

Full Length Research Paper

Human activities, pressure and its threat on forest reserves in Yewa division of Ogun State, Nigeria

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This study evaluates the degree of pressure and threats from human activities on protected areas in Yewa Division of Ogun State, Nigeria. Four forest reserves (F.R.) in the division were randomly selected as representative samples, namely Ilaro F.R, Imeko F.R, Oja odan F.R. and Aworo F.R. Primary data were collected through the use of Rapid Assessment and Prioritization of Protected Areas Management (RAPPAM) designed questionnaire, recommended for evaluation of management effectiveness of protected areas (WWF, 2003). Findings revealed all reserves were severely threatened by logging while only Oja- Odan F.R. was severely threatened by conversion of land use. Furthermore, all the reserves are highly threatened by grazing except Ilaro F.R. while cross boundary influence severely threatened Oja-Odan F.R. Results showed no significant difference (LSD = 9.04; $p < 0.05$) between activities in each forest reserves although analysis of variance shows a significant difference between the pressure and threat across the forest reserves.

KEYWORDS: Land use, Rural-Urban Migration, Conversion of Land Use, Forest reserves, Land degradation.

INTRODUCTION

Many developing countries, like Nigeria, are suffering from serious environmental degradation primarily because of the rapid growth in population which has not only brought about gross encroachment and damage to natural forest, wildlife, land, water and even air but has also brought unacceptable quality of life conditions in the human community environment (Harvey, 1998).

Thousands of years of cutting and burning, especially in Africa, have so transformed the vegetation that it bears little resemblance to its original forest state in which tree cover was probably denser than it is today (Husain, 1989). Concern is rising about the rapid rate of tropical deforestation, which is the temporary or permanent clearance of forest, for agriculture and other purposes. The main cause of deforestation in tropical forests is clearing for agriculture to feed the growing population or (to a lesser degree) to earn foreign exchange from export of cash crops (Husain, 1989).

Every year about 6.1 million hectares of tropical moist forests are destroyed (Husain, 1989). If the present rate of deforestation of 6.1 million hectares per year were to

continue indefinitely, the tropical moist forests would be completely cleared in 170 years (Omiyale, 2001). Cote d'ivoire and Nigeria annually lose about 5.2 per cent of their forests, while in Costa Rica, Sri Lanka and El Salvador the rates are 3.6 per cent, 3.5 per cent and 3.2 percent respectively (Omiyale, 2001). Out of the total land area of 923.768 km² in Nigeria, forests account for only 9.61%; 48.53% grassland; 1.05% fresh and inland wetlands; 0.3% tree crop plantations and 20.33% farmlands (Omiyale, 2001). Within the past 20 years, an estimated 43.48% of the total forest ecosystem has been lost through human activities (Omiyale, 2001). Between 1980 and 1990, according to Omiyale (2001), the annual rate of deforestation averaged 3.5 % and the forest area declined from 14.9 million to 10.1 million hectares. This leads to the loss of not only the wood and non wood forest products but also its vital functions in moderating local climate, controlling water and wind erosion and its insurance of a continuous flow of clean water in rivers and streams (Nwoboshi, 1989). Omiyale (2001) further stressed that this has led to soil degradation, water contamination, and microclimate change, drying up of rivers and lakes and the depletion of wildlife. For now, barely 5.34 % of the total land area of Nigerian is under forest as against the international requirement that 25 %

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of the total land area of each country should be under forest (Popoola and Akande, 2001).

Since prehistoric times, forest serves various purposes and will continue to do so as long as life continues on this planet (Abbiw, 1989). The forest houses and protects game, stabilizes the environment, prevents soil erosion and serves as a source of medicinal plants for curing diseases. Forests also provide the greatest diversity of plant life, yet they continue to be felled and burned and seldom replaced. The importance of forest and forestry in the development of our national economy has been widely reported in literature (e.g. Adeyoju, 1975, 2001 and Akindele 2001). In many parts of Nigeria, the forestry sector contributes significantly to the internally generated revenue (IGR) of the state (Akindele, 2001). Between 1996 and 2001, this sector generated N608,460,455.78 from the sales of timber alone (Ajayi, 2001).

However, the resources inside the natural forest as well as those in the various plantation sites have been battered by de-reservation for tree crop plantations or large scale illegal farming operations, all of which the state forestry authorities have been unable to curtail or manage (Adeyoju, 2001).

