

**DYNAMICS OF POVERTY, DEFORESTATION AND BEEKEEPING IN
NORTHERN NIGERIA: CONCERN FOR POLICYMAKERS - PART II****Muhammad Rabi'u JA'AFAR-FURO**Department of Agricultural Economics and Extension
Adamawa State University, PMB 25, Mubi, NIGERIA**ABSTRACT**

Poverty and deforestation, reforestation and beekeeping are seemingly interrelated. While the Federal Government of Nigeria (FGN) seemed to be fielding aggressive programmes towards promotion of afforestation as a measure of minimizing deforestation, and the level of poverty still remaining at the lowest extreme, the supposedly beekeeping projects that can serve as a bridging strategy has been neglected. This study investigates the dynamics between the very poor livelihoods of the people of northern Nigeria, reforestation programmes of the FGN and promotion of apiculture as a strong link for stabilization of the economy in the area. Information was mainly gathered from secondary sources, but primary data were obtained using structured questionnaire served beekeepers. Descriptive statistics, apiary net return and computation of values were applied in the analysis of the data. Results show that the rate of poverty is higher in the northern parts of Nigeria where the livelihoods of the people are heavily depended on utilisation of forest resources, thereby leading to massive deforestation. In addition to documenting that beekeeping is largely indigenous in practice in the region, the application of the farming system in regaining vegetative cover through reforestation has been broadly explored. Although it can be stated that the poor livelihoods of the people of the northern parts of the country had direct link with utilisation of the forest resources, it is expected that the policymakers should use the available information in rectifying the anomalies towards improving the status of the people of the area economically.

Keywords: Beekeeping, bees, deforestation, dynamics, Nigeria, poverty.

INTRODUCTION

Although it has been consistently and widely propagated in the Nigeria's media that the country is ranked the first in Africa and sixth in the world in terms of oil and gas/petroleum production, Hillsberg (2014) could not mention Nigeria among the top 10 oil/petroleum producing countries in the world. These nations listed in descending order, according to the author, include Saudi Arabia with 11.75 million barrels per day (bpd), United States (10.95m bpd), Russia (10.30m bpd), China (4.19m bpd) and Iran (4.13m bpd). Others were Canada, United Arab Emirate, Mexico, Brazil and Kuwait producing 3.92, 3.23, 2.95, 2.80 and 2.75 million bpd, respectively. However, given an appreciable figure of 2.2m bpd for the largest populous nation on the black continent coupled with a current Foreign Reserve of US\$49 billion (World Bank, 2013) and Gross Domestic Product (GDP) of US\$510 billion (Daily Independent, 2013), the inference is that the country is well positioned to be one of the economically advantaged nations in the world in terms of provision of basic human needs and essential services to its citizenry like functional education, good health facilities, reliable infrastructure and balanced nutrition, among others.

Nevertheless, authors like Iyang and Esohe (2014) reported that about 45.00% of the country's teeming populace survives below the poverty line. This is more worrisome when earlier report from NBS (2012) showed statistics for 2009/2010 Harmonised Nigeria Living Standard Survey (HNLSS) in which the Northern States of Nigeria were classified as the

poorest. Similarly, in two separate successive studies in the area under consideration, Amaza *et al.* (2008) and Kwaghe and Amaza (2009) captured the glooming state of poverty among the majority farming households. While in the former, basing their study on mean Monthly Per Adult Equivalent House Expenditure (MPAEHE), the findings indicated that about 67.00% of the households were living below the accepted international poverty line of US\$1 per day, the latter survey showed that about 62.00% of the farming households were poor using the MPAEHE by deciles. Therefore, given this scenario, the incidence of poverty in the Northern Nigeria is alarming, to say the least.

Several reports in the past have indicated that there is an established positive correlation between the level of poverty and utilisation of forest resources leading to deforestation and other exploitations. For instance, Johda (2000) associated the rural poor households in developing economies to overdependence on natural resources for their subsistence. This practice is more pronounced in Nigeria where the country, in the account of FAO (2005), was having the highest rate of deforestation in the world. This finding was corroborated by the report of IITA (2011), in which the organisation rated the nation the worst on earth in terms of deforestation. Going by these stunning revelations, it could be stated that deforestation is a catastrophe in the country, and requires synergistic efforts of all stakeholders (members of rural communities, government and non-government organisations, and corporate bodies, among many) in reversing the negative trend. While deforestation processes have been on the increase, desirable measures toward curtailing the menace by both government and private institutions have been neglected. Similarly, Ladan (2013) expressed the same opinion in his study of energy-environment interaction in Northern Nigeria where he documented that the demand and usage of wood for cooking, heating and small-scale industrial purposes were the major causes of deforestation the area. Also, Boafu (2013) capped it all in a report of impact of deforestation on forest livelihoods in Ghana, giving a worrisome state of forest loss in Africa that 90.00 % of its population use fuel wood and charcoal as sources of energy, accounting for 2/3 of the people of the continent depending on forest resources for income and food supplements.

