# Consumption and production pattern of sawmills in Ratnagiri district of Maharashtra state

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## ABSTRACT

Sawmill is one of the principal forest industries that is engaged in the processing and the efficient utilization of the timbers, a producer of semi-finished intermediate goods for other sectors. The study was aimed at consumption and production pattern of sawmills in Ratnagiri district of Maharashtra state. Data were collected from thirty six (36) sawmill firms from the study area primarily through questionnaire using the random sampling technique. The results revealed that the overall lumber recovery in the selected sawmills was estimated at 73.96 per cent of the total lumber input. The average recovery of sawmills was between 63.55 to 83.95 per cent. In the sawmills of 6 species which had larger consumption, *Gmelina arborea* (80.73%) reported the highest recovery followed by *Tectona grandis* (79.34%), *Terminalia tomentosa* (78.12%), *Acacia arabica* (74.37%) and *Mangifera indica* (73.66%) and lowest was in *Artocarpus interifolius* (71.20%).

**Keywords:** Sawmills; recovery; tree species; production; consumption

## INTRODUCTION

Man and forest have been having a close relationship since time immemorial (Parameswara 2010). Forest is a dynamic natural resource that can be sustainably harvested and managed to yield a diversity of commodities of economic importance (Anon 2020). Forest is the second largest land use in India next only to agriculture (Anon 2019). With the growth of civilization and development of agriculture, forests continue to be a rich source of raw materials to many industries and provide livelihood to a large number of forest communities (Parameswara 2010). The total forest area of Ratnagiri district is 7,001.67 hectares. The district has an area of 8,208 sq km out of which the reserve forest area is 48.91 per cent, the protected forest area is 0.03 per cent and the classified forest area is 23. 88 per cent (https://ratnagiri.gov.in/geographical-information/).

Forests play an important role in providing several goods which serve as raw materials for many industries along with a numerous services such as environmental and ecological stability necessary for human sustenance (Hanumantharaya 1998). Sawmill is one of the principal forest industries that is engaged in the processing and the efficient utilization of the timbers and a producer of semi-finished intermediate goods for other sectors (Asibong 2011). Sawmills can be categorised according to size, machinery and raw materials requirements (Caldera and Amarasekera 2014). Various machines used for conversion include vertical saw, circular saw, frame saw and horizontal saw for processing cants and flitches into specified and marketable dimensions (Faruwa and Ekwugha 2017).

Increasing population gave rise to the establishment of some wood-based industries like saw milling, furniture and plywood industries. In the Maharashtra state, total 4,191 sawmills are registered with license of which 4,216 sawmills are presently operating in the state (Anon 2017). In Ratnagiri district, total of 186 license holder sawmillsowners are successfully running their business. Majority of timber in this region is produced in private land and is easily

available and preferred in sawmills industry. An understanding of the present status of characteristics, production and consumption of sawmills in Maharashtra is requisite. Therefore present investigations were focused on characteristics, consumption and production pattern of sawmills in Ratnagiri district of Maharashtra state.

## METHODOLOGY

Present study was carried out in all 9 Talukas of Ratnagiri district of Maharashtra state. A total 186 license holder sawmills were operating in the district. Out of these total 4 registered sawmills were selected from each Taluka by random sampling method. Thus the sample size was restricted to 36. The data were collected with the help of specially designed questionnaire through personal interview and discussion with the sawmill owners during February-March 2021. Prior to survey, a questionnaire was designed based on previous studies and pre-tested with four sawmill owners to find out its suitability for the present study and modified according to the response of the informants. The first section of questionnaire was aimed at capturing the

general information of the sawmill owners; the second part was focused on characteristics of sawmills and third part included information of consumption and production pattern of sawmills.

