International Scholars Journals

African Journal of Wood Science and Forestry ISSN 2375-0979 Vol. 7 (5), pp. 001-006, May, 2019. Available online at www.internationalscholarsjournals.org © International Scholars Journals

Full Length Research Paper

Forest stakeholder's awareness of reduced impact logging (RIL) in Nigeria and Cameroon

A. L. Kehinde, J. A. Akande and E. Ntabe

[1]Department of Agricultural Economics and Extension, P. M. B. 284, Iwo Osun State, Nigeria.
[2]Department of Soil, Crop and Environmental Management, P. M. B. 284, Iwo, Osun State, Nigeria.
[3]Department of Forestry, Faculty of Agronomy and Agricultural Science, University of Dschang Cameroon.

Accepted 21 September, 2018

Damage associated with conventional logging practices is inconsistent with sustainable forest management. The Food and Agricultural Organization (FAO) model code of forest harvest, otherwise described as Reduced Impact Logging has therefore been advanced to reduce negative impacts on residual vegetation, soils and other environmental attributes. This study investigated the awareness rating of forest stakeholders on reduced impact logging (RIL) in Nigeria and Cameroon. Structured questionnaire and interview schedules were used to obtain information from 134 and 117 randomly selected stakeholders in Nigeria and Cameroon respectively. In Nigeria, results showed that environmentalists and non-govermental organizations have high level awarenes of RIL; the Federal and State governments, also forestry institutions have medium level awareness; while logging contractors, fellers, local forest users, traditional rulers, youth, and security agents have low awareness of RIL. In Cameroon, only the rural dwellers or resident forest users have low awareness of RIL. The timber harvest crew have medium level awareness while all other identified stakeholders showed high wareness. In the two countries, all the stakeholders showed positive leaning towards accepting RIL for its advantageous social impact technological content, mode of standard enforcement and environmental impacts.

Key words: Forest stakeholders, reduced impact logging, environmental education.

INTRODUCTION

Timber is a major forest resource in the extensive rain forests of Nigeria and Cameroon. Nigeria has a total surface forest area of 11,089,000ha while Cameroon a surface area of 21,245,000ha and this represents part of the colossal rich forest of the Congo Basin (FAO, 2005). The rain forest is home to over 300 of merchantable tree species in Cameroon and over 52 species in Nigeria. Some of the economically valuable species in this countries are; *Triplochiton scleroxylon, Mansonia, altissima*, *Khaya ivorensis*, *Milicia excelsa*, *Terminalia superba*, *Afzelia Africana*, *Terminalia ivorensis*, *Cedrela odorata*, *Cordia milenii, Mitragyna ciliate, Nesorgodonia papaverifera, Nauclea didderichii, Brachystegia eurycoma* Keay (1989).

Timber harvesting is a very important industrial phase but the exploitation process must be carefully managed for sustainability. Regrettably, timber harvesting in Nigeria is generally devoid of logging plans and the technology employed could be damaging to residual vegetation. One is apt to agree that the ability of a country to follow a sustainable development path is often determined by the capacity of its people and intuitions. A decision to pursue Sustainable Forest Management (SFM), as a development strategy, must, of essence, analyze timber harvesting practices and associated ecological impacts. It should also encourage institutional effort and support in concert with the participatory role of the nation's forestry professionals. Nevertheless, log tracking and control in the study countries are facilitated by central inventory and hammering. The protocol also demands the establish-ment of control check points, payment of regeneration fee which is often ignored. Felling site assessment after logging shows ecological damage of some remaining standing trees, while saplings and wildings of economic value were inadvertently destroyed. This exploitation pattern is not sustainable and suggests that

*Corresponding author. E-mail: tjgreenk@yahoo.com. Tel: 234-8037860000.

foresters, planners and logging operators need guidance on desirable forest harvesting techniques and the kind of practices that are socially acceptable.

