

## DYNAMICS OF POVERTY, DEFORESTATION AND BEEKEEPING IN NORTHERN NIGERIA: CONCERNS FOR POLICYMAKERS – Part I

Muhammad Rabi'u JA'AFAR-FURO

Adamawa State University, PMB 25, Mubi, Nigeria, Email: muhammadfuro@gmail.com

*Corresponding author:* muhammadfuro@gmail.com

### Abstract

*The study examines the role of beekeeping amidst condition of abject poverty among the majority of the population in northern Nigeria, and the much popularised Afforestation Programmes of the public sector. Data were collected both from primary and secondary sources. The findings indicated that while the activities/livelihood of the people had devastating effects on the environment (felling of trees) of which massive adoption of low-technology beekeeping would play immense role in reviving the situation, the attitude of the government towards promoting tree planting campaign in the area has not been encouraging. Its concluded that the livelihoods of the poor majority of the people of northern Nigeria had devastating effects on the Afforestation efforts in the area, and beekeeping enterprise could be used as a bridge between the two (poverty and afforestation). It is therefore, strongly recommended that policymakers should address the dynamics between poverty, deforestation and beekeeping with the hope of stabilising the economic situation of the people of northern Nigeria and by extension improves their incomes and livelihoods.*

**Key words:** afforestation, beekeeping, dynamics, Northern, Nigeria

### INTRODUCTION

It was recently documented that the three poorest States in Nigeria are located in the north namely, Sokoto, Yobe and Adamawa in descending order, where the majority (74.0%) of the population live on less than US\$1 per day [1]. In addition, desertification proceeds at the rate of one kilometer of tillable land per year, with most people heavily relying on wood/felled trees as source of energy (for cooking) in a country that has been ranked the sixth in the world in terms of petroleum and gas production.

While several efforts of the Federal Government towards addressing these inadequacies through Programmes like Better Life for Rural Women (BLRW), National Poverty Eradication Programme (NAPEP), National Land Development Authority (NALDA) and Fadama Development Programme could not yield any desirable effects [2], the idea of promotion of tree planting and massive beekeeping have very much been relegated to the background. However, its widely documented in the literature that apart from serving as a reliable source of income to the rural farmers [3] through production and marketing of beehive

crops, bees potentially serve as good pollinators and also as conservators of biological biodiversity.

Statistically, it was documented [4] that globally, about 2.4 billion people burn biomass fuel on a daily basis to boil water and cook food. By implication, up to 2 million tonnes of biomass are being burnt every day, posing great threat to the areas where the demand for the population surpassed the forest resources. In China, further noted the report, forest plantations were rendered unproductive as a result of illegal felling of trees in the 1990s. Similarly, in Latin America and South-East Asia, alarming rates of deforestation are leading to land degradation and desertification. More worrisome is the case of the sub-Saharan Africa, where over three quarters of forests of many countries suffered depletion due to rampant utilization of forest resources for fuel.

In Nigeria, its reported [5] that about 262, 783 metric tonnes of fuel wood is being consumed annually, compared with 7, 210 tonnes for South Africa and 35, 313 tonnes for Thailand. While the trend had declined in these countries, Nigeria is still experiencing an upsurge in desertification. Failure to curb the development may result in its forests

converting to savannah grasslands and even desert. Some authors [6] associated this sharp development to hike in prices of petroleum products, availability of same and its affordability. According to a report [7], the utilization of wood as fuel has a direct link with the poverty status of the people of Nigeria. The authors sufficiently established that there is a high correlation (0.771) between level of poverty and wood consumption. This has been more pronounced in the northern parts of the country than in the southern or south eastern parts of the country. As majority (70.4%) of the people cannot afford other sources of fuel, the easiest way of meeting their domestic requirements is through the use of felled wood, thereby massively leading to depletion of the forests in the affected regions.

The fastest way to regain the vegetation cover of degraded land is through massive Afforestation. This is the process of planting trees with the intention of improving or regaining the degraded form of land. Various studies across Africa have shown that Afforestation had been used to improve vegetation cover and by extension the livelihoods of the communities in that area. For instance, a study adequately documented [8] the role of integrating biodiversity in the national Afforestation planning programme of Zimbabwe and, clearly stated the links between the factors and the resultant successes. Also, an international organisation [9] reported the contribution of forests and reforestation to the livelihoods and the national economy of Tanzania, highlighting the legal, policy, and regulatory framework for forest management in the country. Similarly, findings of group of researchers [10] sufficiently highlighted the usefulness of household tree planting to the communities of Tigray in northern Ethiopia, specifically taking into account the species, purposes, and the socio-economic determinants.