Reversing the processes of deforestation in any given country demands maximum commitments, first, from the public sector and then total reorientation of the minds of the whole citizenry/system towards adoption of massive afforestation/reforestation practices in regaining the vegetative cover. In other words, creating awareness programmes with the hope of educating the populace in supporting consistent establishment of shelterbelts across all the prone areas or zones. The FGN had in the past embarked on afforestation/reforestation programmes in order to curtail desertification that has been claiming arable land at the rate of one kilometer yearly in Northern Nigeria. While both Ladan (2013) and Inyang and Esohe (2014) reported that these programmes have not been successful due to the inability of the authorities to provide alternative sources of energy like hydropower, solar and wind that are renewable to the poor people of Nigeria, Ja'afar-Furo (2014) suggested incorporation of income generating projects that can support the livelihoods of the majority of the poor and make them less dependent on forest resources and also beneficial to the entire biodiversity. In this regard, the author strongly advanced the adoption of apiculture or beekeeping into such afforestation/reforestation programmes as the required remedy, among many others.

The immense role bees play in stabilising the ecosystem is enormous, and widely captured in the literature. According to Alleyne (2010), a shortfall in number of bees coupled with global warming are exhibiting some damaging effects on pollination of plants and by extension their population. In a similar report, Pensoft Publishers (2012) observed that two-third of the crops

used by humans for food production and majority of wild plant species depend on pollination by insects that are mostly bees and hoverflies. While Grossman (2013) maintained that the declining bee populations pose a threat to global agriculture and other numerous species of wild plants, FAO (2014) reported that bees play an important, but little recognized role in most terrestrial ecosystems where there is green vegetation cover for at least 3 to 4 months each year. This is particularly pronounced in tropical forests, savannah woodlands, mangrove, and in temperate deciduous forests. And the report concluded that the existence of many species of plants and animals would not be possible if bees were not available.

All these reports strongly affirmed that bees are central to a sustainable coexistence in an ecosystem. In other words, there can never be a stable biodiversity without bees as major pollinators. Therefore, as bees pollinate the diverse plants which provide vegetative cover required for afforestation/reforestation projects, the plants in turn provide support to numerous living creatures in the wild, and also the humans for their livelihoods. It is against this background that this study attempted to establish the relationship between bees and income generation on one hand, and then bees and pollination on diverse plants on another, with the hope that policymakers would learn few lessons on sustainable afforestation/reforestation projects.

METHODOLOGY

The Study Area

The study covered the nineteen States and Federal Capital Territory (FCT) that made up the Northern Nigeria, namely Adamawa, Bauchi, Benue, Borno, Gombe, Jigawa, Kaduna, Kano, Katsina and Kebbi. Others are Kogi, Kwara, Nasarawa, Niger, Plateau, Sokoto, Taraba, Yobe and Zamfara. Ladan (2013) reported that the whole area covers about 60.00% of Nigeria's landmass of 723,800 square kilometer, and accounting for about 52.57% of the total national population of 170 million.

Sampling and Data Collection

The North-East region comprising Adamawa, Bauchi, Borno, Gombe, Taraba and Yobe States were purposely selected from the 19 States for the study because of the nature of the area as the most desertification-prone zones, as well as housing two of the most poorest States (Adamawa & Yobe) in the nation. Primary data were mainly collected from beekeepers who were also crop producers. As the study was largely based on reviewed literature, the use of questionnaire was complemented with interview sessions and Focus Group Discussions (FGDs) to generate qualitative and quantitative data. The major informants were the beekeepers who were also Farming Households (FHHs).

As beekeepers were limited in number coupled with insecurity situation of the area under consideration as a result of activities of insurgents, 30 respondents were proposed from each State for the study, giving a total of 180. However, 120 respondents participated fully in the end. The remaining 60 were either relocated or could not be accessed. .

Method of Data Analysis

Computations of figures, descriptive statistics and Net Return (NR) to investment were applied in realising the results. While secondary information were used to achieved poverty

rates by zones in the country, fuelwood utilisation in same, the profitability of beekeeping in the study area was realised using the NR to enterprises. Thus:

$$NR = \sum P_i V_i - (FC + VC)$$

Where:

NR = Net Return to apiaries in naira

P_i = Unit price of beehive products in naira

V_i = Quantity of beehive products sold in naira

FC = Fixed Costs of apiaries in naira (Is arrived at using straight line depreciation)

VC = Variable Costs of apiaries in naira

DISCUSSION OF THE FINDINGS

This section of the study presents primary findings of this study, and others obtained in the literature in tabular form and figures, and discusses same, relating the findings to other results obtained elsewhere for comparison in order to validate the works or otherwise.

