

# Problem of Gregarious Flowering of Bamboos and Steps to Counter it

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It is a well-known phenomenon that the bamboos have their own life cycle, they flower at almost regular intervals and die off. The flowerings of the past, recorded in

India are scattered and varied; we shall, however, restrict ourselves to the flowerings in our area which have been recorded as under:

| Year    | Spp.                   | Forest Dn.   | Areas                            | Type       |
|---------|------------------------|--------------|----------------------------------|------------|
| 1863-69 | Bambusa arundinacea    | North Kanara | Virnoli, Kulgi Sambrani, Dandeli | Gregarious |
| 1916-23 | -do-                   | -do-         | -do-                             | -do-       |
| 1959-63 | -do-                   | -do-         | -do-                             | -do-       |
| 1884-92 | Dendrocalamus Strictus | -do-         | -do-                             | Sporadic   |
| 1918-26 | -do-                   | -do-         | -do-                             | -do-       |
| 1947-56 | -do-                   | -do-         | -do-                             | -do-       |

In most of the forests of our country, Bamboo is the only raw material with the longest fibre and excepting one or two all the Paper Mills in our country are entirely dependent on bamboos as their raw material. May be that some use had wood-pulp but entirely depending on hard-wood pulp means affecting the quality of the final

produce. Nobody can deny that the longer the fibre of the raw material, the superior is the final product. 97% of the existing Paper Mills in India are using bamboos only as their main raw material and remaining use wood pulp. The annual requirement of bamboos for these existing Mills runs into 4 million tonnes on sustained basis. Per capita consumption of paper is extremely low in India being 1.4 kg. per year compared to most undeveloped countries of U.A.R. etc. where it is 6 kg. Thus, this is an industry which has got to develop. Of course, the raw material will mainly be bamboo for the next 2—3 decades. When all these industries are entirely dependent on bamboos as their raw material, one can imagine the plight of the industries

when the gregarious flowering takes place in its entire area of raw material supply. Of course, 2—3 years period after flowering is no problem for the industry, as it can extract dead bamboos judiciously and with efficient fire-protection measures during the ensuing one or two years. The main crux of the problem arises after this period. How to tackle the problem? The industry is running in full swing and with the paucity of raw material staring in the face, one will be left with the only alternative of running about after the *Department and Government for allotment of fresh areas.* The *Department* and the *Government* may come to the rescue, only if it is possible and any of the other bamboo bearing areas are not committed to anybody else. If reverse is the case, the industries entirely dependent on limited area wherein the flowering takes place, will face the consequences of closure till the regenerated bamboo crop attains maturity and exploitable size. How to overcome these situations? Although the situation arises once in a life-time, one has to plan well in advance to counteract this situation, since forestry is always a long range policy. If one has clearcut views regarding the future plans of action, the necessary funds, enthusiastic band of workers, it is not very difficult to face this challenge thrown by Nature and definitely minimise if

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not eliminate these hazards that stare in our face.

A few suggestions towards this end have been detailed below on the basis of practical work undertaken in our concern which had to face this situation immediately after going into production.

### **I. Systematic & Silvicultural Extraction of Bamboos**

Although this system of working does not eliminate the evil of gregarious flowering, it will not only help in postponing and delaying the flowering cycle by a few years but also is found to enhance the yield during the subsequent felling cycles by about 25 to 30%. *Dendrocalamus strictus* is presumed to have a normal life cycle of about 25 to 30 years. In Punjab and Orissa there are instances that this life cycle is prolonged by a few more years by undertaking the extraction of these bamboos on systematic and silvicultural lines. In the leased out areas of the West Coast Paper Mills in Dandeli Division of North Kanara District of Mysore State, the above species flowered from 1948-1956. The regeneration was profuse and very thick and matty. With the co-operation of the Forest Department, the paper mills which was established and started production in 1958 clearfelled all the dead bamboos and utilised them. The areas were fenced in 1964 and cultural operations viz., spacing out to 10' x 10' where the natural crop was switchy and too dense was undertaken. In areas where the growth had reached almost mature size spacing of clumps was undertaken and thinning within the clump was

also done. It was noticed in 1969 that the patches where no operations were undertaken and the growth had reached almost exploitable size, the gregarious flowering did take place in one of the blocks. This clearly shows that life cycle of about 25 years is almost maintained when the crop is left to nature unattended to. In similar areas where the cultural operations were carried out, it was noticed that the signs of flowering were not only not seen but also the working gave a fillip to the rhizome activity and the number of new recruits increased per clump and consequently the yield increased from .3 tonnes per acre per year of the first cycle to .6 tonnes in the second cycle.

