

Evaluation of Outturn of Mechanized Round Incense sticks in different Bamboo species of India

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Rationale

- ❖ Incense or agarbatti stick is a globally traded product and used in almost every household worldwide.
- ❖ The *agarbatti* industry plays a significant role in the rural economy of India through employment generation opportunities to the rural women.
- ❖ Bamboo is the only raw material used as incense stick.
- ❖ Lack of sufficient study and literature about the proper selection of species for production of mechanized agarbatti sticks is the major constraint surrounding the agarbatti industry.

Objective

- To determine the choice of Species and appropriate raw material type for production of mechanized incense sticks.

Materials and Methods

Study area

- ❖ The study was carried out during Sept. to Dec., 2020 in the state of Tripura, India, which lies between 22°56' and 24°32' N latitude and 91°09' and 92°22' E longitude with an altitude of 12.8 m amsl surrounded by Bangladesh in North, South and West and, two Indian states (Assam and Mizoram) to the East. The state has a bamboo area of 3783 Km² out of total forest cover of 7726 km² (FSI, 2019).

Study Material

- ❖ Based on availability of bamboo culms, minimum intermodal length, wall thickness and diameter/girth of culms, seven species viz. *Bambusa polymorpha*, *B. vulgaris*, *B. cacharensis*, *M. baccifera*, *B. tulda*, *Dendrocalamus asper* and *D. longispathus* were selected out of the 19 species available (Gupta 2008) in Tripura, India.

Bamboo harvesting and Extraction:

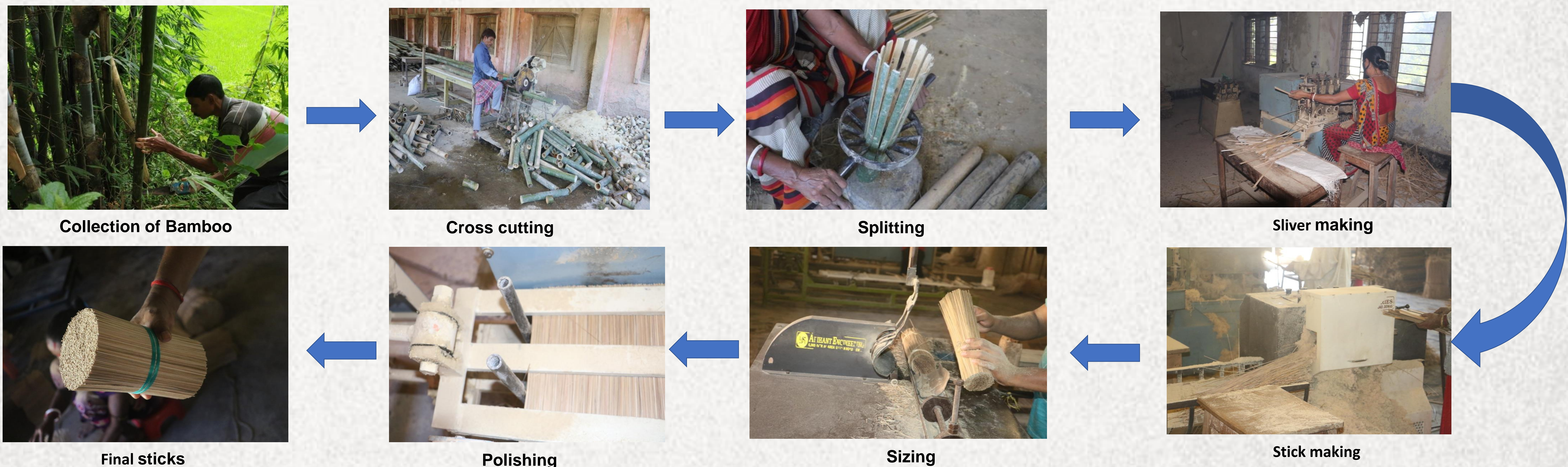
- Four year old bamboo culms were selected and harvested as they become mature in three to four years (Banik, 2015) then gradually grow old and weak and die in ten years or so (Ueda and Numata, 1961). The culms selected were felled manually using a felling saw as close to the ground level as possible.

Seasoning

- Most of the bamboo species has a moisture content of more than 30%. So all the culms harvested were subjected to seasoning before they are considered fit for stick making. The harvested culms were kept in a vertical slanting position under shade for a period of 20 days so as to bring the moisture level to as minimum as possible (15-20%) for better workability.

Process of Incense Stick Making:

- The mechanical production of incense sticks were carried out at M/s Pioneer Industries Pvt. Ltd., Bhodjungnagar Industrial Estate, Tripura, India as follows:



Data Collection and analysis

- ❖ The data pertaining to the outturn of the mechanized industrial production of incense sticks from the culms of different species were collected after cross cutting of culms into pipes, slivers, round sticks and finished incense sticks. The data collected were analysed using MS-Excel.