The current rate of poverty in Nigeria by zones

It has been severally reported (IFAD, 2012; Ukpong *et al.* 2013; World Bank 2014) that Nigeria is the most populous black nation in the world with figures of 170 million being projection from the 2006 National Census. In spite of the huge resources (oil, gas & others) accrued to the nation, the larger chunk of the population still live below the conventionally accepted poverty line of US\$1 per day. Esohe (2014) noted that the larger part of this people is located in the Northern aspect of the country. This scenario is reflected in Table 1. The findings are based on the GHS conducted by the National Bureau of Statistics (NBS) expressed in percentage, and the author's computation of population in millions. It could be seen from the findings in the Table 1, that from the year 2010/2011, the population of people living in poverty has been enormous. Specifically, the Northern zones of the country accounted for larger proportions of persons under poverty threshold with North-East, North-West and North-Central recoding 47.1%, 46.9% and 33.4%, respectively. However, although the poverty trend was also experienced in the southern parts of the country, on a comparative basis, it was milder within the stipulated period. The South-East recorded 31.7% as a chunk of the population under the poverty hold, 27.7% was accounted for by the South-South zone, and the South-West zone had 21.2% as the least in the country.

Going by the record of scoresheet of revenue of Nigeria for the year 2013, one cannot but expect a remarkable shift from the position of poverty experienced previously to a more acceptable level. However, values in Table 1 for 2012/2013 indicated that there has not been a significant improvement. In fact, in the North-East part of the country, an increase of 3.1% was recorded being the highest in the country. This negative development could be linked to the rampant attacks on some parts of Adamawa, Borno, Gombe and Yobe States by the insurgents that rendered the areas unproductive in terms of agricultural production as the major economic activity, and also trading. Apart from the issue of insecurity, there has not been any significant measure taken by either the public or private sector as poverty reduction or a positive transformation agenda. But in the Southern parts, and specifically the South-

Table 1: Poverty Rate Per Capita in Nigeria by Zones

Zone	GHS		GHS		Difference (%)
	Poverty Headcount		Poverty Headcount		
	2010-2011 (%)	2010-2011 (m)	2012-2013 (%)	2012-2013 (m)	
North East	47.1	19.0	50.2	20.2	3.1
North Central	33.4	20.3	31.1	21.6	-2.3
North West	46.9	37.8	45.9	40.1	-1.0
South East	31.7	16.4	28.8	17.5	-2.9
South South	27.7	21.0	24.4	22.3	-3.3
South West	21.2	33.6	16.0	35.7	-5.2

Note: GHS= General Household Survey.

m = Population in millions.

Source: NBS (2013) in World Bank (2014), Author's computation (m).

West and South-South, a remarkable reduction in the number of people living under poverty has been recorded, with 5.3% and 3.3%, respectively.

Forest resources utilisation and the determinants in northern Nigeria

Forests in developing countries play significant role in the livelihoods of both rural and urban communities. Several authors' opinions have been consistently agreeing on reporting the aspect of forest resource utilisation in developing economies, particularly in Africa. For instance, MacGregor *et al.* (2007) reported that their survey on understanding the current utilisation of forest resources at household level in Namibia indicated that demand for these resources has been mainly for energy, food, shelter and retail purposes. In addition, medicines and cosmetics are also derived from plant products. Similarly, Tom (2010) emphasized on the significant role forests provide in maintaining and improving the productivity of agricultural land as well as sustaining ecological balance in agrarian communities. In a more elaborate term, Momodu (2013) maintain that a forest product, wood, has been a major source of energy for many countries across the globe, more especially developing countries worldwide, and associated this trend to poverty and inadequate knowledge of required technology in sourcing for better alternative of fuel/energy.

Table 2: Fuelwood Consumption Pattern in Nigeria (1997-2006: '000 M³)

Year	Total Production	Household Consumption	Percentage of Total Production	Industrial Consumption
1997	152433	110194	72.3	31069
1998	156500	113134	72.3	31897
1999	156516	113145	72.3	31901
2000	160272	115861	72.3	32666
2001	163959	118526	72.3	33418
2002	167973	121428	72.3	34236
2003	172098	124410	72.3	35077
2004	175884	127147	72.3	35848
2005	179754	129944	72.3	37789
2006	185357	133981	72.3	37789

Source: ESD/UNSD (2008), in Momodu (2013).

Reflecting on the findings in table 2, it could be observed that there has been a huge consistency in both the national production and consumption of fuelwood in the country from the year 1997 to 2006. Within the stipulated period, industrial consumption accounted for only 20.38% while the remaining 79.62% was for the domestic consumption, thereby indicating a heavily dependence on forest resources for livelihoods by the larger population. This development can be said to be largely attributed to the impoverishment situation of the people, which is appropriately captured by Hyde (2004) who stated that forests and poverty go hand in hand, and where one is found, there is often the other. In other words, the larger percentage of poor population lives in rural area that is forested. The author gave an instance of China in which over 90.00% of its poor population is found in such remote areas, and about 496 of 592 officially designated poverty stricken counties are in mountainous, forested regions.

