

Evaluation of Artisanal Logging Sector in Democratic Republic of the Congo: A Case Study of Peri-urban Forest of Gbadolite City, Nord-Ubangi

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Abstract

The Democratic Republic of the Congo represents more than 52% of the forest of the Congo basin and this one permits to satisfy the needs of populations living in the forest regions into wood and food products. The aim of the present study was to assess the artisanal logging sector in Gbadolite city. The findings show that this activity is more performed by men (87%) while the majority of sawyers has a secondary study level (56.7%) and exercise the sawing activity two to three years (46%). Agriculture (66.7%) is the best alternative activity to the artisanal logging meanwhile *Triplochiton scleron*, *Entandrophagma cylindricum*, *Milicia excelsa* and *Alstonia boonei* are the most exploited species; the chain saw is the most used tool (50%); then the rafter is the most sold product (55%). However, the majority of logging functions in private are characterized by the absence of fiscal culture (73%). For a sustainable and compatible forest management with the maintenance and renewal of the resource, it is urgent that the provincial Government regulates the artisanal logging by applying the law rigorously on the subject while fixing the principles destined to assure the protection, the conservation and the management of the phytogenetic resources in the peri-urban forest of Gbadolite city. Besides, it is also desirable to list and to identify all actors intervening in this sector in order to sensitize them on the sustainable exploitation of the forest resources and their contribution to the development of the Nord-Ubangi.

Keywords

Artisanal Exploitation, Wood of Work, Peri-urban Forest, Habitat, Fragmentation

Received: February 11, 2019 / Accepted: July 2, 2019 / Published online: July 12, 2019

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1. Introduction

The Democratic Republic of the Congo (DRC) is located in the heart of Africa and covers an area of 2,345,000 km². It has about 145 million hectares of natural forests, ca 10% of all tropical forests in the world and more than 47% of

African forests. The DRC represents more than 52% of the forest in the Congo Basin, which is the largest tropical forest massif after the Amazon [1]. These forests are rich in both animal and plant biodiversity and play an essential role in the global climate regulation at the planetary level [2-6]. These forests also have a clear socio-economic importance for the

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local and indigenous populations who live there and depend heavily on them for their survival. In fact, these forests allow the population of these forest regions to satisfy their needs in woods, medicinal plants and food products [7-11]. In particular, the artisanal exploitation is one of the income-generating sectors for several stakeholders living in forest regions. This activity is less explored and the available data are not sufficient in order to provide a sufficiently clear understanding of the production chain [12-13]. Nord-Ubangi province, precisely Gbadolite city and its surroundings have an enormous potential for forest resources but are suffering from rampant deforestation due to artisanal exploitation to meet local needs due to ever-increasing demographics.

However, the strong demand for wood-based products such as planks, chevron and beams is an additional factor leading to accelerated degradation of forest resources in the Province. This research was initiated to evaluate the artisanal wood sawmill sector in Gbadolite city. Its specific objectives were to know the number of sawmills, to identify the stakeholders involved in the production chain, to know the sawmill products and their functioning and finally to estimate the average price of sawmill products in Gbadolite city.

2. Materials and Methods

2.1. Study Area

The study was carried out in the city of Gbadolite (Latitude: 4° 16' 41" North; Longitude: 21° 00' 18" East; Altitude: 300-500 m above the sea) notably by following the Mobayi and Molegbe axes, in the forest where the wood is cut and the points where it is sawn and stored. Gbadolite city is located in the Ubangian ecoregion, a subgroup of the Northeastern Congolian lowland forests [14]. This ecoregion is one of the 200 globally priority terrestrial ecoregions known as the "G200" [15].

2.2. Study Design

This research employed a descriptive study design whereby the characteristics of respondents were described. The choice of this design was required by the nature of the issue being studied. The community was selected because it has been practicing the sawing. The researcher had discussions with key informants and stakeholders at the community level i.e. randomly sampled respondents.

2.3. Method

A purposive sampling is entirely based on the judgement of the researcher in that a sample is composed of elements that contain the most characteristics, representative or typical attributes of the population. The questionnaire enabled structured social interaction between the researcher and the

sawyers thereby providing an opportunity to obtain quantifiable and comparable information related to the study. Then was identified the sawyers, the place of processing, the cut wood by using a participatory approach targeting different groups or individual. The sample size was of 30 individuals of whom the selection was based on their level of knowledge on the sawing sector.