The Ogun state forestry department as of 1999 estimated that 23 % or 699.2 km² of the forest reserves had been encroached although a government committee estimated it at 69 % (Adetula, 2001). The implication is that the forest reserve is disappearing rapidly since the operations of the encroachers involved the conversion of the forest reserves into farmland through brushing, felling, burning and packing of the vegetation before planting their crops which eventually turn the area into a treeless land or in some cases into a barren land. In fact, encroachment into protected areas can be linked to the killing of the goose that is laying the golden egg (Adetula, 2001). According to Adetula (2001), the rate at which the forest reserves is being destroyed by the encroachers is alarming; young and premature economic and economic trees are being destroyed on daily basis. If the rate is not curtailed, this will definitely lead to total destruction of the high forest in the state in the next five years (Adetula, 2001). Adeyoju (2001) pointed out that the resources inside and outside forest estates in Ogun state have been battered by de-reservation for tree crop plantations and large scale illegal farming operation all of which the state forestry authorities have been unable to curtail or manage. Also, Adetula (2001) stressed that encroachment is a very serious problem in the state and has grown to an alarming and embarrassing position. Society is continuing to invest resources into acquiring and managing protected areas, believing that they are the backbone of biodiversity conservation and that they deliver a range of other social, economic and environmental benefits. Since over 12 % of the earth's terrestrial surface is now in nationally designated protected areas (UNEP-WCMC, 2008) but global biodiversity continues to decline at an alarming rate (Butc

hart et al., 2010). There is a need to evaluate the extent to which these reserves really do protect their values and deliver benefits to the community (Hockings and Phillips, 1999; Ervin 2003a; Southworth et al., 2006; Timko and Innes, 2009). Hence the need to evaluate level of encroachment and threat on our protected areas using internationally accepted tools for the purpose of comparison, record and emphasis. This study evaluates the degree of human activities on protected areas in Yewa Division of Ogun State, Nigeria.

Definition of Terms

The word "Pressure" used in this study describes if there have not been a pressure in the last 5 years on the protected area due to the activity in question, according to WWF (2003), while "threat" describes if there will or will not be threat on the protected area in the next 5 years due to the activity in question based on the respondent's view.

SURVEY METHOD

Study Area

Yewa is one of the four ethnic/geo-political division in Ogun State of Nigeria. The other three divisions are Egba, Ijebu and Remo. Yewa comprises of five local government areas namely; Yewa north, Yewa south, Ipokia, Imeko-afon and Ado odo ota (Figure 1). The people of Yewa are popularly called Egbados. Though predominantly occupied by Yoruba ethnic group, Odeda Local Government is generally inhabited by people from all sub – ethnic group in Nigeria and neighboring West African States and endowed with physical and human resources. The annual rainfall, which normally spreads over eight (8) months between April and November, ranges between 100mm to 200mm, having bi – modal pattern with the peaks at May /June and September / October, (Oluwalana, 1997). The relative humidity is high all the year and generally above 80% during the wet season and ranges between 60 % and 8 0% during the dry season. The average maximum daily temperature varies from 280 C in the rainy season to 320 C in the dry season.

The study area is inhabited with people of diverse occupational demography such as agriculture, Trading, Dyeing and Tyeing, Pottery, Hunting, Fishing, Driving, Teaching and Civil Services, etc.

METHODOLOGY

Four forest reserves out of seven in the division were randomly selected as representative samples. They are:

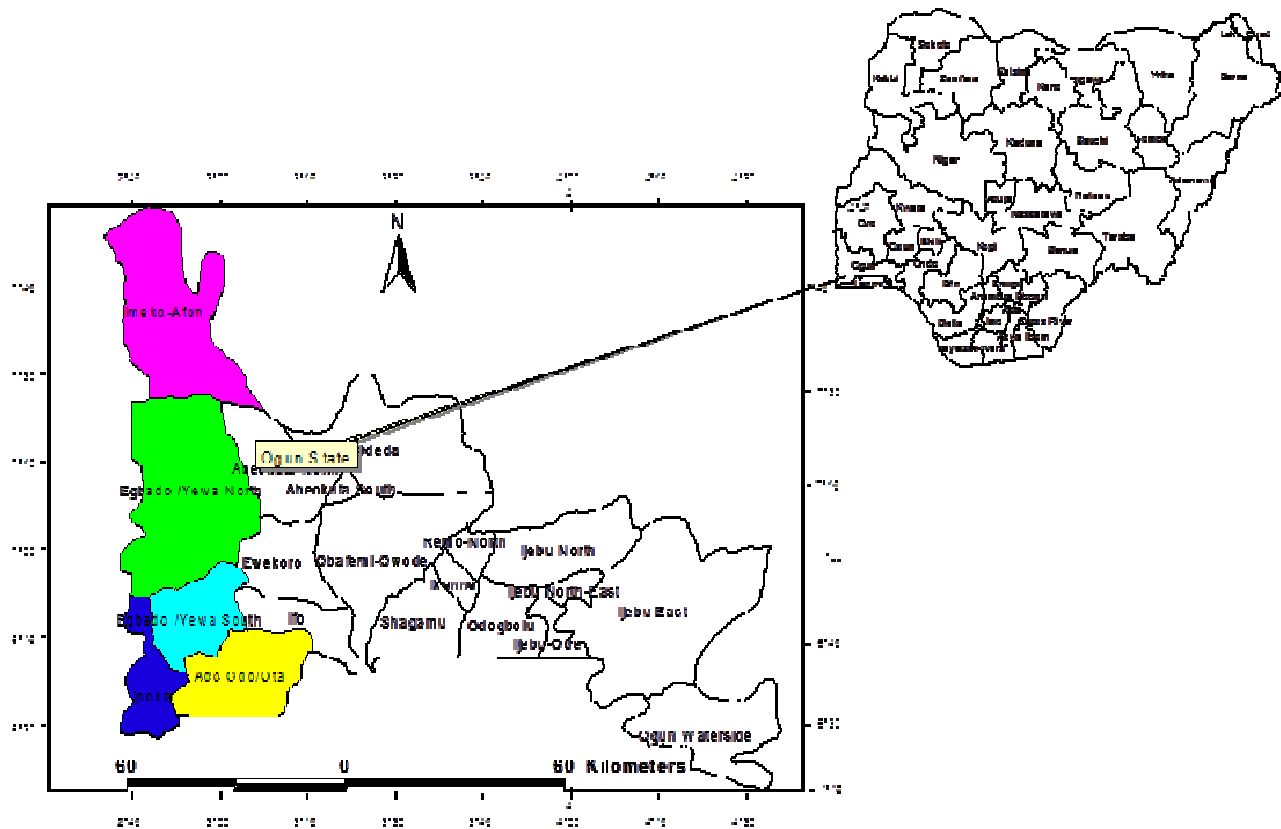


Figure 1: Map of Ogun State Highlighting the Five Local Government of Yewa Division

Ilaro forest reserve, Imeko forest reserve, Oja odan forest reserve and Aworo forest reserve.

Primary data were used for this study. Data were collected through the use of the Rapid Assessment and Prioritization of Protected Areas Management (RAPPAM) designed questionnaire that was recommended for evaluation of threats and pressure on protected areas (WWF, 2003).

Information on threats to the protected areas was collected from two field officers (i.e. two long serving rangers) of each forest reserve, a research scientist on the field and a local dweller of a bordering community to the reserve (Kiringe-Okello, 2007).

The protected area officers who were interviewed through the questionnaire were considered knowledgeable in light of their involvement in protected area management over time. The primary four protected area officers were asked, independent of each other, to rank from one (lowest threat level) to five (highest threat level) the key six activities that serve as threats to protected areas identified from an initial preliminary survey by Nchor, 2011. The activities are; Logging, Conversion of Land Use (CLU), Hunting, Non Timber Forest Product (NTFP) harvest, Grazing and Cross Boundary Influences (CBI). Each protected area officer was only allowed to provide ranks for the threat factors

on the protected area under which they served.

DATA ANALYSIS

Descriptive statistics and ANOVA were the statistical tools used for data analysis in this study.

Nominal values (Likert scale, ranging from 1 to 4) were assigned to Extent, Impact and Permanence of environmental activities in Ilaro, Aworo, Oja-Odan and Imeko forest reserves as recommended by WWF (2003).

1 is allocated for Localized Impact/Extent i.e. up to 5% of the forest reserve is affected.

2 is allocated for Scattered Impact/Extent at 5-15%

3 is allocated for Widespread Impact/Extent at 15-50%

4 is allocated for Throughout Impact/Extent at >50%

However, for permanence:

Short term allocated 1 which is at <5 years

Medium term allocated 2 which is at 5-20 years

Long term allocated 3 which is at 20-100 years

Permanent allocated 4 which is at >100 years

Degrees of pressure and threat were generated by multiplication of extent, Impact and permanence in each end use (activities) as recommended by WWF (2003).