However, in Nigeria, although forest management system started in 1889 and Forest reservation was virtually completed in the high forest areas by 1940, presently, forest reserves are not maintained while management plans are either non-existent or

abandoned [11]. Efforts made by previous researchers [12] to assess land reclamation programmes through Afforestation indicated that although the previous Afforestation programmes in the country had positive effects on the environment and the livelihoods of the communities, there are no appropriate sustainability measures put in place for these Afforestation projects and shelterbelt programmes. It was established [13] that the consequences of these are more pronounced in the northern parts of the country where the diverse activities of the communities on forests, as a result of poverty level, remove the very much needed vegetation cover leading to desertification, soil erosion, and other land degradation features. The three tiers of governments (Federal, State & Local) in Nigeria are now committed towards Afforestation Programmes/Projects in an attempt to curb the sharp desertification and soil erosion in the northern Nigeria and gulley erosions in the southern parts of the country.

The role of beekeeping as a very strong link between the livelihoods of the poor majority of the people of northern Nigeria, and the Tree Planting Programme (TPP) as a very much publicised remedy of the government towards correcting this anomaly, is central to fast improvement of the economy of the region. Firstly, it has been widely documented [14; 15; 16] that keeping bees is a very profitable venture and by implication serves as source of viable income to the rural poor resource farmers through the sale of hive products (honey, beeswax, probolis, bee venom, royal jelly, bee pollen). Secondly, as honeybees depend totally on plants for food by making thousands of visits to flowers for collection of nectar and pollen grains, they pollinate these plants and by implication contribute immensely to the maintenance of ecosystems and agricultural production [17]. Therefore, the introduction of beekeeping into any Afforestation Programme/Project would not only improve the vegetation cover of the communities but also directly improve their livelihoods by serving as viable source of income as well as source of food and medication.

It is against this background that this study, *Dynamics of Poverty, deforestation and Beekeeping in northern Nigeria: Concerns for policymakers* was undertaken to specifically assess the state of poverty in northern Nigeria and its effect on vegetation cover, the role of beekeeping in promotion of biodiversity and the dynamics between these factors, and lessons for policymakers.

## MATERIALS AND METHODS

### The study area

The study covers northern Nigeria. The area is made up of 19 states (52.8%) of the 36 states including the Federal Capital Territory, Abuja. Majority (80.0%) of the people are predominantly farmers mostly using the traditional methods of farming. Major crops grown include sorghum, maize, rice, millet, groundnut, beans, and cotton, among others. Subsidiary economic activities like fishing, hunting, beekeeping, pottery, and blacksmithing are also embarked upon by a few people. The dominant tribes are Hausa, Fulani, Kanuri, Tiv, Nupe, Bwatiye, and Idoma. Others are Igala, Kilba, Gwari, Chamba, and Bura, just to mention a few.

### Sampling method and data collection

Data were collected mainly from secondary sources, and a few through applications of structured questionnaires which were supplemented with oral interviews to the beekeepers/farmers. As a representative of the northern area, the north-east zone was selected for data collection. A total of six States namely, Adamawa, Bauchi, Borno, Gombe, Taraba and Yobe made-up the area. Thirty beekeepers from each State were proposed for contact, making the total of 180. However, 120 were accessed for reasons of poor security situation in the parts of the country.

The secondary sources involved the published materials from reputable Journals, Theses, State documents and books of beekeeping.

### Data analyses

Data collected were subjected to statistical analyses, and some computations were effected in descriptive format to achieve the stated objectives.

## RESULTS AND DISCUSSIONS

### The state of poverty in northern Nigeria and its effects on vegetation cover

According to Nigeria Hand Book [18], Nigeria's population is put at 163 million people, with six defined zones namely North-East, North-Central, North-West, South-East, South-South and South-West, and a total area of 923, 768 square kilometers. The country is regarded as the most populous nation in Africa.

The information in Table 1 indicates the population of Nigeria and poverty incidence since 1980. It shows that there has been a steady trend of increase in the percentage of people who have been below the poverty line since the year under consideration.