2.4. Data Analysis

All data collected from the questionnaires were coded and transferred to Excel 2016 where findings were presented in a descriptive form through summary measures such as frequency and percentage distribution in a tabular form.

3. Result and Discussion

3.1. Socio-demographic Characteristics

The socio-demographic characteristics of the respondents is presented in the table below.

Table 1. Socio-demographic characteristics of respondents.

Variables	Frequency (n=30)	Percentage (%)
Sex		
Male	26	87
Female	4	13
Age (years)		
15-29	8	27
30-49	19	63
50-69	3	10
Education level		
University	8	27
Secondary	17	57
Primary	5	16
Religion		
Jehovah's witnesses	2	7
Protestant	8	27
Muslim	2	7
Kimbanguist	5	16
Catholic	13	43
Number of years spent in the activity		
10 years	1	3
7 years	2	7
6 years	3	10
5 years	5	17
3 years	7	23
2 years	7	23
1 year	4	14
3 months	1	3

It was observed from the above table that respondents of the age range between 30-49 years constitute the majority while this activity is more carried out by male than female. Regarding the education level, 57% of sawyers have a secondary level, followed by 27% of respondents having the university level and the last group of respondents have a primary level (17). In fact, once young people finish their high school level, most of them are found unemployed and cannot embark on university studies, they prefer to engage in

informal activities such as sawmilling.

As to the religion, it was observed that 43% of respondents are Catholics, 26% are Protestants while Kimbanguists constitute 16%. This observation is true because this city is predominantly dominated by Catholic churches and Protestants whereby they believe that these activities allow them to survive but also in the production of benches serving as seats in these churches. They can also serve in other activities. However, the majority of sawyers (23%) have two to three year experience in sawing wood while 17% have 5 years' experience. With these findings, it is shown that few people who are in the sawmilling activity have 10 years of experience (3%). This information shows that sawmilling in Gbadolite city and its surroundings has existed in this community for decades. However, this activity always attracts new players, who invest themselves in it and make this activity their priority.

Alternative activities performed by sawyers in this territory is presented below (figure 1).

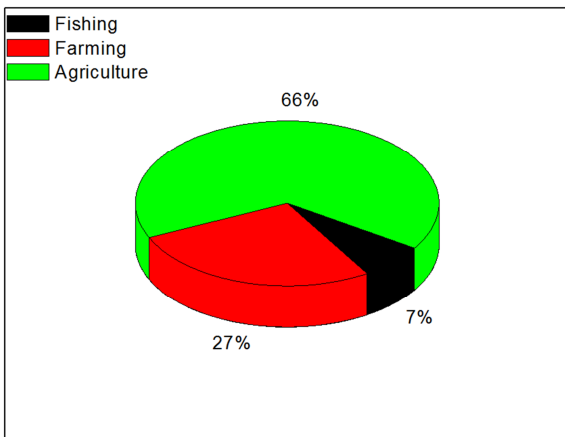


Figure 1. Alternative activities undertaken.

From the figure above, it should be observed that these sawyers are engaged in other activities apart sawmilling. They are engaged in the following activities namely: in agriculture (66%), livestock (27%) and fishing (7%). This is justified by the fact that field and livestock products can provide food for the sawyers themselves and their employee instead of buying food stuff on the market which are expensive to them.

Figure 2 gives the respondents' opinion on the knowledge of forest resources.

This figure shows that the respondents have knowledge of forest resources namely: mammals (21%); trees (20%) and fungi (20%). The surveyed population also knows Forest resources such as rattan, caterpillars, snails, wild fruits, etc.