The primary purpose of the Food and Agriculture Organization model code of forest harvesting practice is to serve as reference document for member countries (Dykstra, 1998) to adapt in solving their peculiar logging problems. The focus is to promote forest harvesting practices that improve the standard of utilization, reduce environmental impacts, ensure that forest are sustained for future generations and improve the social and economic contributions of forests to sustainable developments (FAO, 1977; 1993; 1996). This set of timber harvesting practice has the following core objectives (Dykstra, 2004);

- Pre-harvest inventory and mapping of individual crop trees.
- Pre-harvest planning of roads, skid trails and landings to provide access to the harvest area and to the individual trees scheduled for harvest while minimizing soil disturbance, protecting streams and waterways with appropriate crossings.
- Cutting of vines prior to harvest in areas where large woody vines tend to form webs that connect tree crowns.
- The use of controlled felling and bucking techniques, including directional felling, cutting stumps low to the ground to avoid waste and optimal cross-cutting (bucking) of tree stems into logs to maximize recovery.
- Construction of roads, landings and skid trails so that they adhere to engineering and environmental design guidelines.
- Winching logs to planned skid trails and ensuring that skidding machines remain on the skid trails at all times.
- Where feasible, utilizing yarding systems that protect soils and residual vegetation by suspending logs above the ground.
- Conducting post-harvest assessments to provide feedback to the timber concession holder and the logging crews, and to evaluate the degree to which RIL guidelines were applied successfully.

Without gainsaying, RIL is more environmentally friendly than the conventional logging method and guarantees sustainable forest management. In brief the fundamental paradigms (IUCN 2006) include:

- Planning and adherence to all extraction ideals such as layout of Forest Management Units (FMU), stock mapping, roads, stream crossings, loading bays, skid trails and location of camps to minimize damage thereby avoiding environmentally sensitive areas and biodiversity conservation areas.
- The use of directional felling when possible to minimize gap size, protect future harvest trees and favour skidding direction to avoid additional damage.
- The integration of stock maps with sound yield allocation procedures, controlling the spatial distribution of logging and indicating trees and or sites to be protected.
- The planning of skid trails using individual tree (stock) maps and provision of information to avoid additional impact.
- Minimize the length of skid trails using and limiting the volume to be extracted to avoid excess impact. Avoiding steep gradients for skid trails and if possible sticking to ridge tops, winches and the use of cable for skidding.
- Planning of extraction during dry season (in moist forest) but avoiding the driest seasons in highly fire-prone forests.
- Protection of streams and river buffer zones according to regional regulations and or conservations conventions during road building, skidding and felling activities.

These propositions suggest that if RIL will succeed, log harvesting would require participatory efforts from the different forest stakeholders. The International Tropical Timber Council (ITTC) had therefore encouraged all International Tropical Timber Organization (ITTO) producer countries to apply reduced impact logging (RIL) and train the workforce in the art.

However, one should submit that in most participatory Forest Management (PFM) situations, local forest users derive a range of benefits from the forest (ITTO, 2003a) some of which are marketable many of which are sub-sistence products and others are non-tangible or non- market benefits. The different stakeholders value impact and output from the forest in allusion to their primary shareholding objectives viz; poverty alleviation, environmental security, profit maximization, sustained security in the way of productive resources and available technology (Lampietti and Dixon, 1995).All these concerns have motivated the need to investigate forest stakeholders' level of knowledge on RIL in order to:

- Tag the different forest stakeholders to their roles as determined by levels of need, also to
- Appraise the level of awareness of the stakeholders on reduced impact logging system.

MATERIALS AND METHODS

Production forests in Nigeria occupy an area of 2,720,000 ha (ITTO, 2005). These comprise forested States and regions with significant logging activities. They fall within the latitudes 4 - 8°N and comprise of Oyo, Ondo, Ogun, Delta, Kogi, Benue, Akwa Ibom and Cross Rivers States in Cameroon, there are 74 forest concessions. 3,424,606 are allocated for conservation, 12 million ha for production forests, 5,737,000 already allocated for logging, 3,495,187 ha are considered sustainably managed and 41,965 ha have been classified certified forests. Head offices in project state and Federal Departments of Forestry were visited and management officers interviewed following drawn up questionnaire. Wood industries in surveyed region were also visited and their log control officers as well as round wood buyers interviewed. Likewise in Cameroon, forested provinces (East, South, Centre, South west and Littoral provinces) with significant logging activities located in the southern forested zone of the country were surveyed. Visits were paid to the Ministry of Forestry and Wildlife, the Ministry of Environment and Nature Protection, Douala and Kribi Seaports,

Table 1. Timber resource use incentives and RIL awareness ranking of identified stakeholders in Nigeria and Cameroon.