Table 1. Population and incidence of poverty from 1980-2010 in Nigeria

Year	Estimated population (million)	Population in poverty (million)	Percentage of poverty incidence (%)
1980	65.0	17.1	27.2
1985	75.0	34.7	46.3
1992	91.5	39.2	42.7
1996	102.3	67.1	65.6
2004	126.3	68.7	54.4
2010	163.0	112.5	69.0

Source: NBS (2010)

For example, while the population of Nigeria was put at 65 million people in 1980, about 27.2% of this figure was poor. In other words, about 17.1 million people could not afford the basic necessities of life like shelter, food, education, required clothing and access to basic health facilities. The years 1985, 1992, 1996, 2004 and 2010, with population of 75, 91.5, 102.3, 126.3 and 163 million accounted for 46.3%, 42.7%, 65.6%, 54.4% and 69.0% of individuals, respectively, that were living in poverty in the country. For any responsive government of any nation, the rate has been absolutely alarming.

In an attempt to assess the level of poverty by zones in the country, the National Bureau of Statistics' [19] Nigeria Poverty Profile (NPP) was taken for reference. The document classified poverty using four different poverty measures. These were Relative Measure,

Absolute (Objective) Measure of Poverty, Dollar per Day, and Subjective Poverty Measure (see appendix 1). The findings in Table 2 show that by all standards mentioned therein the northern zones (north-east, north-central & north-west) of the country ranked the highest.

Table 2. Zonal incidence of poverty by four measures in Nigeria

Zone	Food Poor (%)	Absolute Poor (%)	Relative Poor (%)	Dollar Per day (%)
North – central	38.6	59.5	67.5	59.7
North – east	51.5	69.0	76.3	69.1
North – west	51.8	70.0	77.7	70.4
South – east	41.0	58.7	67.0	59.2
South – south	35.5	55.9	63.8	56.1
South – west	25.4	49.8	59.1	50.1

Source: NBS (2012)

For instance, while up to 51.8% were found to be food poor in northern Nigeria, the highest recorded for the southern part was 41.0%. Similarly, while as much as 70.0% were found to be in absolute poverty in part of the north, the southern counterparts recorded 58.7% as the highest.

The condition of relative poverty reached 77.7% for the people of the north against 67.0% for the people of the south.

The dollar per day measure which is more conventional in application accounted for up to 70.4% for parts of northern Nigeria against 59.2% for the southern parts. These findings are shown in Table 2.

In order to determine the effect of poverty on utilisation of forest resources as wood fuel, information applied by a group of authors [20] were found relevant.

These are presented in Table 3.

It could be observed that the poverty rate had a very positive correlation with the consumption of forest resources as fuel.

This was more pronounced in the northern parts of Nigeria (north-east, north-central & north-west) than the southern counterparts (south-east, south-south & south-west).

Table 3. Poverty rate and percentage of utilisation of wood as source of fuel by zone in Nigeria

Zone	Poverty rate	Percentage of wood as fuel source
North –east	72.2	95.9
North –west	71.2	95.3
North – central	67.2	86.4
South –west	43.0	54.9
South –east	26.7	78.0
South – south	35.1	72.7

Source: NBS (2007) [37]

The implication of the above finding is that as the trend of poverty increases so will be the utilisation of wood as fuel. This would definitely lead to extreme removal of vegetation cover in the northern parts of the country resulting in unbalanced ecosystems. However, this can be improved through massive Afforestation/tree planting exercise in the region, and also by improving the livelihoods of the people especially by introducing the use of kerosene and/or gas as sources of fuel for domestic purposes.

#### **The role of beekeeping in the promotion of biodiversity**

The immense role beekeeping plays in pollination of crops and other plants in the ecosystem thereby enhancing biological diversity, and by extension promoting the conservation of the environment has been advanced by several authors. For example, a scholar [21] noted that honeybee workers make thousands of visits to flowers in order to collect nectar and pollen, and by doing so help in improving fruit and seed-setting both in the wild and in cultivated plants. In a similar fashion, another two researchers [22] estimated the value of increased yield and quality of crops as a result of pollination by honeybees in the United States of America (USA), for the year 2000, at US\$14.6. However, in Nigeria, this very important service of the honeybees has not been established let alone quantifying the benefits, except for pockets of attempts made by very few authors [23; 24]

By the above explanation, it could be inferred that honeybees can be used to improve the diverse species of wild plants which will lead to the development of forest, and also enhance agricultural production. Therefore, the

improvement of forests and vegetation cover will among other things, call for establishment of apiaries by private individuals and governments alongside Afforestation projects in the country and northern zones in particular. In other words, improved methods of beekeeping should be incorporated in any Afforestation programmes/projects of the public and private sectors. Considering the level of literacy in the country where about 80.0% of the population reside in rural areas, and as noted by an international organisations [25], about 60.82% of adults above 15 years were illiterates, adopting a simple technology for advancing the course of beekeeping for Afforestation programmes becomes necessary. In this regards, the utilisation of Kenya Top bar beehive becomes handy.