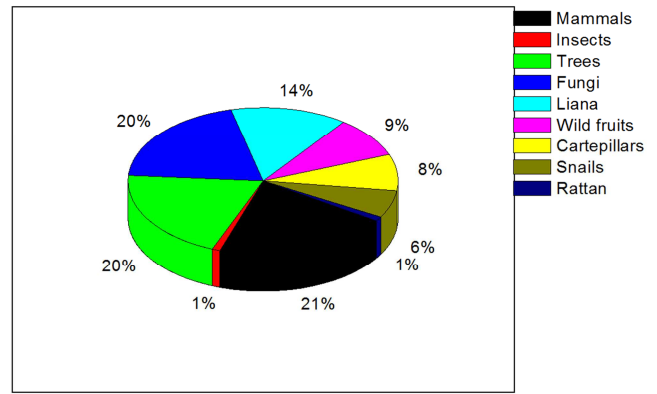


Figure 2. Knowledge on forest resources.

Figure 3 shows the plant genetic resources that are intended for sawing.

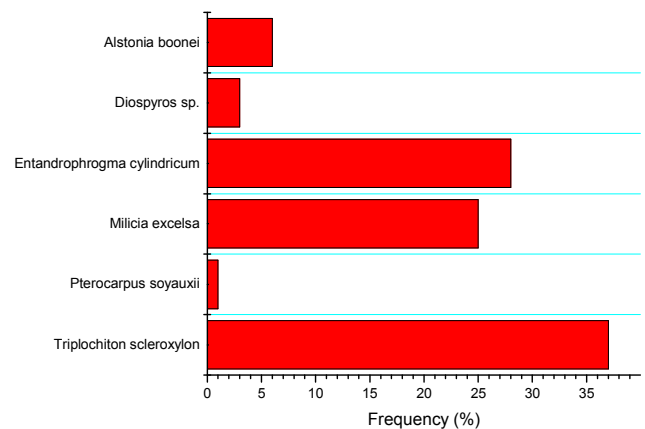


Figure 3. Resources that are intended for sawing.

It was observed that artisanal sawyers are more particularly interested in certain plant species to carry out their work. Other are interested in using high quality wood such as *Triplochiton scleroxylon* (Gbadogbado), and other interested in red and/or white wood such as *Entandrophagma cylindricum* (Mboyo), *Milicia excelsa* (Mbangi) and *Alstonia boonei* (Guga).

Figure 4 presents the number of sawmills in Gbadolite city and their operation.

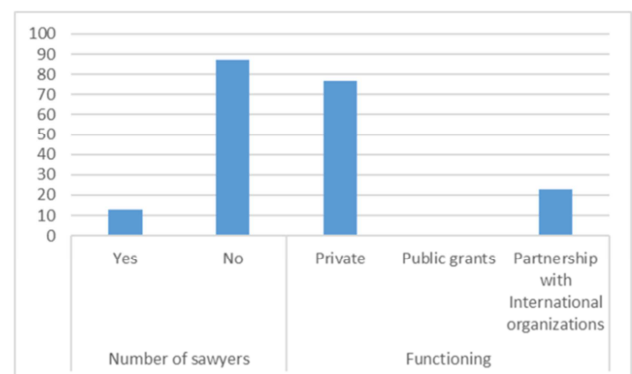


Figure 4. Knowledge on the number of sawmills in the city and their functioning.

From the above figure, it is observed that 87% of the respondents are unaware of the number of sawyers in Gbadolite city. Since their number is not controlled, it is also difficult for the sector to be organized. With regard to the operation of sawmills in Gbadolite city where 77% of sawmills operate privately. This situation shows the total absence of the State in the sawmill sector.

Figure 5 shows the type of engines used by Gbadolite sawyers.

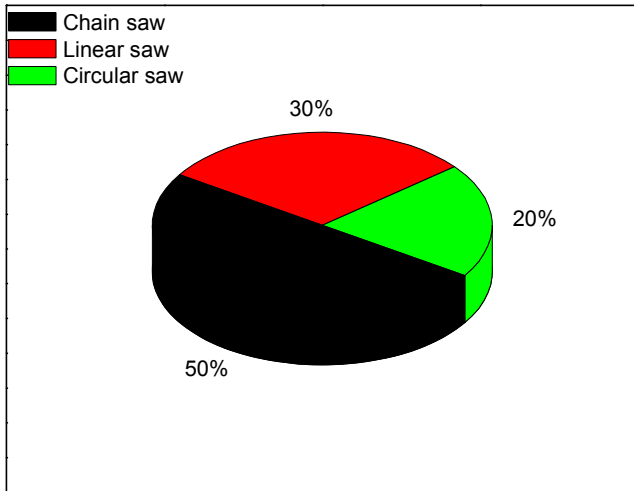


Figure 5. Types of used engines.