### **II. Staggering the life-cycle in a certain area**

This method involves expenditure over protection, artificial plantations etc. The general tendency of flowering is to spread and sweep the areas in waves and every year as the flowering progresses seed collection has to be done. These fresh seeds are sown in nurseries transplanted next year and planted out in the field as under plantings in the existing forests during the 3rd year. It is well-known fact that bamboo from the same parents flowers at the same time whenever the parent clump flowers, wherever the stocks from the parent are planted. Thus, we noticed that *Bambusa arundinacea* flowered in the concession area of West Coast Paper Mills during 1959-63. The regenerated bamboo (natural regeneration) is expected to flower again in 1999 to 2003. When this area is underplanted with

nursery raised seedlings from seeds collected from areas flowered in 1968-69 and raised for two years in nurseries, these shall be flowering during 2008—2011. Thus even if the original crop flowers during 1999 to 2003, we will have the artificial plantations to depend upon for green bamboos for about 8-10 years more till they flower during 2008-2010. This staggering will give some respite and breathing time. Further on no artificial plantings will be necessary but only protection and tending of natural seedlings of the two crops as and when they flower.

### **III. Raising of different varieties of Bamboos which have different life cycles as mixed crop in a certain locality**

*Bambusa arundinacea* is our main local species and second in importance is *Dendrocalamus strictus*. Taking into consideration the soil conditions, the rainfall and its duration, it is possible to introduce species which can grow well in these areas—may not be to the same extent as in their natural habitat—and introduce them as mixed crop by underplanting by artificial means as explained in II. Thus, we have introduced in our areas exotics like *Bambusa Balcoa*, *Dendrocalamus brandisii*, *Bambusa tulda*, *Bambusa pallida* etc. These are having different-life cycles and when the original bamboo flowers, these will be green still and can be depended upon to face the hazard of gregarious flowerings of local species.

### **IV. *Bambusa Vulgaris***

This seems to be one of the most dependable species. This is an exo-

tic and it originates from Thailand. These were grown at places as an ornamental bamboo. Necessity is the mother of invention. Efforts were made by the Research staff of West Coast Paper Mills on large-scale vegetative propagation of this variety. The efforts were met with tremendous success. The greatest advantage of this variety is that no records of its flowering is there in Thailand. Secondly, given better conditions, the bamboos grow to a good height of 18 to 20 metres with a diameter of about 10 cms. and thickness of wall up to 1.875 cms. The bamboos are not thorny and branching is not so profuse or interlocking as in the case of *Dendrocalamus strictus* or *Bambusa arundinacea* which are respitose type. Hence, it does not pose any

problem for exploitation. This was experimented upon for vegetative propagation and it was a great success in that, the shoot-cuttings (culm-cuttings) with one node from one year and two-year old culms not only sprouted within a week but started root development within a month and in about 6-8 months' time developed into a rhizome also, and was fit for transplanting in the field. After transplanting in the field just before monsoons, the survival percentage was found to be 98% and the most peculiar and encouraging thing noticed was with watering the clump goes on giving new shoots. Under irrigated conditions, it was observed that the ratio of new shoots to old was minimum of 1:1. Of course, we may not get this ratio under the field conditions,

but this variety is a very good substitute for introduction as a mixture in the forest and with its background and history, will always provide a stand by for the hazard of gregarious flowering.

As already suggested in the beginning, the most essential part is that one has to invest a fortune in this operation if one has to face and these hazards risks. This simultaneously involves the concurrence and co-operation of the Forest Departments of States. Whenever and wherever this joint venture is undertaken in close co-operation by the industries and the Forest Department, we are of the opinion that the gregarious flowering should not pose such a fantastic problem as it posed during this decade.