

A Plea For Bamboo

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"It is well known that bamboo largely replaces softwood as the long fibre ingredient in pulp manufacture in India. Mix of hardwood pulp with bamboo pulp is now an accepted practice and contribution upto 50% of selected hardwoods had been successful (1). The present average hardwood pulp contribution is around 24%. The projected low estimate (2) is 45.4% in 1980, 46.0% in 1985 and 49.4% in 2000 A.D. while that of softwood which is around 3% now will increase to 24.3%. Since the consumption pattern estimate for paper and paper boards (excluding newsprint) has been put at 3.2 million tonnes against the present day 0.9—1.0 million tonnes, softwood availability has to be increased by a phenomenal margin. The aggregate softwood requirement for pulp and paper alone will be 3.1 million tonnes (5.9 million as high estimate) against the average present day production of 0.7 million tonnes for all categories of users. The increase in supply is sought to be achieved through 20,000 ha. of annual plantation of tropical pine and concentrated natural regeneration of 30,000 ha. of Himalayan conifers. These targetted figures will be additional to 1,60,000 ha. of hardwood plantation and 4,00,000 ha. of natural regeneration of hardwood forests. The planning is highly optimistic and if achieved, will be commendable. It is, however, necessary to be on guard against failures and hence some re-thinking on bamboo as the long fibre raw material is called for."

Introduction

The requirement of bamboo for fibre for the paper industry on

the basis of its low percentage of mix as earlier indicated has been calculated in N. A. C. Report (2) as follows:—

	High Estimate			(⁰⁰⁰ tons)	Low Estimate		
	1980	1985	2000		1980	1985	2000
Bamboo	2,165	3,123	3,546		1,907	2,352	1,936

It will be seen that bamboo requirement will be actually less according to the low estimate in 2000 A.D. Basing on these figures and on the assumption that the softwood pulp will replace bamboo, no specific attention has been directed at the improvement of the bamboo forests. On the other hand, some points enumerated below, have been mentioned about its difficulties (2).

(i) The bamboo has less growth rate than tropical pines.

(ii) Natural bamboo forests can not be worked for bamboo only, as it will lead to low productivity.

(iii) The cost of artificial regeneration of bamboo is high.

(iv) Concentrated bamboo plantation has not been much of a success silviculturally.

It is felt that arguments are not at all convincing and are commented upon serially below.

Rate of growth of bamboo and tropical pines :

The average rate of growth of tropical pine plantations is expected to be at least 3-4 times that of bamboo. But in all fairness the rate of bamboo growth in natural forest should be compared to those of naturally growing pines of indigenous species. F.A.O. Report (1) indicates an average yield of bamboo of 5 tonnes / ha / year which is rather a high figure. It is generally in the region of 2.5 tonnes/ha/year for *Dendrocalamus hamiltonii* in Arunachal Pradesh (3). As against this, the Chir pine—Blue Pine—Deodar Fir of Chenab Valley in (J & K) vary between 1.54 to 3.01 (4).

The problem is that hardly any work of computation of increment in natural or plantation of bamboo has been systematically done so far, and therefore,

rejection of bamboo on the basis of low increment is too hasty.

Working of bamboo alone in forest will lead to productivity.

This is agreed to. But why, in a mixed forest only bamboo will be worked and not other species is not understood. The entire concept for a forest to be utilised for one product is wrong from the ecological point of view. Maintenance of the eco-type and various synusiae in substantial areas is now appreciated a large number of foresters and therefore, maintenance of the bamboo mixed forest is desirable.

Cost of artificial regeneration of bamboo.

Artificial regeneration of bamboos with offset planting is expensive but not so when grown from seedlings. As a matter of fact, it is less costly as the planting distances will be more than that of say *Eucalyptus* hybrid. The seeds of some species like *Dendrocalamus strictus*, *Bambusa—Pallida*, *Bambusa arundinacea* are available and growing them is not at all an expensive operation. Furthermore, little systematic research has been done but indications are that branch planting, culm planting, etc. are possible.

4. Lack of success in bamboo plantations.

This is a general statement and my experience is totally different. Raising of bamboo plantation is quite easy provided adequate attention and protection are given.

The fact of the matter is that bamboos, an unique indigenous long fibre product of India and South East Asia has been given very little attention from the silvicultural point of view. The total area to-day under bamboo is 10 million ha. and we should not neglect this huge area and this unique species in favour of tropical softwoods for which little research has been done so far and the inherent dangers of introduction of an exotic hastily on a large scale exists.

Pulping qualities of softwoods and bamboos

I am setting below the fibre length of the oft-used softwoods and bamboos.

Species	Local name	Length of fibre (mm)	Cellulose (content (%))
<i>Picea abies</i>	Norway spruce	3.5	43
<i>Picea Sitchensis</i>	Sitka Spruce	5.5	—
<i>Pinus bauksiana</i>	Jack Pine	3.5	41
<i>P. elliotii</i>	Slash Pine	3.5	—
<i>P. Sylvestris</i>	Scot Pine	3.0	—
<i>Dendrocalamus hamiltonii</i>	Kako	6.75-1.5 (Av.3.5)	63.3
<i>D. Strictus</i>	Salia	5.5-1.0 (Av. 3.6)	60.8
<i>Bambusa arundinacca</i>	Daba	4.75-1.0 (Av. 2.72)	62.3

It would be seen from the above table that the average bamboo fibre length is more or less similar to that of softwoods. However, bamboo has variable fibre length while those of softwoods are uniform. Secondly, the length alone is not the only criterion for strength. It is also accepted that bamboo does not yield paper of the strength characteristic of the coniferous

trees. On the other hand, the cellulosic content is invariably higher to that of conifer, is as expected because of the latter's high lignin content. Further, the bamboos, being made of short and long fibre, can be used successfully for various paper grades.

Conclusion

The conclusion from the above discussions can be written down serially.

1. That the planning for reduction of bamboo contribution to the paper pulp by 2000 A.D. to as low as 14.8% for the present 51% is over optimistic and safeguard with attention to bamboo forests is desirable.

2. The reasons aduced for lack of attention to bamboos is not justifiable. The forest research workers should focus more and more attention to this species because of its certain inherent characteristic like mixture of short and long fibres and high indigenous availability.

3. The proper management of bamboo forests will not need the

high investment necessary to change over to softwood plantation.

4. Systematic research work on various aspect of bamboo including introduction of exotic, cloning of high pulp yielding individuals are necessary.

It may be worthwhile to mention here that out of large number of research schemes that have been recently introduced under the auspices of Ministry of Agriculture, none relates to bamboos. It is proposed that immediate rectification of this omission be made. In case it is not accept-

able the forest departments can lease some land from the forests holdings for research and growing of bamboos to the papermills. The latter, being highly interested in sustained supply of bamboos, will not be failing to improve the present status of bamboo in Indian Forestry.

References

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