Interpretation of Values for Degree:

1-3 is regarded mild

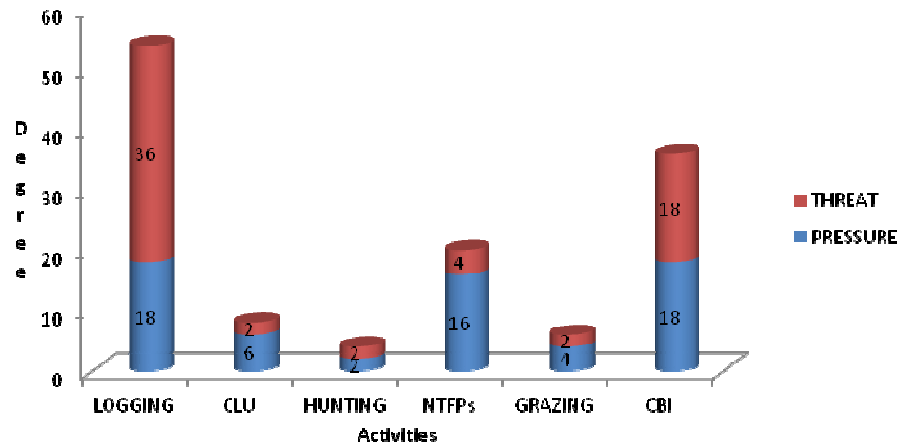


Figure 2: Comparison of Degree of Pressure and Threat on Ilaro Forest Reserve

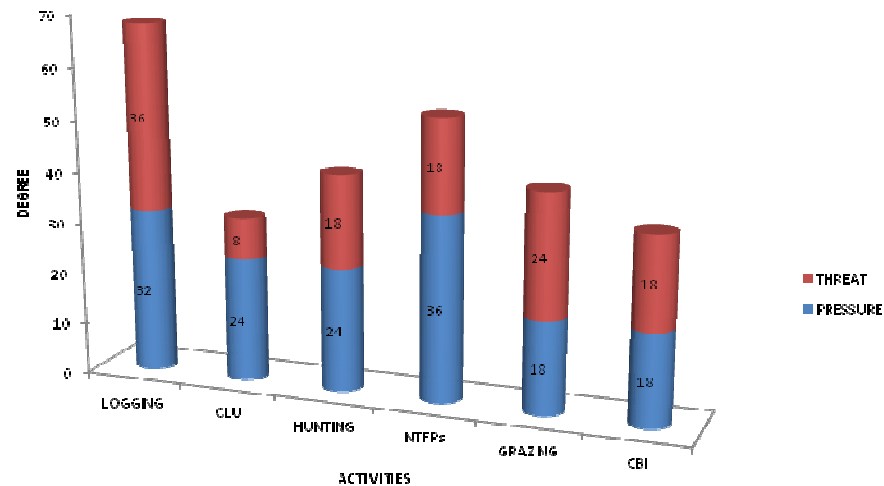


Figure 3: Comparison of Degree of pressure and threat on Aworo Forest Reserve

4-9 is moderate
 12-24 is high, and
 21-64 is severe.

RESULTS AND DISCUSSION

The findings show (Figure 2; Appendix 1 and 2) that there is a high degree of pressure on Ilaro Forest reserve from Logging, NTFP and Cross boundary influences with an indication of 180, 160 and 180 respectively. Also, the degree of threat on logging (360) and CBI (180) is severe and high respectively. Degree of pressure from hunting and grazing were indicated mild by 20 in each case. Information from the respondents revealed that hunters scarcely get wild animals to harvest in the reserve, hence

the mild pressure and threat. Clashes between Fulani Nomads and indigenous farmers in recent times were part of the explanations recorded for mild pressure from grazers that intruded into the reserve. However, result shows there is possibility for increment with indication of 40 recorded for threat from grazing in Ilaro Forest reserve.

In Aworo Forest Reserve, degree of pressure from logging and harvesting of NTFP were severe at 320 and 360 respectively. The finding also revealed that there is a high degree of pressure on the reserve from Conversion of land use (240), Hunting (240), Grazing (180) and Cross boundary influence (180). Results of threats on Aworo Forest reserve show that logging will be severe (360), while Grazing, Hunting, CBI and NTFP harvest will be high at 240, 180, 180 and 180 respectively (Figure 3