S/N	Stakeholder	Resource use incentives	Awareness of RIL* in Nigeria	Awareness of RIL* in Cameroon
1.	State/ provincial Forestry Officials	Revenue collection and personal enrichment	Medium	High
2.	Logging contractors	Profit (net returns on invested funds)	Low	High
3.	Timber harvest crew	Maximize quantum and yield of harvested logs	Low	Medium
4.	Road and environmental engineer	Professional responsibility / personal income	High	High
5.	Inventory / Mensuration officers	Sustained yield management; personal income	High	High
6.	Timber marketers (saw millers and timber sellers)	Profit motivation	Low	High
7.	Resident forest users/ rural people	Improved income and livelihood	Low	Low
8.	Traditional rulers, community leaders and youths	Sovereignty and resource control	Low	High
9.	Security apparatus	Taxes and personal gains	Low	High
10.	Forestry institutions	Training, research and extension	Medium	High
11.	Federal Forestry Officials	Management for sustainability	Medium	High

The State forestry officials consist of professional forest officers (conservators); the uniform field staff (forest guards); technical forest superintendents; chief ranger as supervisors; also headquarter patrol team that monitors the field staff. ***** RIL awareness rated low, medium and high based on respondents response to selected questions on RIL.

provincial and divisional delegations of forestry in target provinces as well as head offices of logging companies and NGOs. In all 134 and 117 stakeholders were randomly selected and interviewed using a well drawn up questionnaire, in both countries. A comprehensive list of stakeholders interviewed in the course of this study include the Federal Forest Office, State Forest Office/ Commission/Provincial forest offices, Council forest management boards, Community management boards, Forest guards, Logging contractors, Fellers, business persons, NGOs, environmentalists, forest owners (including traditional rulers and youths) , local forest users and other technical experts.

RESULTS AND DISCUSSION

The important stakeholders identified in log harvesting were; (1) State and provincial governments (2) FEDERAL Forest Officers (3) Logging contractors (4) Fellers (5) NGOs (6) Environmentalists (7) Forest community residents including traditional rulers, able men women and youths (8) Local forest users and rural people (9) Forestry institutions (10) Security agents (11) Saw millers and (12) Builders for Nigeria and (1) The Ministry of Forestry and Wildlife (2) Provincial delegations (3) Divisional delegations (4) Concession holders (5) Holders of SSV (6) Timber contractor (7) Rural dwellers, (8) NGOs (9) Forest guards (10) Community management boards and (12) Council Forest Management Boards for Cameroon.

Resource use incentives of identified stakeholders, in Nigeria and Cameroon and their awareness ranking of the reduced impact logging practice is shown in Tables 1 and 2. The overall average perception of RIL in Nigeria timber harvest management is low and this needs improvement through sensitization, training workshops, seminars etc.

In Cameroon, where RIL is relatively acknowledged, the FAO model code of harvest practice is visible but institutional and legal frameworks are not regularly applied. Involvement of high ranking government and military officials in the forest sector constitute major setbacks. Illegal logging, logging outside official regulation; non-respect for felling girth and other offences are rampant. Nevertheless, different stakeholders perceive that RIL is an acceptable concept and should be encouraged particularly to enhance forest environmental control and sustainability features. To achieve such feat demands proper pre-harvest planning, mapping and inventorization of merchantable stocks, road construction and skid rails and feedback mechanism arrangement through monitoring and evaluation. Directional felling and post- harvest assessment are also pertinent in harvest management for RIL to work.

Down-stream dependants in forested areas experience both positive and negative impacts as a result of these activities. When logging activities are properly managed, skid trails open access roads into the forest areas for the people; branches of felled trees are collected as fuel wood; participation in log harvesting provides income generating

Table 2. Identified stakeholders' involvement in timber harvesting.