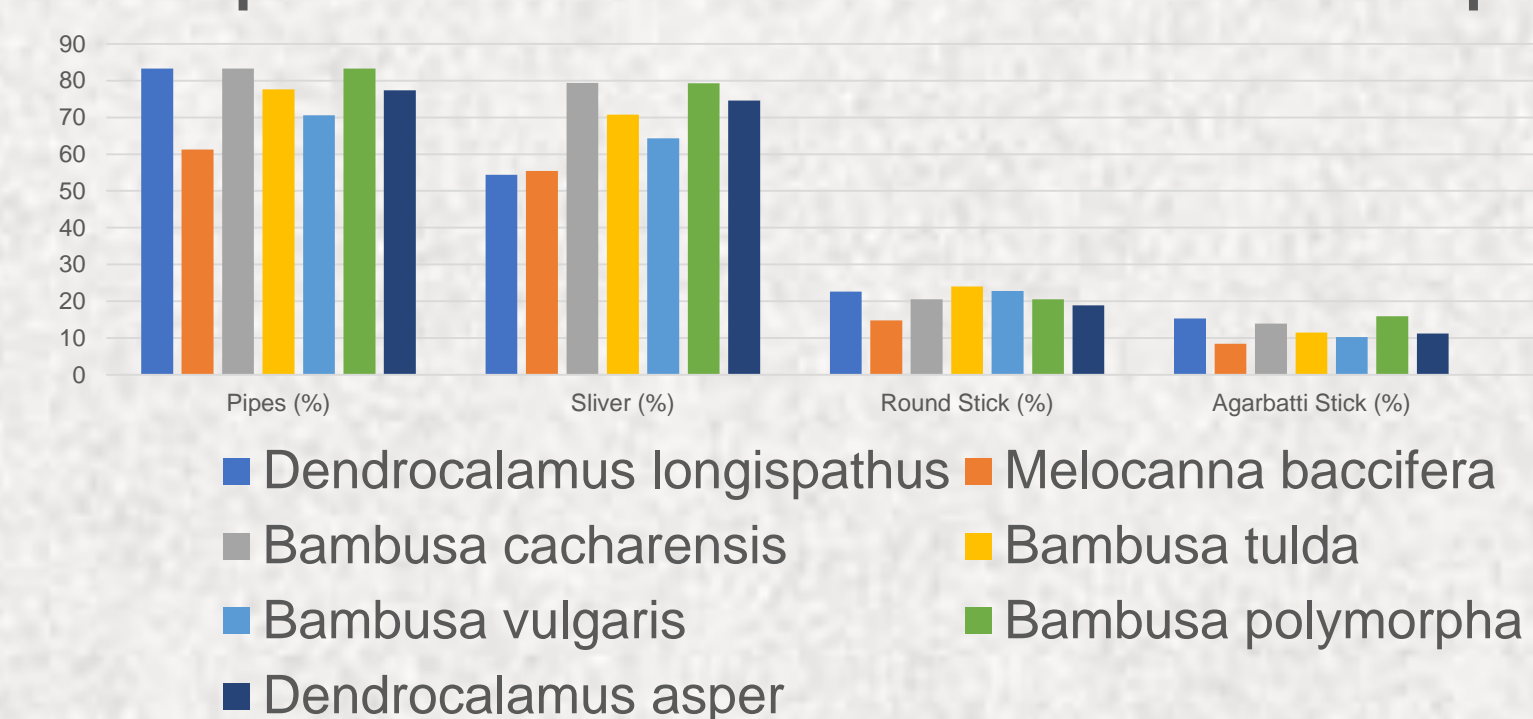
Result

The outturn data (Table) shows that although three species viz. *D. longispathus*, *B. cacharensis* and *B. polymorpha* recorded their maximum pipe production but only the latter two species produced maximum sliver percent. It is also seen that round stick percent was maximum for *B. tulda* followed by *B. vulgaris* and *D. longispathus* without having any relation to the maximum percent of pipes and sliver. Maximum outturn of agarbatti stick per cent was maximum for *B. polymorpha* followed by *D. longispathus*.

Table: Outturn on different stages in industrial production of Incense stick of bamboo species

Bamboo Species	Outturn at different stages			
	Pipes (%)	Sliver (%)	Round Stick (%)	Agarbatti Stick (%)
<i>Dendrocalamus longispathus</i>	83.28	54.43	22.66	15.38
<i>Melocanna baccifera</i>	61.24	55.43	14.84	8.47
<i>Bambusa cacharensis</i>	83.28	79.38	20.59	13.98
<i>Bambusa tulda</i>	77.65	70.71	24.02	11.54
<i>Bambusa vulgaris</i>	70.55	64.29	22.85	10.27
<i>Bambusa polymorpha</i>	83.28	79.27	20.59	15.94
<i>Dendrocalamus asper</i>	77.31	74.57	18.92	11.21

Outturn data on different stages in industrial production of Incense stick of bamboo species



Conclusion

The outturn from agarbatti stick production is an important factor to decide on the profitability of the industries and bamboo growers. Although at present *B. tulda* is the only Indian species which is in high demand by the industries because of its quality of produce and marketability, this study is an eye-opener to illustrate that the species like *B. polymorpha*; *D. longispathus* and *B. cacharensis* can contribute more returns for the agarbatti industries & growers if they are used commercially for stick production. More studies on their properties are required to ascertain if these alternative species can meet the quality of the finished product as per the demand of the industries.

References

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