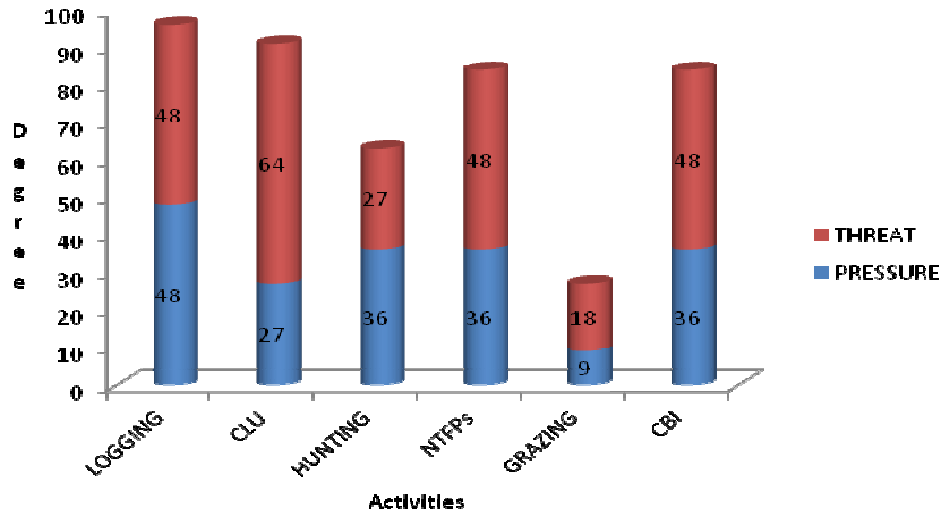


Figure 4: Comparison of Degree of Pressure and Threat on Oja-Odan Forest Reserve

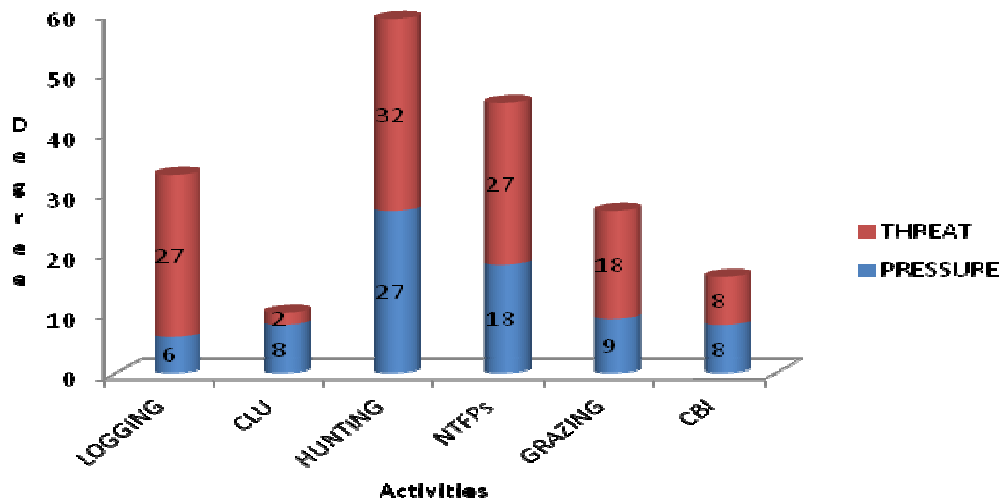


Figure 5: Comparison of Degree of Pressure and Threat on Imeko Forest Reserve

and Appendix 1). Responses on the projection of respondents revealed that recent effort and enforcement put in place by the management of the reserve in evacuating all illegal occupant of forest land will help check high degree of land use conversion in the area, hence the moderate (80) threat for CLU.

Findings in Oja Odan Forest Reserve show (Figure 4; Appendix 1 and 2) that there is severe pressure on the reserve from all activities except grazing, which was indicated moderate at 90. Also, the degree of threat on all activities is severe for all activities except grazing which was high at 180. A result describes Oja-Odan Forest

reserve as the most negatively influenced/affected by human activities, other than grazing. Respondents also explained that grazing activities on the reserve has been minimized in the last five years due to various clashes that occurred between farmers and mobile pastoralists. However, in Imeko Forest Reserve, degree of pressure from harvesting of NTFP is high at 180 while hunting is severe at 270 (Figure 5 and Appendix 1). Pressure from other activities was moderate at 60, 80, 90, 80 for Logging, CLU, Grazing and CBI respectively. The finding also revealed that there is severe degree of threat on the reserve from logging (270), Hunting (320), and NTFP

