

## CAPACITY OF SAWMILLS AND CARPENTRY WORKSHOPS FOR PROCESSING LESSER USED SPECIES IN GHANA

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### ABSTRACT

*In Ghana, the exploitation of timber is limited to a few of the over 300 known species. Majority of the species are not being utilized because their properties (including physical, mechanical and machining properties) are not known. Due to this, sawmills hardly process these lesser used species. To avoid the overexploitation of commercially known species the use of lesser known ones is inevitable. The objective of the study was to assess the capacity of the sawmills and carpentry workshops in terms of their machinery to process lesser used timber species for efficient utilization. Eight (8) of the sawmills in Kumasi, Ghana were randomly selected and questionnaires were administered and interviews conducted. Forty-five (45) carpenters granted interview and responded to questionnaires that were administered. The sawmills have the needed cutting and processing machinery for producing lumber from commercially known species but not the lesser known ones. Some sawmills expressed difficulty in sawing some lesser used timber species due to their extreme hardness and smaller diameter sizes even though they possess adequate strength for utilization. Most of the carpentry workshops (60%) use only simple hand tools for processing which makes the utilization of these lesser known species in construction very difficult. The use of advanced technology and efficient processing techniques need to be encouraged for the processing of these species. This will ensure efficient utilization in order to reduce the overexploitation of the commercial (traditional) timber species.*

**Keywords:** sawmills, carpentries, processing, lesser used species, timber

### INTRODUCTION

Majority of the tree species in Ghana are not being utilized because most of their properties are not known. The exploitation of timber is limited to a few of the over 300 known species. Until now less than about 100 tree species are seriously commercially utilized and the rest unexploited (Ayarkwa, 2009). There are a number of timber companies, which produce timber to the required sizes in commercial quantities (Baiden *et al.*, 2005) but most of them hardly process the lesser used species.

Within the framework of timber as a construction material, a distinction is made between primary or commercially accepted species and lesser known or less accepted species. For several reasons, the use of timber in construction in recent times is dependent on lesser known timber species rather than commercially accepted species. Freezaillah (1990) defines Lesser-known species (LKS) as a commercially less accepted species left in the forest after a logging operation. But, as stated by Hansom (1983), a better definition is that it is a species that is not being put to best advantage (although many commercial species are not being

put to best advantage either). The list of usable species has lengthened to some extent because of advances in technology and promotion and because of a growing scarcity of the more desired species. There has been considerable discussion about the fuller utilization of tropical forests with particular reference to the LKS, but the problem has remained intractable and little has been done (Freezaillah, 1990). Eddowes (1990), in discussing the technical aspects of promoting the LKS in Papua New Guinea, identified inadequate data on physical and mechanical properties as one of the main problems in promoting the LKS. Another factor that contributes to the promotion of LKS and lesser used species is the capacity of sawmills or carpentry workshops to process these species.

It is important to stress that the term lesser-known timber species does not connote inferiority; many lesser-known timber species have as yet not been characterized and may as well be comparable to the commercial species (Jayanetti, 1998). The definition of LKS is dynamic and the status of a species may change with time.

According to Oteng-Amoako (2006), the availability of LKS in the forest varies, usually from frequent to sparse, and data on their technological properties are limited. The LKS are mostly lower-risk species which can be exploited under normal forest harvesting practice. To avoid the overexploitation of commercially known species the use of lesser known ones is inevitable. The use of lesser used species for construction therefore require an assessment of the state of the sawmill industries and their readiness to process these species. The Timber Industry Development Division (TIDD) of the Forestry Commission of Ghana has norms and regulations for sawmill operation (TIDD, 1998). An important regulation is to have the necessary machinery before one can apply for a permit to operate a sawmill. Moreover, sawmills can either apply for a working area to

obtain the logs from, buy from loggers or do both. Smaller mills produce timber for the local market but sawmills which produce largely for export are required to produce 20% for the local market and are expected to submit documents to prove this.