## RESULTS and DISCUSSION

**Consumption, production and wastage of timber**

It was found that overall average consumption, production and wastage were 508.80, 376.33 and 132.47 m³ respectively. Overall lumber recovery in the selected sawmills was estimated as 73.96 per cent of the total lumber input (Table 1) and was in between 63.55 (Lanja Taluka) to 83.95 per cent (Dapoli Taluka). This could be as a result of size of logs, the machine type, availability of skilled and experienced employees, demand-driven market, fuel scarcity, declining wood quality, limited storage facilities etc. Similar observations were made by Izekor et al (2016); less than the findings of Aghimien et al (2020) and more than the study of Faruwa and Ekwugha (2017), Olufemi et al (2012), Egbewole et al (2011), Ofoegbu et al (2014) and Omoniyi and Fatoki (2013). Positive correction was found among consumption, production and wastage of timber (Table 2).
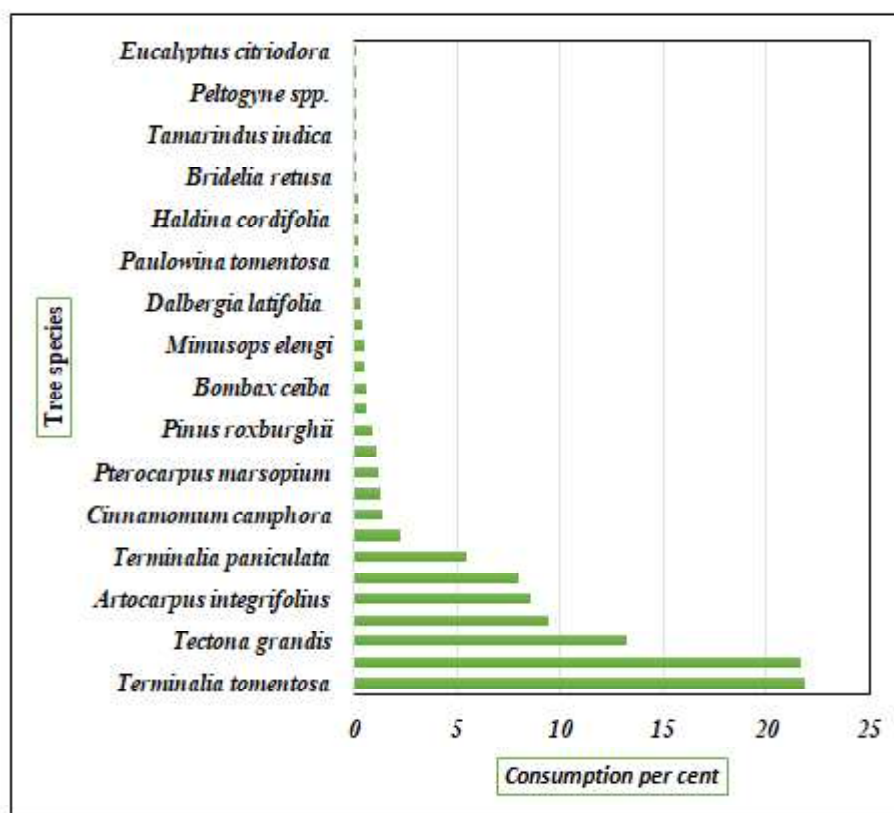


**Fig 1. Species-wise consumption of timber (%) in sawmills of Ratnagiri district, Maharashtra**

Table 1. Consumption, production and wastage of timber in the studied sawmills of Ratnagiri district, Maharashtra

| Taluka | Volume of lumber (m³) | Volume sawn timber (m³) | Volume of timber wastage (m³) | Per cent recovery |
|---|---|---|---|---|
| Dapoli | 734.40 | 616.50 | 117.90 | 83.95 |
| Khed | 630.00 | 475.50 | 154.50 | 75.48 |
| Chiplun | 669.60 | 429.54 | 240.07 | 64.15 |
| Ratnagiri | 506.40 | 369.98 | 136.42 | 73.06 |
| Lanja | 387.00 | 245.95 | 141.05 | 63.55 |
| Sangmeshwar | 537.60 | 390.21 | 147.39 | 72.58 |
| Rajapur | 399.00 | 319.20 | 79.80 | 80.00 |
| Guhagar | 345.60 | 257.04 | 88.56 | 74.38 |
| Mandangad | 369.60 | 283.03 | 86.57 | 76.58 |
| Average | 508.80 | 376.33 | 132.47 | 73.96 |
| SE | 173.92 | 136.82 | 74.74 | |
| $CD_{0.05}$ | NS | NS | NS | |
| CV | 68.36 | 72.71 | 72.07 | |

NS= Non-significant

Table 2. Correlation analysis among consumption, production and wastage of timber in sawmills of Ratnagiri district, Maharashtra

| Component | Volume of lumber | Volume of sawn timber | Volume of timber wastage |
|---|---|---|---|
| Volume of lumber | 1 | | |
| Volume of sawn timber | 0.95* | 1 | |
| Volume of timber wastage | 0.63* | 0.34* | 1 |

*Statistically significant 5% LoS

## Utilization of tree species

Total 31 species were reported to be commercially utilized in sawmills in Ratnagiri district (Fig 1). Though many timber species were available in the district, only few species were preferred for sawing purpose. *Terminalia tomentosa* (21.85%), *Mangifera indica* (21.67%), *Tectona grandis* (13.20%), *Gmelina arborea* (9.42%), *Artocarpus integrifolius* (8.55%) and *Acacia arabica* (8.01%) were favoured for sawing in the area which contributed 82.70 per cent of the total utilized volume of lumber. Boampong et al (2015) stated that consumer preference, appearance, process ability, durability, type of product, area of usage and availability of species influenced the choice and utilisation of species.

## Recovery of highest consumption species

Data revealed that only 6 species had larger consumptions (82.70%) in sawmills. Results (Table 3) show that *G arborea* (80.73%) had the highest recovery followed by *T grandis* (79.34%), *T tomentosa* (78.12%), *A arabica* (74.37%), *M indica* (73.66%) and lowest was in *A integrifolius* (71.20%). These were the mostly consumed wood species in all the sawmills under study. Omoniyi and Fatoki (2013) stated that recovery of lumber is jointly affected by the species of wood available in forests and the demand for a particular wood species for manufacture of various wood-based products by wood users.