#### **The dynamics of poverty, Afforestation, and beekeeping in northern Nigeria**

Presently, Nigeria has eight established National Parks that are well endowed with diverse flora and fauna resources, some of which are endemic to the country [26]. These parks are Cross River, Gashaka-Gumti, Kamuku and Kainji Lake. Others are Okomu, Old Oyo, Lake Chad Basin and Yankari. These forests of Nigeria contribute immensely to the national Gross Domestic Product (GDP) and sustenance of the livelihoods of the people. What led to the earlier slow development of the forestry sector in Nigeria, noted some organisations [26] was perhaps the perception by policymakers that it contributed less to the economy of the country. However, this later changed due to the structured campaign of awareness targeted at policymakers through their membership at various National Forestry Action Programme (NFAP) committees.

The information in Table 4 indicates the earlier efforts made by the Forestry Management Evaluation and Coordinating Unit (FORMECU) towards estimating the resources to be expended over a 5-year period for sustainable forestry development in Nigeria by various sectors namely, Federal, State, and Local Governments. Others are community, private, and donor organisations. For the four programmes indicated, donor organisations accounted for the larger

proportion (47.80%) with US\$46.8m. This is followed by the Federal Government and Private Sector with 24.11% (US\$23.6m) and 11.75% (US\$11.5m), respectively. While the State Government accounted for 8.38% (US\$8.2m), the community was to contribute 4.95% equivalent of US\$4.85m. Incidentally, the Local Government Area that is closer to the people that have direct interaction with the forest resources would expend a sum of US\$2.95m representing a meager 3.01%. In all, a total sum of US\$97.9m was to be spent over the period under consideration.

Given the above scenario, it could be stated that the level of commitment by the public sector in the sustainable development of forestry industry in Nigeria has been very minimal taking into cognisance of the role forest resources play in the lives of the people of the country, especially the northern parts.

Table 4. Estimated investment requirement for development in Nigeria (US\$ million)

Prog	Donor	Fed	State	LG	Com	Pri	TL
FMP	23.5	8.8	4.9	1.35	3.3	3.3	43.2
SFP	14.3	8.05	2.5	0.75	3.5	3.0	32.1
FIDP	2.0	2.3	0.8	0.5	-	5.2	10.8
ISP	7.0	4.45	-	0.35	-	-	11.8
<b>Total (TL)</b>	<b>46.8</b> 47.8%	<b>23.6</b> 24.11%	<b>8.2</b> 8.38%	<b>2.95</b> 3.01%	<b>4.85</b> 4.95%	<b>11.5</b> 11.3%	<b>97.9</b> 100%

Note: Prog. = programme; Fed = federal; LG = local govt.; Com = community; Pri = private; FMP = forest management programme; SFP = social forestry programme; FIDP = forestry industry development programme; ISP = institutional strengthening programme.

Source: FORMECU (1996) in EC/FAO (2003)

While the immense central role beekeeping plays in the economies of both advanced and developing nations where the knowledge and the services of the industry have been properly assessed, documented, and promoted abound in the literature around the globe, the methods of the farming is still largely traditional in Nigeria. Apart from few attempts made by some researchers [27; 28; 3 29] in assessing the viability of beekeeping in alleviation of poverty among citizens of the country, very little or no efforts have been put in place by the public and private sectors towards this direction.

As beekeeping has been confirmed to surpass crop production in terms of income generation for farmers [3; 14; 28], generates raw materials for industries [30; 31; 32], promotes Afforestation and by extension biodiversity,

noted two imminent researchers [33; 17], and earns foreign exchange for countries that export the hive crops (34; 28\), then certainly the beekeeping industry can play a vital role in the livelihoods and economies of both rural and urban communities. Since among the various farming options available to man, beekeeping is the simplest, most affordable and capable of being undertaken by the most poor resource farmers [35], then adopting the enterprise by policymakers as a bridging instrument between balancing the environment through Afforestation and livelihoods of the communities becomes imperative.

