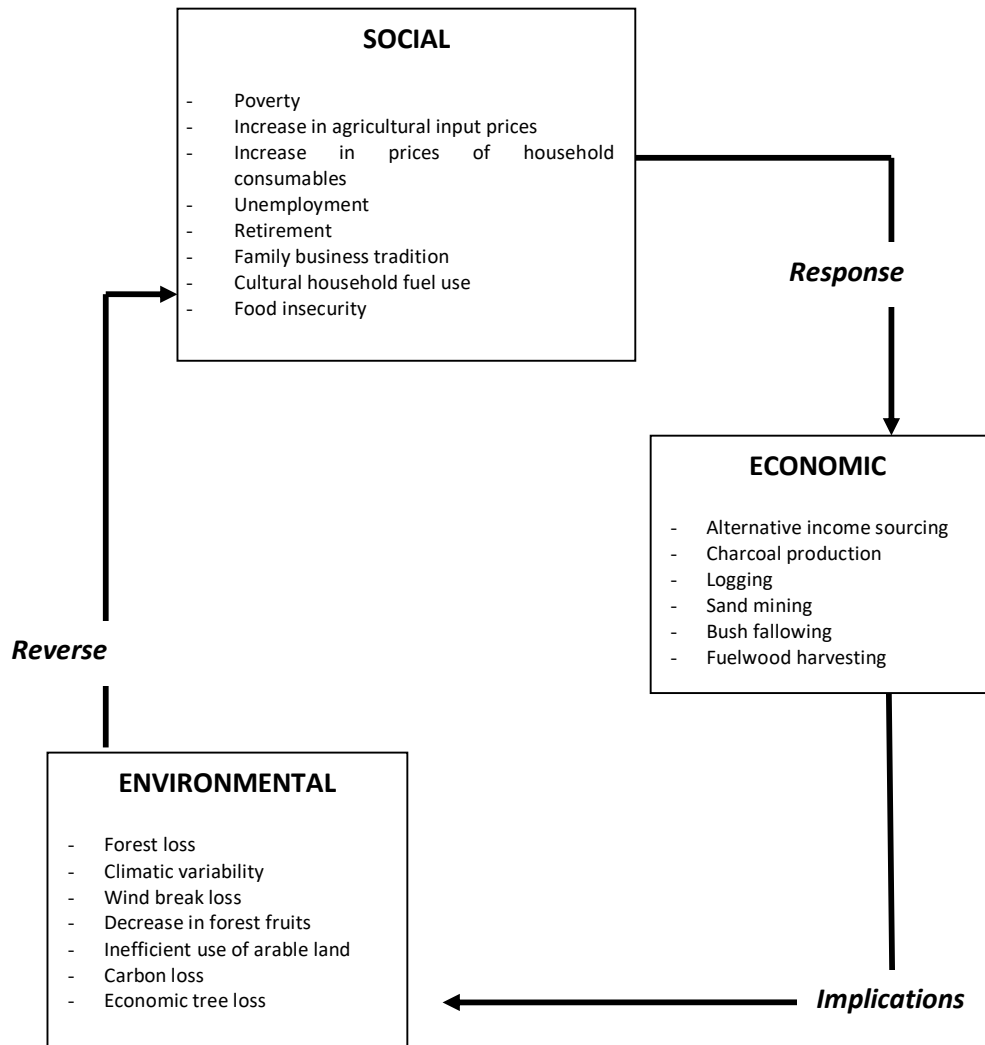
Figure 3: Rural Adaptation Cycle in Oyo State

Poverty is at the centre of the social challenges faced by rural residents in the study area. This is further compounded by increase in prices of both agricultural input and also household consumables amongst other social challenges faced by these residents. Since finance for household maintenance is at the core of these challenges, typical responses to these include attempts at seeking alternative income sources mostly as secondary income sources. In some cases, there is a total abandonment of farming for other income activities like charcoal production, logging and sand mining which guarantee quick return on investment. Also in order

to reduce cost of farm inputs, there is some foray into virgin arable lands, which are around and within gazzeted forest reserves.

These responses produce short term respite to households in the region but have some environmental implications including loss of natural forests, economic trees like the shea butter tree, wind break and carbon sequestering services. This inefficient use of arable land and resulting climatic variability naturally leads to renewed challenges for these rural farmers.

CONCLUSION

Addressing the challenges of rural livelihood in Nigeria must be beyond the conventional focus on agriculture as the indicator of rural development. Sustainable development in rural areas must also involve non-farm activities. The rate of charcoal production in Ibarapa region of Oyo state calls for immediate action. One of such is definitely not a ban on production as this has been found to be counter-productive, giving rise to higher levels of informal production and prices. Rather it is expedient to ensure that economic responses to identified social challenges are carried out with minimal environmental degradation to reduce the risk of a recurring cycle.

The following recommendations are made to achieve the needed break out from this cycle:

1. Facilitation of improved agricultural production systems in the region to ensure the optimum use of available land without a foray into forest reserves.

2. Improvement of the agricultural supply chain to reduce losses accruable on produce so as to guarantee better sales and eventually increased food production.

3. Development and inclusion of climatic models in agricultural extension services to guide farmers on appropriate planting seasons.

4. Formalization of the charcoal production sector to ensure regulation of production activities, and guarantee access to credit facilities needed to establish feedstock plantations, and switch to higher efficiency kilns or retorts.

5. Encouragement of other sustainable economic activities which will reinforce forest management efficiency.

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