Further to above, Onoja and Idoko (2012) and Onoja and Emodi (2012), in separate studies, attributed the larger demand and utilisation of fuelwood by rural to its affordability in terms of pricing of the product and level of income of consumers which is heavily hinged on the poverty level of the people. In a related development, Na'ibbi and Heady (2013), Akwa (2013) and Ibe (2014) all affirmed that in spite of the fact that income, prices of fuelwood and its substitutes are major determinants of the consumption of fuelwood in the north, there was uniformity in reporting that the larger population are still mainly relying on this source of energy for most of their domestic uses. To be more specific, Na'ibbi and Heady (2013) associated the trend to denial of the majority of the northern states of sufficient fossil fuel, which is closely correlated with the people's dependence on traditional fuels (fuelwood), leading to considerable pressure on the region's scarce vegetation resources.

Be that as it may, the fact remains that poverty is more prevalent in the Northern parts of Nigeria than any other part, and even in the North, the North-east and North-west are the most hit. And majority of the population heavily depend on forest resources for their livelihoods without replenishing through sustainable management practices. This singular act results into massive degradation on both the top soil used for agricultural purposes and dense vegetation cover. The question that boils on most minds of most environmentalists is what is the way forward? Authors like Sunam and Paudel (2012) and Gencan and Atmis (2014) in similar experienced situations, linked it to formulation of appropriate or sustainable forestry policymaking.

The role of beekeeping in reduction of poverty among farming communities, and its linkage with forest development

In making attempts to reduce the rate of poverty in Nigeria, successive Federal Governments of the country had fielded several programmes in the past as measures toward economically empowering the larger chunk of the population that lived or has been living below the poverty line (US\$1.00) for years. Numerous authors (Omotola, 2008; Oshewolo, 2010; Ogunleye, 2010; Alese, 2013) have agreed that these efforts could not yield any meaningful results for which they were intended. Chigozie and Ituma (2014) reported that these programmes are many and include more than twenty such poverty alleviation/eradication measures. They range from National Directorate for Employment (NDE), Peoples Bank of Nigeria (PBN), National Commission for Nomadic Education (NCNE), National Agricultural Land Development Agency (NALDA) to a more recently established National Fadama Development Programme III (NFDP III). Ogunleye (2010) associated the failure of these policies to largely the negative role of globalization in the economy of the country, income

disparities among the citizenry, neglect to agriculture, gender imbalance with regard to access to economic resources, massive corruption, just to state a few. But more importantly is the fact that these listed poverty reduction measures have always been tailored toward addressing the human development inadequacies without taking into cognisance of their sustainability nature. Okosun *et al.* (2012) and Kanayo *et al.* (2013) suggested that the remedy lies in enforcing policies that inclined towards economic, social and environmental sustainability. And since the larger population of Nigerians depend on agriculture and forest resources for their livelihoods, promoting an enterprise that connects the three segments becomes imperative. In this context, Lietaer's (2015) work strongly endorsed the utilisation of bees (Apiculture/Beekeeping).

While Rai and Mauria (2006) described apiculture as the science and culture of honeybees and management and in a broad sense include unsocial and solitary bees, their biology, behaviour and entire production, beekeeping entails rearing of domesticated honeybee species and their management. In other words, apiculture is broader in spectrum and encompasses the study of both domesticated and wild honeybees. However, the two farming systems are mostly interchangeable in the literature and therefore, could be used so in the context of this study.

The role of bees in generating immense income for the keepers, serving as raw materials for industries, apitherapy for those possessing the knowledge, preservation of ecosystem through pollination, and accruing huge foreign earning for nations exporting such products, abound in the literature, Lietaer (2015) noted that these are often not fully appreciated by forestry departments and policymakers. This could largely be linked to ignorance on the part of the authorities concern. For instance, while numerous authors (Ja'afar-Furo *et al.*, 2006; Onyekuru *et al.*, 2010; Fakayode *et al.*, 2010; Mbah, 2012; Onwumere *et al.*, 2012; Folayan and Bifarin, 2013) assessed the economic status of beekeeping in Nigeria, in some African countries (Alujuni *et al.*, 2012; Gameda, 2014; Aboud, 2014; Gebiso, 2015) and western world (Sanford, 1998; Stafford and Stoner, 2009; Brownlee, 2012; Bond *et al.*, 2014), the outcome all indicated that the farming system in the continents was profitable, supports agriculture and environment, and above all, possess remarkable potentials for sustainability in supporting livelihoods in its diverse sense.