A report by the News Agency of Nigeria [36] indicated that the Federal Government of Nigeria (FGN) has now resuscitated the Council for Shelterbelt and Afforestation (CSA) with the mandate of ensuring that all issues regarding ecological problems are rapidly resolved in the country. Specifically, it is charged with halting the southward movement of the Sahara Desert and mitigating its effect on the integrity of the environment. Although the CSA was initially set-up in 2004, the establishment of a similar outfit, the Great Green Wall (GGW) initiatives, in 2005 led to its dormancy. The latter was saddled with the responsibility of establishing regional Afforestation projects that span about 1500 km from the east to west and two-km wide from north to south using both economic and non-economic tree species to be based on community-driven and integrated rural approach.

These are all laudable projects that would definitely restore the degraded land and vegetation cover if implemented properly. But thorough awareness campaigns for rural community members and absolute commitment on the part of the policymakers are necessary requirements for the success of the programmes. In this regard, integrating a rural-based community enterprise into the programmes like beekeeping would further strengthen the income of the people, and enhance Afforestation, thereby reducing the scourge of desertification.

### The status of beekeeping in Northern Nigeria

Information in Table 5 shows the general status of beekeeping in northern Nigeria.

Table 5. The status of apiculture/beekeeping in North-East Nigeria

State	No. to be interviewed	No. interviewed (No. / %)	Type of beehive in use	Frequently/percentage of beehives (No. / %)
Adamawa	30	25 (20.83)	Log	132 (47.83)
Bauchi	30	20 (16.67)	Woven straw	55 (19.93)
Borno	30	15 (12.50)	Earthen pot	27 (9.78)
Gombe	30	22 (18.33)	Pit	09 (3.26)
Taraba	30	27 (22.50)	Gourd	46 (16.66)
Yobe	30	11 (9.17)	Plastic bowl	07 (2.54)
<b>Total</b>	<b>180</b>	<b>120 (100)</b>		<b>276 (100)</b>

Note: Values in parentheses are percentage of the total  
 Source: Computed from field data (2013)

The apiculture practice or beekeeping in northern Nigeria and particularly the north-east has been described by several authors [28; 35; 29]. This is basically determined by the types of beehives in use in a locality, be it improved or native. All these scholars documented that beekeeping in the northern parts of Nigeria is largely traditional. In other words, most beehives in use have been the native (Log, Pot, Woven straw, etc.).

The findings in Table 5 revealed that almost a decade or more from the time of these authors' reports, the situation has not significantly changed.

It could be observed from the Table 5 above that although a total number of 180 beekeepers were scheduled for interview, only 120 were accessed. This was not unconnected with the poor security situation experienced in the north-eastern parts of the country, with Borno and Yobe States as most hit. The Table (5) also shows that, of all the beehives in use by the beekeepers/apiarists, majority (97.46%) were native-make otherwise known as traditional, with Log beehives accounting for the larger proportion (47.83%). Woven straw, gourd, earthen pot and the use of pit recorded 19.93%, 16.66%, 9.78% and 3.26%, respectively.

Plastic bowl which is neither traditional nor improved, but an improvised material, accounted for only 2.54%.

With the types of beehives still in use in the study area, it could be stated with some

significant level of perfection that beekeeping is largely traditional in the northern parts of the country.

Given the above situation and if beekeeping should maximally be of benefit to the people and afforestation projects or programmes of the government, the methods must be improved. In this regard, a low-technology beekeeping in the form of Kenya top-bar beehive is recommended for its simplicity.

## CONCLUSIONS

Based on the findings of this study, it could be stated that the livelihoods of the poor majority of the people of northern Nigeria had devastating effects on the Afforestation efforts in the area, and beekeeping enterprise could be used as a bridge between the two (poverty and Afforestation) factors. Also, all the three tiers of governments (Federal, State and Local) in the country in the past had not invested adequate resources towards the development of the forestry sector. Similarly, both the private and public sectors had not recognized the role of beekeeping industry in improving the livelihoods of the poor resource people as well as enhancing Afforestation programmes.