The objective of the study was therefore to assess the capacity of the sawmills and carpentry workshops in terms of their machinery to process lesser used timber species for efficient utilization.

## MATERIALS AND METHODS

The study was conducted in the Kumasi (6° 54'N 1°35'E) metropolis which has a proportionately large number of timber processing firms in Ghana. The sawmills in Kumasi which are largely into the export of wood products were sampled for the study. Twelve sawmills in Kumasi were sampled out of which four had closed down due to operational difficulties. Eight of the Sawmills responded to the questionnaire administered and also granted interviews. The Sawmills include Kumi and Company Limited, Modern Wood Technology Limited, Naja David Veneer and Plywood Limited, Logs and Lumber Limited, Sunstex Company Limited, Logwood Industries Limited, AG Timber Limited and Ridge Timber Company Limited. Most of them produce lumber and other wood products mainly for export. Several carpentry shops and carpenters were visited in Kumasi to ascertain their capacity in working with the lesser used species. Forty-five (45) carpenters were sampled for the study. A multiple research approach involving the administration of structured questionnaire and semi-structured interviews was used in the study. A qualitative analysis was adopted for the research and the results presented in tables and graphs.

## RESULTS AND DISCUSSION

### Capacity of Sawmills

The responses of the eight sawmills on the type of machinery used in processing of wood are presented in Table 1. Table 1 shows that all the 8 sawmills have the various cutting and processing machinery such as band mills, cross cut saws, edgers, planners, moulders etc. Three of the sawmills which represent 37.5% have log transporting machines such as cranes, lifts, and forklifts. Only two (25%) of the sawmills have kiln dryers. The others without kiln dryers season their wood at the sawmills with kiln dryers at a fee otherwise, they do only air drying. The lack of kiln dryers in most of the sawmills affect their production capacity since they have to wait for longer periods to air-dry or pay huge sums for kiln-drying their wood in other sawmills before delivery to clients. Seventy-five percent (75%) of the sawmills have used their machinery for over 10 years and 25% of them had used their machinery between 5 and 10 years (Figure 1).

None of the sawmills visited had a processing machine purchased within the last five years. The sawmills also indicated that most of their machines were purchased brand new. Five of the sawmills (62.5%) indicated that their machines hardly breakdown (yearly or over) and only one

(1) sawmill indicated that their machines breakdown very often (daily or weekly) causing delays in meeting contract deadlines (Table 2).

Although most of the machines are old, they hardly breakdown. This may be the reason why most of the machines had been in use for over 10 years without replacement (Figure 1). Also about 87.5 % of the sawmills indicated that spare parts for repairs and maintenance of their machinery are available locally. All the sawmills also mentioned that they have a maintenance department which are constantly checking on the machines. All the eight sawmills (100%) responded that they produce lumber for the local market. They gave reasons as indicated above (Table 3). Five (62.5%) of them said they produce for the local market because it is a regulation from the Timber Industry Development Division of the Forestry Commission of Ghana. Twenty-five percent (25%) said they process for the local market because it is easy and inexpensive to deliver products to the local market compared to the export market. One sawmill indicated that the local market is a readily available market even if there are no foreign contracts. The results above indicate that the sawmills are sending lumber to the local market because it is a regulation by the Government (TIDD).

Table 1: Type of machinery used by Sawmills

Machinery	No. of sawmills	Percentage
Cutting/processing machines	8	100
Kiln Dryer	2	25
Log transporting machines	3	37.5