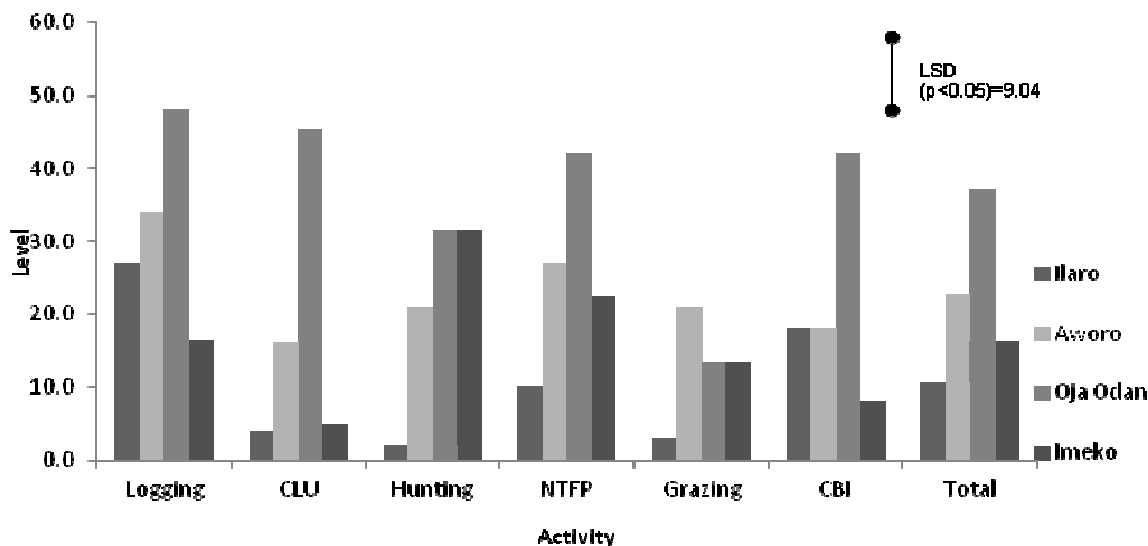


Figure 6: Overall activity levels by forest reserves

Table 1: ANOVA Result: Pressure and Threat Level across Forest Reserves

Sources of Variation	d.f.	s.s.	m.s.	v.r.	F pr.	
FOREST	3		4683.4	1561.1	11.67	<.001
LEVE	1		111.0	111.0	0.83	0.368
FOREST.LEVEL	3		421.1	140.4	1.05	0.381
Residual		40		5350.8	133.8	
Total		47		10566.3		

harvest (180). Degree of threat from grazing is high at 180 while CBI is moderate and CLU is mild at 80 and 20 respectively. Although logging in the Imeko F.R. is currently moderate, responses on the projection of respondents revealed that severe logging activity within the next five years is imminent; hence the severe (270) threat for logging. Of note is the highest severity of threat from hunting at 320 which corroborate the findings of Kiringe-Okello, (2007) which described relative threat factor index from hunting as highest in Kenya’s protected areas.

In general, the findings show that all the reserves are severely threatened by logging activities while only Oja-Odan is severely threatened by CLU. In addition, Oja-Odan and Imeko are the only reserves that are severely threatened by hunting, although Aworo F.R. is also highly threatened. Oja-Odan F.R. and Imeko F.R are severely threatened by harvesting of non-timber forest products while Aworo is also highly threatened by same activity. Furthermore, all the forest reserves are highly threatened by grazing except Ilaro F.R. while cross boundary influence severely threatened Oja-Odan F.R., although severity of threat in Ilaro F.R. and Aworo F.R. is high as well.

Results also revealed in Figure 6 that there is no significant difference (LSD = 9.04; $p < 0.05$) between activities in each forest reserves; although analysis of variance shows a significant difference between the pressure and threat across the forest reserves (Table 1). This finding also corroborates that of Kiringe-Okello, (2007) where levels of threat factors significantly differs among protected areas in Kenya. The finding that most of the protected areas in the Yewa division of Ogun state are threatened by a majority of threat factors implies that conservation in the state is more at crisis. The ever-increasing land demand in the country due to the increasing human population in rural areas has also put more pressure on protected areas as evident in threat levels for CLU and CBI especially in Oja-Odan and Imeko Forest Reserves.

CONCLUSION AND RECOMMENDATION

This study has shown that all the protected areas surveyed in Yewa division of Ogun state are threatened by all the identified human activities; though at different level of severity. Oja-Odan F.R. was however more

pressurized than all other protected areas in the division. More importantly is that managers, policy makers and partners look into this information and come up with policies that will critically help in prioritizing strategies in protected areas management, rather than the current haphazard approach.