It is therefore, strongly recommended that policymakers should address the dynamics between poverty, Afforestation and beekeeping with the hope of stabilising the economic situation of the people of northern Nigeria and by extension improves their incomes and livelihoods. Specifically, both the private and public sectors should intensify efforts in the allocation and expenditure of adequate resources rationally towards the development of Afforestation programmes, and beekeeping enterprise should be integrated in these programmes as a bridging force.

## ACKNOWLEDGMENTS

I sincerely thank the management of the Adamawa State University, Mubi, Nigeria, for allowing me time to conduct this study, and Professor W. B. Ndahi, Drs. P. V. Kwaghe and B. H. Gabdo, of the Faculty of

Agriculture of the University, for their valuable advice.

## REFERENCES

- [1]Ayodele, I. A., Onyekuru, J. E., 1999, Essentials of Beekeeping. Sam Bookman Publishers. 45pp
- [2]Babanyara, Y. Y., Saleh, U. F., 2010, Urbanisation and the Choice of Fuel Wood as a Source of Energy in Nigeria. *Journal of Human Ecology*. 31(1): 19-26
- [3]Dalang, M., 2001, Apiculture and Poverty Alleviation. Plateau Agricultural Development Programme, PADP, Newsletter 4 (5): 6 -9
- [4] Dashe, N. V., 2006, Economics of Beekeeping and Use of Bee Products. Papers Presented at a Beekeeping Training Workshop Organised for Farmers by SMJ Ventures, Jos Plateau State. Held at Ministry for Women Affairs, Yola, Nigeria. 14<sup>th</sup>-15<sup>th</sup> December
- [5]Dukku, U. H., 2001, The Role of beekeeping in Poverty Alleviation and Environmental Protection. Paper Presented at the Monthly Technology Review Meeting (MTRM). Held at MTRM Hall, Bauchi State Agricultural Development (BSADP) Headquarters. 28<sup>th</sup> February. 4pp
- [6]Dukku, U. H., 2013, Identification of plants visited by the honeybee, *Apis mellifera* L. in the Sudan Savanna zone of northeastern Nigeria. *African Journal of Plant Science*. 7(7): 273-284
- [7]Eluagu, L. S., Nwali, L. N., 1999, An Economic Appraisal of an Improved Method of Beekeeping in Nigeria: A Case Study of Apiculture Unit, Federal College of Agriculture, Umudike. *Nigerian Agricultural Journal*. 30: 99-144
- [8]European Commission/Food and Agriculture Organisations, EC/FAO, 2003, Experience of Implementing National Forest Programmes in Nigeria. EC-FAO Partnership Programme. EC Tropical Forestry Budget Line Project B7 6201/98-08/VIII/FOR Project GCP/RAF/354/EC. Pp74
- [9]Farinde, A.J., Soyeb, K.O., Oyedokun, M.O., 2005, Exploration of Beekeeping as a Copping Strategy in a Deregulated Economy. *Journal of Agricultural Extension*.8:76-83.
- [10]Gebreegziabher, Z.; Mekonnen, A.; Kassie, M. and Kohlin, G., 2010, Household Tree Planting in Tigray, Northern Ethiopia: Tree Species, Purposes, and Determinants. *Environment for Development, Discussion Paper Series-EfD DP 10-01*. Pp26
- [11]Ja'afar-Furo, M. R., Sulaiman, A., Hong, E. S., 2006, A Comparative Analysis of Beekeeping and Crop Production in Adamawa State, Nigeria. *Apiacta*. 41: 44-53
- [12]Ja'afar-Furo, M. R., 2007, Appraising the perception of farming communities towards adoption of apiculture as a viable source of income in Adamawa State, Nigeria. *The Apiacta*. 42: 1-15
- [13]Ja'afar-Furo, M. R., 2007, Economic Effects of Bee Pollination on Maize Yield in Furo, Fufore Local Government Area, Adamawa State, Nigeria. *Global Journal of Agricultural Sciences*. 6(2): 149-152

[14] Lemessa, D., 2007, Beekeeping: A Livelihood Strategy in Pastoral and Agro-Pastoral Dry Land Areas of Southern Oromia (Liban District) and Somali Regional States (Filtu and Dollo Ado Districts).

[15] Medugu, N. I., Majid, M. R., Johar, F., Choji, I. D., 2010, The role of afforestation programme in combating desertification in Nigeria. *International Journal of Climate Change Strategies and Management*. 2(1): 35 – 47

[16] Morse, R., Calderone, N., 2000, The value of honeybees as pollinators of US crops in 2000. *Bee Culture*. 1-15.