It was observed that the most commonly used material in the artisanal timber production chain is the chain saw (50%) followed by linear saw (30%) and circular saws (20%).

Figure 6 presents the different types of sawmill products delivered to the market of Gbadolite city.

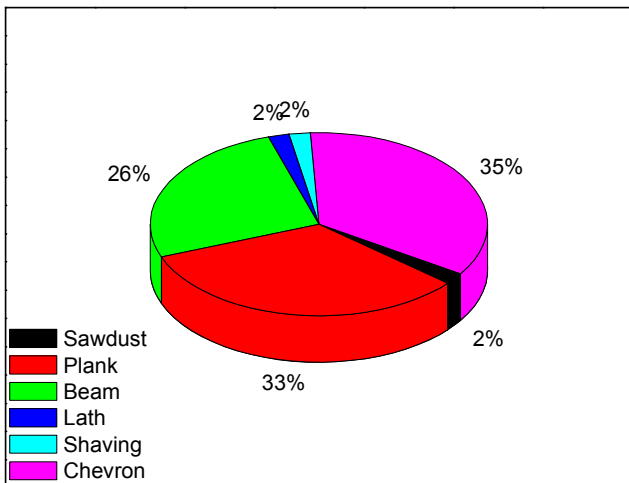


Figure 6. Sawmill products.

As observed, the most delivered sawn product is the chevron (35%) followed by planks (33%) and beams (26%) respectively. The other products are delivered but at a very low proportion.

The most popular sawn timber products on the local market is presented in the figure below.

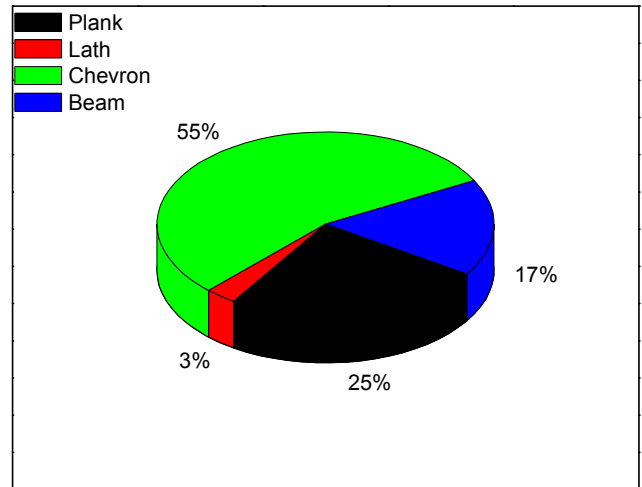


Figure 7. The best-selling sawn timber products on the local market.

It was observed that chevrons are more sold (55%), followed by planks (25%), beam (18%) and lath (3%) respectively. Knowing that Gbadolite is a cosmopolitan city where people come from the world looking to build new houses in this area i.e. these products are in high demand for this work.

Figure 8 shows the different ways of selling artisanal sawmill products

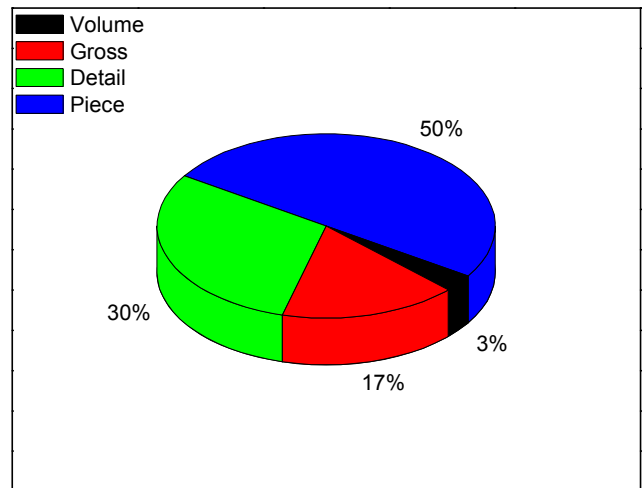


Figure 8. Selling mode.