REFERENCES

- Abbiw D (1989). Useful plants of Ghana. University of Ghana, Legon, Royal Botanic Gardens, Kew, London, England. In: FAO Corporate Document Repository. Available Online: <http://www.fao.org/docrep/t9450e/t9450e0t.htm>. Accessed on: 19/12/12
- Adetula T (2001). Encroachment and Its impacts on Forestry Development. A case study of Ondo State. *Journal of Tropical Forest Resources*. Vol. 17 (2) 2001. pp. 12-21.
- Adeyoju SK (1986). causes and consequences of deforestation in Nigeria. In Oguntala, A.B. (editor) *The Challenge of Deforestation in Nigeria*. Pp 113-124 F.A.N. Ibadan
- Adeyoju SK (2001). Forestry for National Development: a critique of the Nigeria situation in Popoola L, Abu J.E. and Oni P.I. (editors) *Forestry and National Development*. Proceedings of the 27th Annual Conference of the F.A.N. Abuja Nigeria pp 54-68.
- Adeyoju SK (1975). forestry and the Nigerian economy. University Press Ibadan Nigeria. pp 308.
- Adeyoju SK (2001). keynote address at ODSG/FAN CONSULT workshop on forest industries, environment and sustainable development in JTER vol. 17 (2) 2001 pp 1-4
- Aina AO (1986). some strategies for forestry development in Nigeria. In Oguntala, A.B. (editor) *The Challenge of Deforestation in Nigeria*. Pp 20-37 F.A.N. Ibadan
- Ajayi B (2001). wood wastes management in forest industries. In *Journal of Tropical Forest Resources* vol. 17(2) 2001 pp. 91-102
- Ajayi SS (1978). the Utilization of Tropical Wildlife: State of Knowledge and Research Priorities. Paper presented at the 8th World Forestry Conf. Djakarta. October 16-28. 1978
- Ajayi ST (1991). the control of forest offences in Ogun, Ondo and Oyo state of Nigeria. *Nigerian Journal of Forestry* 21(1&2): 25-28.
- Akindele SO (2001). Forest Assessment for Sustainable Development. In *Journal of Tropical Forest Resources* Vol. 17 (2) 2001 pp 35-40.
- Akindele SO (2001). Review of urgent management requirement for Nigerian forestry in Popoola L, Abu JE and Oni PI (editors) *Forestry and National Development*. Proceedings of the 27th Annual Conference of the F.A.N. Abuja Nigeria pp 75-84.
- Bada SO (1996). The Challenges of Forestry Development. Keynote Address Delivered at the Annual Workshop of Forestry Vocational training Centre, Dorayi, Kano, 5-7 March 1996 pp 5-13.
- Chanphaka U (1986). Watershed Management and Shifting Cultivation; three Asian approaches. Vol. 38 (15) pp. 22-27.
- Cheales NW (1985). the Potential of Timber Preservation as an aid to Forest Conservation in Developing Countries. In *Nig. Journal of Forestry* 11(2) 11-14.
- Eedy w (1997). Summary of the Vegetation and Land Use Changes Assessment of Nigeria between 1976/78 and 1993/95, proceedings of FORMECU Workshop Abuja May 1997.
- Ekeke BA and Osakwe ME (1986). bush burning and [poaching: impact on large mammal distribution at Kainji lake national park. In Oguntala, A.B. (editor) *The Challenge of Deforestation in Nigeria*. Pp 697-705. F.A.N. Ibadan.
- Ekwebalam SA and Onyewotu LOZ (1986). Management strategies for environmental forestry. Invited paper for a workshop on strategies for environment forestry management in Nigeria held at Kano, 18-15 June 1989. pp 1-30.
- Evans J (1983): *Plantation Forestry in the Tropics* 2nd edition. The English Language Book Society and Clarendon press. Oxford. Pp 367.
- FAO (1992). *Sustainable forest management 1992, 1088*.
- FAO (1979). *The Inactive inventory Of Reserved Forest in Southern Nigeria 1973-77 report prepared to the Government of Nigeria by the* FAO acting as executing agency for the UNDP. Based on the work of Herald Sulter, Forest Inventory Officer, FAO of the United Nations, Ibadan 1979. pp 381
- FAO (1991). *Assessing Forestry Project Impacts: Issues and Strategies*, Forestry Paper 114 FAO Rome pp71
- FORMECU (1998). *Assessment of Vegetation and land use changes in Nigeria between 1976/78 and 1993/95*, unpublished report prepared by Geometrics International Inc., Beak International Inc., and UNILAG Consult Pp221.
- FORMECU (1999). *Nigeria Forest Resources Studies main Report vol.III Priority projects. Project I – Integrated forest management* Geometrics International Inc., Beak International Inc., and Geometrics Nigeria Limited Pp39.