The above findings are further supported by a recent result of survey in tables 3 and 4, respectively. The result in table 3 indicates distribution of apiarists according to states in the North-East geo-political zone of the country. A larger proportion (22.50%) of the respondents was from Taraba. This was followed by Adamawa (20.83%), and Gombe and Bauchi with 18.33% and 16.67%, respectively. Borno and Yobe trailed with 12.50% and 12.50%, respectively. The low number of respondents from Borno and Yobe States could strongly be linked to the activities of insurgents which made much population to either relocate to safer areas temporary or abandoned the locality for the sake of insecurity.

Table 3: Distribution of Apiarists According to States

State	frequency of Farmers	Percentage (%)
● Adamawa	25	20.83
● Bauchi	20	16.67
● Borno	15	12.50
● Gombe	22	18.33
● Taraba	27	22.50
● Yobes	11	9.17
Total	120	100.00

Source: Computed from field data (2013).

Results in table 4 show NR to apiaries for the period under survey, with only two beehive crops (honey and beeswax) as major products realised by the apiarists. Of the NR of ₦2,371,540 for the 120 apiaries in the study area, honey accounted for the major chunk (94.81%), with beeswax recording only 5.19%. This gave an average NR of ₦19,762.83 (₦2,371,540/120) per apiary for a cropping season. Going by the number of 2-3 beehives per apiary (276/120), the enterprise is considered as highly profitable taking into account the level of poverty in the zone. It should be noted that the value of NR did not include other beehive crops which are probolis, bee venom, and royal jelly and, in some instances, pollen grains commonly known as bee bread.

Table 4: Return on Apiaries in the North-East Geo-Political Area (n: 276 beehives)

Beehive Crop	P ₁ (₦)	V ₁ (Ltrs/Kg)	FC (₦)	VC (₦)	NR (₦)
• Honey	1200	2842.8 Ltrs	22,800	1,140,000	2,248,560 (94.81)
• Beeswax	550	223.6 kg	-	-	122,980 (5.19)
Total					2,371,540 (100)

Note: Values in parentheses are percentage of total.

: US\$1 = ₦170 (As at the time of study).

Source: Computed from field data (2013).

As pollination services rendered by honeybees surpassed the value of all beehive crops put together in the US by a factor of 50 (Morse and Calderone, 2000), and Jacobs *et al.* (2006) strong empirical endorsement as the enterprise fitting well into tripod of sustainable agriculture by serving the economical, ecological and social objectives, bees are certainly the perfect creatures for advancing the course of afforestation.

In the triangular objectives of Jacobs *et al.* (2006), the economic stand point of view entails bees providing sufficient income generation for both the rural and urban poor, through the sales of beehive crops for nutritional, medicinal, industrial uses and intense pollination services. The ecological role guarantees healthy natural resources for the future generations, by pollination of both agricultural crops and wild plants of diverse species leading to a stable ecosystem. And the social function allows all social stratifications, particularly the impoverished persons, to gain a livelihood under good working conditions. These strong linkages provide a central role for honeybees as possessing sustainability attributes in environmental preservation.

From the above stated roles of honeybees, utilisation of the enterprise in the current Federal Government of Nigeria's shelter belt afforestation programme would not only solve the issue of poverty among the beneficiary communities, but also assist in rapid regeneration of vegetative cover thereby maintaining a stable ecosystem. However, in the report of FGN (1999) on combating desertification and mitigating the effects of drought in Nigeria prepared for the United Nations Convention to combat desertification in those countries experiencing serious drought and/or desertification, particularly in Africa, several strategic plans were listed which could not clearly define any grass root livelihoods project.

Among such strategies and action plans are the Nigerian National Environmental Action Plan (NEAP), State Environmental Action Plan (SEAP), National Forestry Action Plan (NFAP), National Conservation Strategy (NCS), National Water Resources Master Plan (NWRMP), National Biodiversity Strategy and Action Plan (NBSAP) and the Green Agenda. Of these action plans, SEAP specifically seeks to integrate socio- economic and ecological perspectives in to all the States' policies, plans and programmes as well as those of all

stakeholders and interests groups within the State. However, these stated plans are mostly in principles, and largely deficient in practice. That is the reason why these numerous policies and action plans, although beautifully tailored to address desertification and other land degradation cases in affected areas, yet always experiencing colossal failure in the country, particularly in the Northern parts that are worst hit.

CONCLUSION AND POLICY IMPLICATIONS

It could be concluded from the results of this survey that poverty is more pronounced in the Northern parts of Nigeria and majority of the population rely heavily on wood fuel as a source of energy leading to high incidences of desertification and land degradation. In spite of the huge efforts of the FGN in formulating policies and action plans to address these inadequacies, the menace still persist due to poor implementation strategies. Afforestation programmes that capture the socio-economic aspect of stakeholders and interest groups are merely in principles and shallow in practice.