Stakeholders	% Respondents	Expected role
Forest guards	100	Surveillance, fight against poaching and ensuring respect for legal provisions
Logging operators	100	Application of logging norms
Supervisors	100	Administrative, planning and follow-up of logging activities
Divisional delegates	100	Advisory and supervisory
Provincial delegates	100	Advisory and supervisory
Governors	100	Facilitators in conflict management
Timber contractors	100	Inventory, purchase and sales
Forest industry managers	100	Choice of species, application of the law, control and coordination of logging activities
NGOs	60	Promote transparency, defense of minority rights, environmental protection, sensitization and certification
Local communities	30	Joint management and waste retrieval
Educational institutions	15	Training and capacity building

generating activities and in the process attenuates rural-urban migration. On the other hand logging activities have been implicated for unwanted fragmentation of the forest ecosystem; loss of wildlife and wildlife habitat; erosion and reduction in soil fertility.

In this study, interaction with the different stakeholders in log harvesting revealed that multi- stakeholder partnership in log harvesting could create a win-win opportunity by (i) encouraging community, communal and private forestry (ii) facilitating institutional and legal frame-works to make the establishment of communal forestry a reality (iii) encouraging a central monitoring system and rewarding best harvesting practices (iv) facilitate improved agro forestry practices while (v) justifying the essence of building infrastructure to take care of down stream dependants.

The State forestry officials consist of professional forest officers (conservators); the uniform field staff (forest guards); technical forest superintendents; chief ranger as supervisors; also headquarter patrol team that monitors the field staff; ***** RIL awareness rated low, medium and high.

Sole government management of timber harvest is beset with inadequate knowledge of the socio-cultural, technology, environment and economic content of the ecosystem. Very often, regeneration effort is consistent with the quantum of revenue derived from the resource merchandise. The political powers are tilted and often show commitment to log harvest rather than emphasizing plough back into regeneration. Forest health is impaired while misguided harvest is poorly recorded and also results in poor market price for the commodity.

All efforts are needed to dissuade political authorities from exercising misguided extraction of timber from established forest estates. Also to carry along stakeholders, it may be useful to carve out community forest slots to take care of grass root dependants. It is worthwhile mentioning that the Forestry Commission in Cross Rivers State, Nigeria and forest management options in Cameroon are corrigibly advancing towards sustainable harvest management practices. Up till the year 2004, when the government put a moratorium on log exploitation, previous governments, like in many forested stated of Nigeria, have the power to influence what company gets a forest concession area without regard to the original harvest plan. In many instances, the forestry trust fund meant for regeneration and management had been mismanaged or misappropriated.

The stakeholders in log harvesting in the project countries include the state and provinces, Loggers, Local communities, NGOs and Consultancy outfits. The varied interests in the use of forest resources include commercial, transformation, agriculture and food supply, NTFPs (fuel wood, chewing stick, medicinal herbs, leaves gathering) and environmental. Based on response to the research questionnaire, Table 2 shows stakeholders role and involvement in timber harvesting.

The stakeholders, in general, felt that participatory and sustainable harvesting could be achieved through; (i) joint management (ii) respect for legal prescriptions (iii) provision of social amenities to local communities (iv) log certification (v) application of reduced impact logging and (vi) Periodic capacity building of personnel. The priorities of a forest manager on a stand to be harvested should, of necessity, include the identification of exploiter; knowledge of area in question; preparation of all legal documents related to the area; delimitation of area; preparation of management plans; socio-economic studies and respect for all legal provisions. *Pari-pasu*, the priorities of a forest manager on an already harvested stand should be to ensure that all legal provisions were respected right from extraction to regeneration process;

closure of roads and bridges that could be destroyed by logging crew; in-situ evaluation of the logging process.

STAKEHOLDER AWARENESS OF FAO MODEL CODE OF FOREST HARVEST

Result of the survey showed 76% of the respondents claiming affirmative with respect to their knowledge of the FAO model code of timber harvesting standard. 24% responded to the contrary. When asked about the potent desirability of the FAO model code, every respondent felt that the process is desirable. They, however, expressed reservation as to the problem of dogmatism, added time and cost required of the model. The study also reveal that selective logging is practiced by all loggers in Cameroon while 61% of existing logging companies apply RIL which had been found to stand density; giving respect for minimum dimensions of harvested trees; also environmental protection because it provides minimum collateral damage during harvesting. Conversely, selective logging, as currently practiced causes high collateral damage.