- Fuwape JA (2001). The Impacts of forestry Industries and Wood Utilization on the Environment. In *Journal of Tropical Forest Resources* Vol 17 (2) 2001 pp 78-88.
- Gbile ZO (1998). *Studies on Medicinal Plants*. Lecture delivered at the of Nigerian field society, Ibadan, June 15, 1988.
- Gomez-Bompa, et al (1972): *The Tropical Rainforest: A non renewable recourse*. Science, 177: 762-765.
- Harvey FL (1988). Final Report on Proposed Environmental Action Program. Vol. I. main Report I pp 2-3.
- Husain T (1989). Strategies for Environmental Forestry management in Nigeria. Heynte address at the three day workshop on forestry management in Nigeria, at Central Hotel Kano pp.1-6.
- Jimoh SO and Bada SO (2001). Private Participation in forest Plantation Development in Nigeria. In *Journal of tropical forest Resources* Vol 17(2) 2001 Pp 71-76.
- Lowe (1997). *Forestry and Forest Conversation in Nigeria*, commonwealth Review:63(2): pp129-136.
- Ndiomu CB (1985): Role of Forest Resources in the National Economy Keynote Address. 15th Annual. FAAN Conf. Yola .25-29th November 1985. pp. 1-16.
- Nwoboshi LC (1986). Meeting Challenges of the deforestation in Nigeria through effective reforestation. In Oguntala AB (Editor). *the challenge of deforestation in Nigeria*. Pp 225-238 F.A.N. Ibadan.
- Nwoboshi LC (1982). *Tropical silviculture. Principles and Techniques*. Ibadan University Press Ibadan p.51
- Nwoboshi LC (1989). *the need for environmental forestry management curriculum* (unpublished).
- Obe K (2001). afforestation: Ondo state afforestation project. paper presented at a one day induction course for the newly recruited forestry officers in Ondo state on 5th June 2001, pp 1-2.
- Ogigirigi ma (1986). effects of deforestation on environment degradation in Nigeria. In Oguntala, A.B. (Editor). *the challenge of deforestation in Nigeria*. Pp 48-57 F.A.N. Ibadan.
- Okafor cc (1986). the new role of private companies on afforestation projects in Nigeria. In Oguntala, A.B. (Editor). *The Challenge of Deforestation in Nigeria*. Pp 668-675 F.A.N. Ibadan.
- Olokuntoye SA (2001). forest management and timber exploitation in Ondo state. Paper presented at a one day induction course for the newly recruited forestry officers in Ondo state on 5th June 2001. pp 14.
- Omiyale O (2001). impact of encroachment on sustainable forest development. In *journal of tropical forest resources*. Vol. 17. (2) 2001.; pp 23-33.
- Onadeko SA and Meduna AJ (1986). Some Indication of the Ecological Impacts on Deforestation on Wildlife Conservation: In Oguntala AB (Editor). *The Challenge of Deforestation in Nigeria*. Pp 715-722 F.A.N. Ibadan.
- Onosode ai (1986): the challenge of deforestation to the Nigerian wood industry. In Oguntala, A.B. (Editor). *The Challenge of Deforestation in Nigeria*. Pp 668-675 F.A.N. Ibadan.
- Osemeobo GJ (1990). poaching in wildlife conservation: the experience in Nigeria. *Nigerian journal of forestry* 20 (1&2): 35-39.
- Popoola L and Akande JA (2001). an integrated approach to forestry sector impact assessment in Nigeria. In *journal of Tropical Forest Resources* Vol. 17 (2) 2001 pp 42-56.
- Spears J (1985). deforestation issues in developing countries- the case for accelerated investment programme. *Commonwealth Forestry Review*. 64 (4) pp 313-344.
- Steinlin HJ (1982). *Monitoring the World Forest*, Unasylva.

- Stopford, P. (1986). deforestation and wild life management. The case of the Nigerian national bird, In Oguntala AB (Editor). The Challenge of Deforestation in Nigeria. Pp 678-685 F.A.N. Ibadan.
- Udo, E. (1997). Forest Offences and Impediment to Forest Resources Conservation in Akwa Ibom State. In Oduwaye EA, P. Obiagu and J. Abu (editors) environment and resource development pp.44-51. f.a.n. Ibadan.
- Udo, E. (2001). Ethics and Professionalism in Forestry Development in Nigeria. In Journal of Tropical Forest Resources vol. 17(2) 2001 pp 5-10.
- Umeh, L. I. forest management in Nigeria: problems and the needed strategies; FORMECU pp 288.
- Umeh, L. I. (1986). deforestation: its extents and effects on Nigeria. In Oguntala, A.B. (Editor). The Challenge of Deforestation in Nigeria. Pp 668-675 F.A.N. Ibadan.