From the foregoing, it is imperative that the FGN should formulate policies that would make fossil fuel available to the teeming population in order to lessen the pressure on forest resources. Afforestation programmes should incorporate livelihood projects that could provide sustainable income to the beneficiary communities, as well stabilize the ecosystem as in the case of beekeeping. Implementation of government policies should strictly be in conjunction with stakeholders' representatives to ensure accuracy and accountability. Finally, powerful independent monitoring groups should be instituted to ensure that afforestation policies are executed according to laid down plans.

REFERENCES

- Ahmed, A. (2014). Cost Structure and Return on Investment in Apiculture for Honey and Beeswax Production in the Mampong Ashanti Municipality of Ghana. <http://www.academia.edu/9081293/>. Accessed 07/11/2015
- Akwa, L.; Marcus, N. D. and Rahman, S. A. (2013). Analysis of Fuelwood Utilisation among Rural Women in Akwanga Local Government Area, Nasarawa State, Nigeria. *Abuja Journal of Geography and Development*. 3(2): 1-8
- Alese, O. D. (2013). Women and Poverty Alleviation Programmes in Nigeria: The NAPEP Approach. *Academic Journal of Interdisciplinary Studies*. 2(3): 515-521
- Alleyne, R. (2010). Bee Decline Already Having Dramatic Effects on Pollination of Plants. Retrieved on 03/10/2014 from <http://www.telegraph.co.uk/science/science-news/7980954/Bee-decline-already-having-dramatic-effect-on-pollination-of-plants.html>
- Amaza, P. S.; Adejobi, A. O. and Kwaghe, P. V. (2008). Poverty and its Determinants among Farming Household in West Africa: Empirical Evidence from Borno State, Nigeria. *Journal of Food, Agriculture and Environment*. 6(3&4): 406-411
- Boafo, J. (2013). The Impact of Deforestation on Forest Livelihoods in Ghana. Africa Portal: Backgrounder No. 49 January. 7pp
- Bond, J.; Plattner, K. and Hunt, K. (2014). Fruit and Tree Nuts Outlook: Economic Insight. <http://www.ers.usda.gov/media/1679173/special-article-september-pollinator-service-market-4-.pdf>. Accessed 09/11/2015
- Brownlee, N. (2012). The Importance of Honeybees to North Carolina's Economy. <https://roberson.ces.ncsu.edu/2012/03/the-importance-of-honey-bees-to-north-carolinas-economy/>. Accessed 08/11/2015

- Charlotte Lietaer (2015). Impact of beekeeping on forest conservation, preservation of forest ecosystems and poverty reduction. <http://community.eldis.org/.59d3bb5d/Lietaer>. Accessed 05/11/2015
- Chigozie, C. F. and Ituma, O. S. (2014). New Partnership for Africa's Development and Challenges of Poverty Alleviation in Nigeria. *IOSR Journal of Humanities And Social Science*. 19(11): 13-21
- Ebe, F. E. (2014). Socio-economic Factors Influencing the Use of Fuelwood in Urban Areas of Enugu State, Nigeria. *OISR Journal of Business and Management*. 16(11): 147-151
- Fakayode, S. B.; Babatunde, R. O.; Olowogbon, S. T, and Adesuyi, W. S. (2010). An Appraisal of Beekeeping Activities among Beneficiaries and Non-Beneficiaries of Ekiti State Agricultural Credit Agency (ESACA) Scheme in Nigeria. Paper presented at the Joint 3rd African Association of Agricultural Economists (AAAE) and 48th Agricultural Economists Association of South Africa (AEASA) Conference, Cape Town, South Africa. September 19th - 23th
- Federal Government of Nigeria, FGN (1999). Combating Desertification and Mitigating the Effects of Drought in Nigeria: A Report Submitted at the Third Session of the Conference of the Parties, Recife, Brazil, November, 1999. 33pp
- Food and Agriculture Organisations, FAO (2005). Annual Rate of Deforestation. Retrieved on 25th February 2014 from http://green.wikia.com/wiki/Deforestation_in_Nigeria.
- Food and Agriculture Organisations, FAO (2014). The Importance of Bees in Nature. Retrieved on 03/10/ 2014 from <ftp://ftp.fao.org/docrep/fao/012/i0842e/i0842e04.pdf>
- Folayan J. A. and Bifarin J. O. (2013). Profitability analysis of honey production in Edo North Local Government Area of Edo State, Nigeria. *Journal of Agricultural Economics and Development* 2(2): 60-64
- Fonta, W. M. and Ayuk, E. T. (2013). Measuring the role of forest income in mitigating poverty and inequality: evidence from south-eastern Nigeria. *Forests, Trees and Livelihoods*. 22(2): 86-105
- Gebiso, T. (2015). Adoption of Modern Beehive in Arsi Zone of Oromia Region: Determinants and Financial Benefits. *Agricultural Sciences*. 6: 382-396
- Gencan, G. and Atmis, E. (2014). Local Reflections of Forestry Policies in Early Years of Turkish Republic (The Case of Bartın Newspaper). *Journal of the Faculty of Forestry Istanbul University*. 64(2): 1-13
- Grossman, E. (2013) Declining Bee Populations Pose a Threat to Global Agriculture . Retrieved on 03/10/2014 from http://e360.yale.edu/feature/declining_bee_populations_pose_a_threat_to_global_agriculture/2645/
- Hillsberg, A. (2014). Top 10 oil Producing Countries in the World: Where's the Greatest Petroleum Dominion? Retrieved on 31/07/2014 from <http://financesonline.com/top-10-oil-producing-countries-in-the-world-wheres-the-greatest>.
- Hyde, W. F. (2004). Forest Development and its Impact on Rural Poverty. <http://www.researchgate.net/publication/228811052>. Accessed 12/09/2015
- International Fund for Agricultural Development, IFAD (2012). Enabling Poor Rural People to Overcome Poverty in Nigeria. Retrieved on 14/11/2014 from <http://www.ifad.org/operations/projects/regions/pa/factsheets/ng.pdf>
- International Institute of Tropical Agriculture, IITA (2011). Deforestation: Nigeria ranked worst in the World. Retrieved from <http://www.thisdaylive.com/articles/deforestation-nigeria-ranked-worst-in-the-world/103321/>
- Inyang, M. P. and Esohe, K. P. (2014). Deforestations, Environmental Sustainability and