[17] National Bureau of Statistics, NBS, 2007, Annual Abstract of Statistics. National Bureau of Statistics, Abuja, Nigeria.

[18] National Bureau of Statistics, NBS, 2010, The Nigeria Poverty Profile 2010. National Bureau of Statistics, Abuja, Nigeria. 30pp

[19] National Bureau for Statistics, NBS, 2012, Nigerian Poverty Profile 2012.

[20] News Agency of Nigeria, NAN, 2013, Nigeria Inaugurates Council on Shelterbelt and Afforestation. Retrieved from - <http://premiumtimesng.com>, on 21/09/2013

[21] Nigeria Hand Book, NHB, 2010, The Nigeria Hand Book, 14<sup>th</sup> Edition.

[22] Ojeleye, B., 1999, Foundation of Beekeeping in the Tropics. Published by CEBRAD Press, Ibadan, Nigeria. 225pp

[23] Olagunju, D., 2000, Alleviating Poverty through Beekeeping. Charli-Tonia Publishers, Osogbo, Nigeria. 190pp

[24] Olusegun, K. N., 2009, Threats to Nigerian Environment: A Call for Positive Action. Paper Presented at the 7<sup>th</sup> Chief S. L. Edu Memorial Lecture held at Ondo Town Hall. 13<sup>th</sup> August.

[25] Saliu, O. J., Alao, J. S., Oluwagbemi, T., 2010, An Evaluation of Farmers' Participation in Afforestation Programme in Kogi State, Nigeria. *Journal of Agricultural Science*. 2(3): 248-257

[26] Shumba, E. M., 2001, Biodiversity and Planning Support Programme: Zimbabwe Case Study. Paper Prepared for an International Workshop on Integration in National Forestry Planning programme. Held in CIFOR Headquarters, Bogor, Indonesia. August 13<sup>th</sup>-16<sup>th</sup>

[27] Ugoh, S. C. and Ukpere, W. I., 2009, Appraising the Trend of Policy on Poverty Alleviation Programmes in Nigeria with Emphasis on a National Poverty Eradication Programme (NAPEP). *African Journal of Business and Management*. 3(12): 847-854

[28] Winrock International (2006). The Contribution of Forests to local Livelihoods and the Tanzanian National Economy: A Summary of Case Study. Pp24

[29] World Bank (2011). Literacy Rates in Nigeria. [www.admiralmarkets.com.ng](http://www.admiralmarkets.com.ng). Accessed 15/09/2013

[30] World Health Organisations, WHO, 2006, Fuel for Life: Household Energy and Health- stripping our forests, heating our planet. P22

[31] Zaku, S. G., Kabir, A., Tukur, A. A., Jimento, I. G., 2013, Wood Fuel Consumption in Nigeria and the Energy Ladder: A Review of Fuel Wood Use in

Kaduna State. *Journal of Petroleum Technology and Alternatives Fuels*. 4(5): 85-89

#### Appendix 1:

The NBS (2012) classified poverty into the following:

i) Food Poverty line is N39, 759.49. This Food Poverty is an aspect of Absolute Poverty Measure which considers only food expenditure for the affected Households.

ii) Absolute Poverty line is N54, 401.16. This is the second step in Absolute (Objective) Poverty measure. Here, this method considers both food expenditure and non- food expenditure using the per capita expenditure approach.

(iii) The Relative Poverty line is N66, 802.20. This line separates the poor from the non-poor. All persons whose per capita expenditure is less than the above are considered to be poor while those above the stated amount are considered to be non-poor.

iv) The Dollar Per day Poverty line is N54, 750. This measures, consider all individuals whose expenditure per day is less than a dollar per day using the exchange rate of Naira to Dollar in 2009/2010.

v) The Subjective Poverty Measure is the perception of the citizenry. It is neither related to Per Capita Expenditure of household nor the Country adult – equivalent scale. From the survey result, the core poor is 46.7 percent, Moderate poor is 47.2 percent while the non-poor is 6.1 percent

vi) Another critical measure of poverty is the Gini Coefficient (Inequality Measurement). This measure can explain the spread of Income or expenditure yet cannot explain increase or decrease of individuals or persons in poverty. In 2004, the Gini Coefficient was 0.4296 whereas in 2010 it was 0.4470 indicating that inequality increased by 4.1 percent nationally.