

## BAMBOO – A VITAL RESOURCE FOR PRUDENT UTILIZATION

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### Introduction

Bamboo is one of the fastest growing plants on the earth, growing three times faster than most *Eucalyptus* species and can be harvested four times. Bamboo gives yield upto 50 tonnes per hectare per year in managed stands. It is estimated that about one quarter of the biomass in tropical regions and one-fifth in sub-tropical regions comes from bamboo. Bamboo culms grow to more than 40 metres in three to four months in some species. Its lightness and high modulus of elasticity (9000 to 10,000 N/mm<sup>2</sup>) and ruptures (84 to 120 N/mm<sup>2</sup>) make bamboo an ideal material for housing in areas prone to natural calamities such as earthquakes and hurricanes. The annual consumption of bamboo in India is about 4.5 million MT of which about 1.5 million MT is supplied to paper mills (Singhal and Gangopadhyay, 1999). Out of this one per cent is being derived from natural forests. Bamboo is basically a household plant species around the houses and compounds on farmlands. Bamboos which are giant, woody, tree-like grasses, have a long history as a versatile and widely used resource. The strength of bamboo culms, their straightness and lightness combined with hardness, range in sizes, hollowness, long fibre and easy working qualities make them suitable for a variety of purposes.

From the tender shoots used for pickles and curries, sticks used for tooth sticks and meat barbeques, through the ribs for ubiquitous fans, the slats for sunscreens, bamboo houses; the versatility of bamboo is legendary. The multifarious uses of bamboo have long been known and established.

### Employment Generation

Bamboo is a multipurpose species and its processing is labour intensive providing opportunities for diverse employment. Bamboo forests in India provide three types of employment :

- (i) direct employment,
- (ii) self employment, and
- (iii) secondary employment based on forest industries.

Direct employment is provided in the form of managerial, technical, research, planning and executive jobs. It is estimated that one hectare of bamboo plantation with 500 clumps generates 383.9 mandays of employment for unskilled labour and 47.3 mandays for supervisory and skilled labour over a period of 30 years. It has estimated that 17 mandays will be required to harvest, extract and transport one ADMT (Air dry metric tonne) of bamboo. Cottage industry based in bamboo and paper, pulp, paper board and rayon

industries provide secondary employment to the people.

### Income generated through Bamboo harvesting in A.P.

The Andhra Pradesh Forest Development Cooperation has raised bamboo plantation over an area of 19,332 ha in the districts of Adilabad, Khammam, East and West Godavari, Kurnool, Prakasam. Sale of harvested bamboo fetches, on an average, gross revenue of Rs. 500 lakhs per annum. Every year about 12.00 lakh Long Bamboos are extracted. These are transported from the plantations to APFDC Depots where sales are held by way of conducting auctions.

### Production of Bamboo in 2000-2001 – 2001-2002

The production of bamboos in various states of India in the years 2000-01 and 2001-02 is given in Table 1.

In Rajasthan Bamboos occurs in Dry Deciduous Forests and mostly found in Udaipur, Chhittorgarh, Sirohi and Banswara Forest Divisions (Tewari, 1992). Approximately 5 million standard bamboos are extracted directly and indirectly from forests, amounting to Rs. 100 million in value. The total contribution of NTFP works out to approximately Rs. 520 millions annually. The trade statistics of bamboo in Rajasthan State in last decade are given in Table 2.

The royalty rate on bamboo in Rajasthan is Rs. 25 per m<sup>3</sup> and income from royalty is on an average Rs. 5-6 lakhs per annum.

**Table 1**

*Production of bamboos in various states of India in the years 2000-01 and 2001-02.*