The above figure shows that 50% of the products are sold in pieces, followed by 30% of the products sold in retail. Wholesale and cubage sales represent 16.7% and 3.3% respectively. With regard to the profitability of sawmill products, our results show that out of a sample of 30 people surveyed, 17 or 56.7% confirmed that the products sold on the market are profitable. On the other hand, 13 people or 43.3% said the opposite. This means that if the sector were well organized, it would benefit the State through the taxes

that farmers, lumber sawyers, can pay.

Figure 9 shows the price (in USD/m³) of different products on the local market.

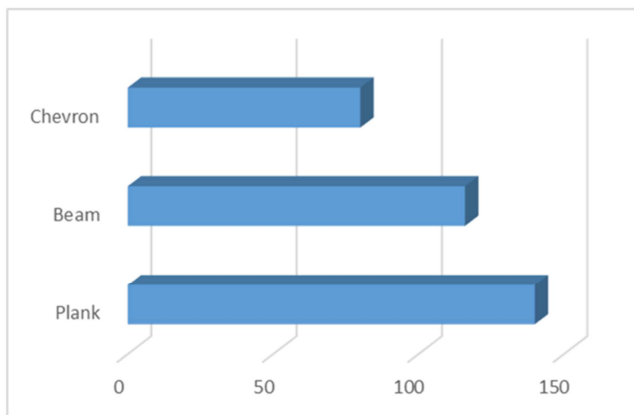


Figure 9. Price of products in the market (in USD/m³).

According to the answers obtained from the respondents, the price for each product is finally around US\$139.8 per cubic metre for the plank, US\$116 for the beam and US\$79.2 for the chevron.

With regard to the knowledge on the importance of sawdust and wood chips, the findings of this research show 90% of respondents ignore the importance of sawdust and wood chips. While only 10% have knowledge about the importance of sawdust and wood chips. This small proportion is justified by the fact that these sawyers are mostly laymen and are unaware that these products can be transformed into cabinets, doors and used as energy sources. The findings also reveal that 73% of respondents are not familiar with the texts and laws (forest code) that regulate the forest, while 27% know the existence of rules and regulations i.e. they know that there are standards or laws that regulate the forest. As far as the payment of taxes is concerned, 60% do not pay taxes compared to 40% who pay forest taxes regularly.

Artisanal wood mining is an important economic activity due to the number of economic operators it employs in Gbadolite city. Given its importance, artisanal logging is expected to provide a significant source of revenue for the North Ubangi province and thus promote the development of timber collection areas. Unfortunately, the revenues generated do not reach the State coffers to a large extent and the local communities lack basic infrastructures. Artisanal foresters who are the major stakeholders in this sector are not subjected to the payment of legal fees and taxes.

Since the consumption of timber (*Triplochiton scleron*, *Entandrophagma cylindricum*, *Milicia excelsa* and *Alstonia boonei*) exceeds their natural rate of renewal, it is to be expected that the scarcity of lined products would increase the poverty of households that depend on this activity, thus

exacerbating human pressure on peri-urban forest ecosystems and the fragmentation of wildlife habitats.

4. Conclusion and Suggestions

This study was initiated in order to evaluate the artisanal lumber sawmilling sector in Gbadolite city. According to this survey, this activity is carried out more by men than women; the majority of sawyers have a secondary level of education and have been engaged in sawing for two to three years. The main alternative activity to artisanal sawing is agriculture; while plant species such as *Triplochiton scleron*, *Entandrophagma cylindricum*, *Milicia excelsa* and *Alstonia boonei* are the most exploited plant genetic resources; the chain saw is the most widely used tool; the chevron is the most sold product on the local market. However, the majority of sawmills operate privately and this informal sector is not regulated by law in Gbadolite although it is profitable (lack of fiscal culture).

For sustainable forest management that is compatible with the maintenance and renewal of the resource, it is urgent that the provincial government regulate artisanal logging by strictly applying the law in this area by establishing principles to ensure the protection, conservation and management of plant genetic resources in the Gbadolite peri-urban forest. In addition, it is also desirable to list and identify all the actors involved in this sector in order to raise their awareness of the sustainable exploitation of forest resources and their contribution to the development of Nord Ubangi.

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