## CONCLUSION

The overall average consumption, production and wastage in the studied area were 508.80, 376.33 and 132.47 m³ respectively. Recovery of timber species depends on kind of logs, machine type used for sawing as well as the skills and techniques used by the sawyers. There is a need of effective utilization of the unavoidable wood residues generated as wastes (both sawdust and firewood) to produce other valuable products. Area under plantation is needed to be increased for highly demanded species for sustainable management of natural resources in the study area.

Table 3. Recovery of highest consumption species in sawmills of Ratnagiri district, Maharashtra

| Species | Volume of tree species (m³) | Volume of sawn timber (m³) | Volume of timber wastage (m³) | Per cent recovery |
|---|---|---|---|---|
| *Terminalia tomentosa* | 176.60 | 137.96 | 38.64 | 78.12 |
| *Mangifera indica* | 175.20 | 129.05 | 46.15 | 73.66 |
| *Tectona grandis* | 106.73 | 84.68 | 22.05 | 79.34 |
| *Gmelina arborea* | 76.13 | 61.46 | 14.67 | 80.73 |
| *Artocarpus interifolius* | 69.13 | 49.22 | 19.91 | 71.20 |
| *Acacia arabica* | 64.72 | 48.13 | 16.59 | 74.37 |

## REFERENCES

Aghimien EV, Akinkuoroye OH and Adams OT 2020. Assessment of wood waste generated in selected sawmills in Kajola local government area of Oyo state. Journal of Research in Forestry, Wildlife and Environment **12(2):** 263-269.

Anonymous 2017. 25 new saw mills sanctioned in Maharashtra in violation of court order. BusinessLine, The Hindu, Nagpur, Maharashtra, India, 6 May 2017,

Anonymous 2019. State of forest report 2019. Forest Survey of India, Ministry of Environment, Forest and Climate Change, Dehradun, Uttarakhand, India.

Anonymous 2020. Global forest resources assessment 2020 (FRA 2020). Food and Agriculture Organization of the United Nations, Rome, Italy.

Asibong ES 2011. Comparative study of activities of sawmilling industry on the environment of two selected locations within southern Nigeria. MSc Thesis, Michael Okpara University of Agriculture, Umudike, Abia State, Nigeria.

Boampong E, Effah B, Antwi K, Asamoah JN and Asante AB 2015. Factors influencing the choice of timber for furniture and joinery production in Ghana. European Journal of Engineering and Technology **3(5):** 48-59.

Caldera HTS and Amarasekera HS 2014. Investigation of sawmill management and technology on waste reduction at selected sawmills in Moratuwa, Sri Lanka. Journal of Tropical Forestry and Environment **5(1):** 71-82.

Egbewole ZT, Ogunsanwo OY and Omole AO 2011. Technical efficiency of lumber recovery from high forest tree species in selected sawmills of southwestern Nigeria. Nigerian Journal of Agriculture, Food and Environment **7(1):** 34-41.

Faruwa FA and Ekwugha UE 2017. Operational efficiency of selected sawmills in Akure metropolis, Ondo state. Journal of Sustainable Environmental Management **9:** 67-83.

Hanumantharaya T 1998. Development of forest-based industries in Karnataka. MPhil Dissertation, Sri Krishnadevaraya University, Anantapur, Andhra Pradesh, India.

https://ratnagiri.gov.in/geographical-information/ (Retrieved: 14.01.2022)

Izekor DN, Amiandamhen SO and Awenagbiku EO 2016. Effect of taper and sawing methods on log conversion among selected sawmills in Egor and Ovia northeast local government area, Edo state, Nigeria. Nigerian Journal of Forestry **46(1):** 1-5.

Ofoegbu C, Ogbonnaya S and Babalola FD 2014. Sawmill conversion efficiency and wood recovery of timber species in cross river state Nigeria. Agriculture and Forestry **60(1):** 105-113.

Olufemi B, Akindeni JO and Olaniran SO 2012. Lumber recovery efficiency among selected sawmills in Akure. Drvna Industrija **63(1):** 15-18.

Omoniyi TE and Fatoki JG 2013. Lumber recovery efficiency of some selected sawmills in Ibadan metropolis, Oyo state, Nigeria. Proceedings, Forestry Association of Nigeria (FAN) Conference on Forest Industry in a Dynamic Global Environment 2013, Sokoto, Sokoto State, Nigeria Sub-theme **2(1):** 393-400.

Parameswara BM 2010. Production and consumption of selected timbers in Karnataka- an economic study. Department of Agricultural Economics, University of Agricultural Sciences, GKVK, Bangalore, Karnataka, India, 95p.