- Health implications in Nigeria: a review. *International Journal of Science, Environment and Technology*. 3,(2): 502 – 517
- Ja'afar-Furo, M. R.; Sulaiman, A. and Hong, Y. E. (2006). A Comparative Analysis of Beekeeping and Crop Production in Adamawa State, Nigeria. *Apiacta*. 41: 44-53
- Ja'afar-Furo, M. R. (2014). Dynamics of Poverty, Deforestation and Beekeeping in Northern Nigeria: Concerns for Policymakers Part I. *Scientific Papers Series: Management, Economic Engineering in Agriculture and Rural Development*. 14(2): 179-186
- Jacobs, F. J.; Simoens, C.; de Graaf, D. C. and Deckers, J. (2006). Scope for non-wood forest products income generation from rehabilitation areas: focus on beekeeping. *Journal of the Drylands* 1(2): 171-185
- Johda, N. S. (2000). Common Property Resource and the Dynamics of Rural Poverty: Field Evidence from Dry Regions of India. In: Hyde, W. and Amacher, G. S. (eds.), *Economics of Forestry and Rural Development-An Empirical Introduction from Asia*. University of Michigan Press, USA.
- Kanayo, O.; Kizito, E. U. and Udefuna, P. (2013). The Challenges and Implications of Sustainable Development in Africa: Policy Options for Nigeria. *Journal of Economic Cooperation and Development*. 34(4): 77-11
- Kwaghe, P. V. and Amaza, A. S. (2009). Poverty Status and it Relationship with Environmental, Health-Related and Living Condition Factors among Farming Households in Borno State, Nigeria. *Journal of Food, Agriculture and Environment*. 7(2): 823-828.
- Ladan, S. I. (2013). Energy-Environment Interaction: Case Study of Northern Nigeria. *Advance in Electronic and Electric Engineering*. 3(6): 691-700.
- MacGregor, J.; Palmer, C. and Barnes, J. (2007). Forest Resources and Livelihoods in the North-Central Regions of Namibia. International Institute for Environment and Development's Environmental Economic Programme Discussion Paper 07-01. 28pp
- Masuku, M. B. (2013). Socio-economic Analysis of Beekeeping in Swaziland: A Case Study of the Manzili Region, Swaziland. *Journal of Development and Agricultural Economics*. 5(6): 236-241
- Mbah, S. O. (2012). Profitability of Honey Production Enterprise in Umuahia Agricultural Zone of Abia State, Nigeria. *International Journal of Agriculture and Rural Development*. 15 (3): 1268-1274
- Momodu, M. I. (2013). Domestic Energy Needs and Natural Resources Conservation: The Case of Fuel Consumption in Nigeria. *Mediterranean Journal of Social Sciences*. 4(7): 147-153.
- Morse RA and Calderone NW (2000): The value of honey bees as pollinators of U.S. crops in 2000. *Bee Culture*.
- Mujuni, A.; Natukunda, K. and Kugonza, D. R. (2012). Factors affecting the adoption of Beekeeping and Associated Technologies in Bushenyi District, Western Uganda. *Livestock Research for Rural Development*. Volume 24, Article No. 133. <http://www.lrrd.org/lrrd24/8/muju24133.htm>. Accessed 07/11/2015,
- Na'ibbi, A. I. and Heady, R. G. (2013). Northern Nigeria's Dependence on Fuelwood: Insights from Nationwide Cooking Fuel Distribution Data. *International Journal of Humanities and Social Sciences*. 3(7): 160-173
- National Bureau of Statistics, NBS (2012). The Nigeria Poverty Profile 2010. The Nigeria Handbook, 14th Edition.
- Okosun, I.; Siwar, C.; Hadi, A. S. and Nor, A. R. M. (2012). Urban poverty in Nigeria and approaches to poverty alleviation: A review. *African Journal of Political Science and International Relations*. 6(1): 8-14,