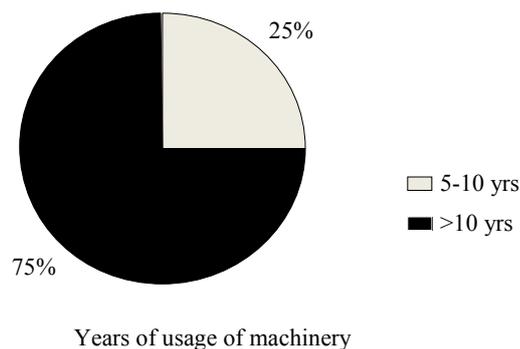


Figure 1: Chart showing years of usage of sawmills' machinery

Table 2: Rate of Breakdown of Machinery

Breakdown of Machines	Frequency	Percent (%)
Very often (daily/weekly)	1	12.5
often (monthly)	1	12.5
Not often (3-6 months)	1	12.5
Hardly (yearly or more)	5	62.5
Total	8	100

Table 3: Reasons for processing of lumber for local market

Reasons	Frequency	Percentage (%)
Easy transport	0	0
Inexpensive handling	2	25
TIDD regulation	5	62.5
Ready market	1	12.5
Total	8	100

Table 4: Reasons for Processing of lumber for export

Reasons	Frequency	Percentage out of 8 (%)
Foreign exchange	5	62.5
Profit	1	12.5
Expensive for local market	3	37.5
Local market unavailable	3	37.5

All the sawmills (100%) again indicated that they produce lumber for export. Five of the sawmills (62.5%) produce for the export market because of the foreign exchange and 37.5% of the sawmills said their products have low patronage in the local market. The local market is also not ready to pay for the high cost of production so the sawmills export for foreign exchange in order to make profit. All the sawmills (100%) indicated that they produce 50mm x 50mm and 50mm x 100mm sizes of lumber for the local market. Only one company (12.5%) produce 100mm x 150mm lumber size for the local market and none of the firms currently produce 150mm x 150mm and 150mm x 200mm lumber sizes for structural purposes on the local market. The sawmills attributed this to the demand of the local market. There is no demand for structural size lumber such as 100mm x 150mm, 150mm x 150mm and 150mm x 200mm so the sawmills do not produce them. Most of the sawmills (70%) were processing species such as Dahoma, Emire, Esia etc. which were lesser used species and now being used as replacement for the premium species such as *Milicia excelsa* (Odum)

and *Khaya ivorensis* (Mahogany) which are being overexploited.

### Capacity of Carpentry Workshops

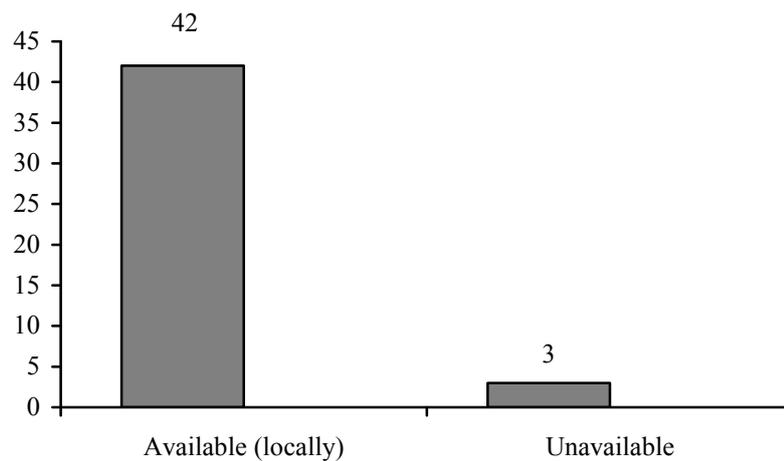
Sixty percent (60%) of the carpenters use simple hand tools such as hammers, chisels, spirit levels, planes etc. in their workshops while 40% of the respondents indicated that they use both simple hand tools and machines such as planners, cross cut saws, table saws, circular saws etc. This means that carpenters are more familiar with the use of simple hand tools than the use of machines and also their inability to afford some machines. Twenty-three (51%) of the respondents indicated that their machines do not breakdown often. They usually repair them every 3 – 6 months. Thirteen (13) carpenters (29%) indicated that their machines breakdown often. They repair or replace some hand tools monthly. However, 20% said they hardly repair machines or replace tools. They do such yearly.