The mean forest area per logging company 256,188.5 ha while the mean number of FMUs for companies surveyed is 3.28. The mean operational age of companies in the logging business is 29 years. Forty three percent of them felt that the forest area allotted them for exploitation is sufficient for their capacity while 57% felt otherwise. The factors guiding against arbitrary increase in the size of allocated forest are the 1994 forestry law; lack of enough forest; lack of finance; excessive taxation; technical difficulties and administrative bottlenecks. All loggers interviewed have harvest plans are updated every five years.

Harvest stands are linked by primary and secondary roads. The mean width of the primary road is 8 m while the secondary roads are 5 m wide. All the logging companies have road management plans with construction provisions (i) no road construction on hydromorphic soils (ii) no road construction in areas of high species density (iii) respect of logging regulations (iv) road network planning (v) construction of roads at least 60m away from water courses (vi) use of crest or contour lines (vii) adherence to recommended road widths.

Logging impacts on harvested sites are minimized through proper road network planning; planning of skidding trails; use of forest maps; directional felling; respect of logging regulations; sensitisation of all stake-holders; pre-inventory and planning of logging activities; preservation of trees located up to 40 m away from water courses; seedling preservation; avoidance of water courses blockage. All the loggers use forest maps and prefer to operate more in the dry season. Unfortunately, only 29% of the loggers regenerate logged sites even though all are conscious of legislation guiding their operations.

Harvesting groups that constitute serious environmental menace include the illegal exploiters, farmers and holders of sales of standing volumes (SSV). Officially, 10% of revenue collected from the annual forestry fee goes to concerned local communities but this amount seldom reaches the grass root dependants.

Conclusion

The underlining mechanism for Reduced Impact logging lies in stakeholder participatory management: a governance arrangement that does not preclude ownership right; that creates job opportunities and reward participation and best practices. In general, Cameroon forest stakeholders have greater awareness of RIL compared to their counterparts in Nigeria. In Nigeria, only the environ-mentalists and non-govermental organizations can be said to have high level awarenes of RIL. The Federal and State governments, also forestry institutions have medium level awareness; while logging contractors, fellers, local forest users, traditional rulers and youth, and security agents have low awareness of RIL. In Cameroon, only resident forest users have limited awareness of RIL. The timber harvest crew has medium level awareness while all other identified stakeholders can not deny adequate wareness. In the two project countries, all stakeholders, showed positive leaning towards accepting RIL for its beneficial social impact, technological content, mode of standard enforcement and environmental impacts. It is recommended that stake-holder meetings on forest harvesting be held regularly to educate the public and advance the need for regulated logging practices.

ACKNOWLEDGEMENT

The authors appreciate the financial contribution and permission of the African Forestry Research Network (AFORNET), Nairobi, Kenya to carry out and publish this work.

REFERENCES

Dykstra DP (1998). Historical background and conceptual framework of the FAO model code of forest harvesting practice. IUFRO XX World Congress. Sweden. pp: 57-63.

Dykstra DP (2004). RILSM 2.0 User's Guide. Software for financial analysis of reduced-impact logging systems. Asia-Pacific Forestry Commission. pp: 120.

FAO (1977). Planing forest roads and harvesting systems. FAO Rome. FAO Forestry paper. pp: 148.

FAO (1993). The challenge of sustainable forest management: What future for the world's forests? FAO, Rome. ISBN 92-5-103370-6. pp: 128.

FAO (1996). FAO model code of forest harvesting practice. FAO Rome. ISBN 92-5-103690-X. pp: 85

FAO (2005). Global Forest Resource Assessment- Forest facts by country http://www.fao.org/forestry/32185/en/nga/

ITTO (2003a). Tropical Forestry Update. 13(4): 1-32.

ITTO (2005). Status of Topical Forest Management http://www.itto. int/en/sfm_detail/id=12350000.

IUCN (2006a). Illegal Logging: A commitment to change through tripartite action. Forest Law Enforcement and Governance (FLEG). pp: 11.

IUCN (2006b). Strengthening voices for better chances. Global forest Governance Project Report. pp: 4
Keay RWJ (1989) Trees of Nigeria. Clarendon Press, Oxford, pp: 476
Lampietti J , Dixon J (1995). To see the forest for the trees: A guide to non-timber forest benefits. Environment Department Paper 013. Pollution and Environmental economics Division, World Bank, Washington, DC.