- Oloyede, I. O. (2008). Afforestation and Reforestation: The University of Ilorin Experiment. Being a Presentation at the High Level Technical Workshop on Afforestation and Climate Change in Africa. Organised by the Centre for Human Security of the Olusegun Obasanjo Presidential Library (OOPL) & Nigeria Tree Planters. 15th – 17th December
- Omotola, J. S. (2008). Combating Poverty for Sustainable Human Development in Nigeria: The Continuing Struggle. *Journal of Poverty*. 12(4): 496-517.
- Onoja, A. O. and Emodi, A. I. (2012). Economic Analysis of Fuelwood Production and Consumption: Evidence from a Nigerian State. *British Journal of Management and Economics*. 21(1): 13-23
- Onoja, A. O. and Idoko, O. (2012). Econometric Analysis of Factors Influencing Fuelwood Demand in Rural and Peri-Urban Farm Households of Kogi State, Nigeria. *Consilience: The Journal of Sustainable Development*. 8(1): 115-127
- Oshewolo, S. (2010). Galloping Poverty in Nigeria: An Appraisal of the Government's Interventionist Policies. *Journal of Sustainable Development in Africa* 12(6): 264-274.
- Onuche, U. (2010). Impact of Poverty on The Sustainability of Forests in Nigeria: Implication for Sustainable Forests and Reduction in Global Warming. *Journal of Sustainable Development in Africa*. 12(6): 208-215
- Onwumere, J. F. and Alamba, C. S. (2012). Comparative Analyses of Modern and Traditional Bee Keeping Entrepreneurships in Abia State, Nigeria. *Journal of Economics and Sustainable Development*. 8(13): 1-9
- Onyekuru, A. N.; E. C. Okorji and N. S. Machebe (2010). Profitability Analysis of Honey Production in Nsukka Local Government Area of Enugu State, Nigeria. *Asian Journal of Experimental Biological Sciences*. 1 (1) 2010:166-169
- Pensoft Publishers, P. P. (2012). Bees, fruits and money: Decline of pollinators will have severe impact on nature and humankind. Retrieved on 03/10/2014 from ScienceDaily <http://www.sciencedaily.com/releases/2012/09/120904101128.htm>
- Rai, M. and Mauria, S. (2006). Handbook on Agriculture. Fifth Edition. Indian Council of Agricultural Research, New Delhi. 1346pp
- Sandford, M. T. (1998). European and U.S. Beekeeping Practice: Reflections on an Apicultural Sabbatical in France and Spain. http://apisenterprises.com/papers_htm/Meetings/french.htm, Accessed 07/11/2015
- Staffort, K. C. and Stoner, K. A. (2009). Honeybees and Beekeeping in Connecticut. A Publication of Connecticut Weekly Agricultural Report. April 1st. http://www.ct.gov/caes/lib/caes/documents/bee/honey_bees_and_beekeeping_in_connecticut.pdf. Accessed 09/11/2015
- Sunam, R. and Paudel, G. (2012). Democratising Nepal's Forest Sector Policy Process: The Role of Resistance by Community Federation. *Journal of Forest and Livelihood*. S10(1): 26-41
- The Daily Independent (2013). World Bank Report on Poverty in Nigeria. The Daily Independent of 22nd February.
- The World Bank (2013). Nigeria Economic Report, No. 1 May, 2013: 77684. 43pp
- The World Bank (2014). Nigeria Economic Report. Document of the World Bank, No. 2 July. 28pp. Retrieved on 14/11/2014 from http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2014/07/23/000470435_20140723133415/Rendered/PDF/896300WP0Niger0Box0385289B00PUBLIC0.pdf.
- Tom, E. G. (2010). Socio-economic and Cultural Aspects for Community Participation in Afforestation and Agroforestry Programmes: A Case Study of Teso District, Kenya. Retrieved from www.forestrynepal.org, 22/07/2015

Ukpong, I. G.; Ekpebu, I. D. and Ofem, N. I. (2013). Co-integration Inferences on Issues of Poverty and Population Growth in Nigeria. *Journal of Development and Agricultural Economics*. 5(7): 277-283.