Table 5: Types of tools and equipment used by carpenters

Type of Equipment	Frequency	Percent (%)
Simple hand tools	27	60
Hand tools & Machines	18	40
Total	45	100

Table 6: Rate of repairs of machines

Repairs and Replacement	Frequency	Percent (%)
often (monthly)	13	29
Not often (every 3-6 months)	23	51
Hardly (yearly or more)	9	20
Total	45	100



Availability of spare parts for repairs

Figure 2: Chart showing the availability of spare parts for the repair of machinery

Table 7: Reasons for using sawmill lumber

Reasons If Yes	Frequency	Percentage
Guarantee of wood quality and grade	4	44.4
Wood is easy to work with		0
Client's preference	2	22.3
Others sources are Illegal	3	33.3
Proximity to Sawmill		0
Total	9	100

Table 8: Reasons for not using sawmill lumber

Reasons If No	Frequency	Percentage
Too expensive	29	80.6
Sawmills are far	2	5.6
Bureaucracy and security checks	4	11
Difficulty in transport	1	2.8
Total	36	100

Forty-two carpenters (93%) indicated that spare parts for the repairs of machinery are available on the local market whilst 3 carpenters 7% indicated the unavailability of spare parts for the repair of their machinery. All the carpenters also said that they do not have maintenance departments in their workshops but usually employ the services of engineers at Suame Magazine, Kumasi when breakdowns occur.

Eighty percent (80%) of the carpenters do not obtain their wood from sawmill whilst nine (20%) of them obtain their wood from sawmill. Out of the nine (9) respondents who obtain their lumber from sawmill, 44% choose to buy the sawmill wood because of the guarantee of the wood grade and quality. This gives them good finish and so they are able to sell their products at higher prices. About 33% said it is illegal to obtain lumber from other sources such as chain saw operators and 22% obtain their wood from sawmill because some of their clients prefer sawmill wood (Table 7). The clients insist that they use only wood from sawmill and such clients are prepared to pay for higher cost.

Twenty-nine (80.6%) out of the 36 respondents who do not obtain their wood from the Sawmills indicated that wood from sawmills are too expensive (Table 8). Eleven percent (11%) of the respondents do not buy wood from sawmills because of the bureaucracies at the sawmill and the several security checks. Before one obtain wood from a sawmill, you will have to place an order and make an advanced payment and provide proof of registration of your firm. The procedure is cumbersome and discourages carpenters from buying wood from sawmills.

Ninety-one percent (91%) of the carpenters indicated their readiness to work on any available tree species including lesser used timber species. Only 4 out of the 45 respondents said that they were not ready to work with other Lesser Used

Species because their products with specific primary species of wood.

Fifty-three percent (53%) of the carpenters have had no education while 47% of the carpenters indicated that they have had education of some sort. Eighteen (85.7%) of the educated carpenters had education up to the Junior High School Level. Two (2) carpenters had education up to Senior High School Level. None of the respondents have had education up to the tertiary level.

## CONCLUSIONS AND RECOMMENDATIONS

The sawmills in the Kumasi Metropolis have the needed machinery to process lesser used species for both export and local markets. They indicated their readiness to process for the local construction industry if the local customers are ready to pay for the cost of lumber from the sawmills. Sixty two point five (62.5%) of the sawmills said that they produce lumber for the local market only because it is regulation from the TIDD.

Most of the sawmills (70%) were processing species such as Dahoma, Emire, Esia etc. which were lesser used and now being used as replacement for the premium species such as *Milicia excelsa* (Odum) and *Khaya ivorensis* (Mahogany) which are being overexploited. They however expressed difficulty in sawing or processing the lesser used species. Specific challenges include the blunting of saw blades and cutters. This increases the frequency with which saw blades and cutters are replaced.

Advanced technology and techniques in processing which are cost effective therefore needs to be developed for the processing of these species for efficient utilization in order to reduce the overexploitation of the commercial (traditional) timber species.

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