| States                      | 2000-2001 | 2001-2002 |
|-----------------------------|-----------|-----------|
| Andhra Pradesh (MT)         | 66476.69  | 58182.91  |
| Arunachal Pradesh (Nos)     | 136247    | 28398     |
| Assam (NTAD)                | 500000    | 500000    |
| Chhattisgarh (NT)           | 71046     | 77031     |
| Goa (RMT)                   | 936000    | 611952    |
| Gujarat (MT)                | 128281    | 64917     |
| Haryana (MT)                | 19.90     | 52        |
| Jharkhand (MT)              | 4087.27   | 4829.17   |
| Karnataka (m <sup>3</sup> ) | 224819    | 191152    |
| Kerala (Nos.)               | 10594     | Nil       |
| Madhya Pradesh (NT)         | 111070.68 | 97672.02  |
| Maharashtra (Nos).          | 187619    | 213417    |
| Mizoram (Nos.)              | 19840422  | 17843568  |
| Nagaland (Nos.)             | 223450    | 35430     |
| Orissa (MT)                 | 7597.2    | 116.35    |
| Punjab (nos)                | 808895    | 493752    |
| Rajasthan (Nos.)            | 19,26,000 | 17,89,000 |
| Tripura (MT)                | 199124.86 | 138651    |
| Uttar Pradesh (Nos.)        | 3578720   | 3368200   |
| Uttarakhand (Nos.)          | 54480     | Nil       |
| West Bengal (NT)            | 89.38     | 119.13    |

20 bamboos = 1 Bundle;

60 Bundles = 1 N tonne;

2400 running meter = 1 N tonne

NT= Notional tonne,

MT= Metric tonne,

RMT= Running metre,

m<sup>3</sup> = cubic metre

(Source: *Forestry Statistics India-2003*, ICFRE, Dehra Dun).

**Table 2**

*Trade statistics of bamboo in Rajasthan State  
(1996-97 – 2004-05).*

| Year      | Bamboos                  |                      |
|-----------|--------------------------|----------------------|
|           | Out Turn<br>(lakh qtls.) | Value<br>(Rs. lakhs) |
| 1996-97   | 4.04                     | 60.67                |
| 1997-98   | 22.51                    | 225.06               |
| 1998-99   | 20.55                    | 308.30               |
| 1999-2000 | 20.57                    | 308.55               |
| 2000-01   | 17.91                    | 268.65               |
| 2001-02   | 17.98                    | 269.70               |
| 2002-03   | 16.57                    | 247.05               |
| 2003-04   | 17.72                    | 265.80               |
| 2004-05   | 19.06                    | 285.90               |

(Source: Rajasthan Forest Statistics 2005)

### **Government Programmes for Promotion of Bamboo Utilization**

Bamboo is a versatile group of plants which is capable of providing ecological, economic and livelihood security to the people. Till recently, it has remained confined to the forests (12.8% of forest cover); two-thirds of the growing stock being located in the North-Eastern States. Importance of the crop as a source of raw material for industrial and domestic use with its growing demand all over the country necessitated its cultivation in farm lands as well. Keeping in view the vast untapped potential of the bamboo plant, it has been decided to implement a scheme on National Bamboo Mission (NBM) for addressing the issues relating to the development of bamboo in the country. NBM have marked the thrust areas. From utilization point of view, Bamboo and livelihood and Marketing and trade of bamboo are two important areas. For the

promotion of bamboo utilization cottage and handicraft is major sector for employment generation and product diversification. The NBM is a centrally sponsored scheme, in which the contribution of the Central Government is 100%, implemented by the Division of Horticulture under the Department of Agriculture and Cooperation in the Ministry of Agriculture, New Delhi. The promotional and research scheme of NBM for bamboo utilization are summarized as follows :

### ***Handicrafts, Bamboo Marketing and Exports***

The purpose of this component is to provide and increase employment opportunities, preservation and introduction of new designs and mechanization of bamboo-based crafts as living heritage and to assist in marketing these products. The main objectives of this component are:

1. Introduction of Grading systems of round and primary processed bamboo.
2. Introduction of preservative methods (both conventional and chemical) according to use.
3. Conversion of niche bamboo handicrafts products to mass products.
4. Introduction of utility handicrafts through industrialized means.
5. Setting up of bamboo wholesale and retail markets near villages.
6. Marketing through Bamboo Festivals, Melas, Expos, Craft Bazaars, bamboo markets.
7. Introduction of an effective Electronic Information Flow system.

(a) *Bamboo Wholesale and Retail markets near village-level micro-processing units* : These units will be set

up all over the country. These markets, apart from other facilities, will have a computer and V-SAT facilities. These markets, apart from trading activities, will also keep track of the market information related to various bamboo products and thus, the farmers and the primary processors will have direct access to such information and data, which in term will help them to plan their activities well ahead. These Markets can be set up and maintained by the community themselves or in partnership with the State Governments. The State Marketing Boards can also take up this activity. The expertise of Development Commissioner (Handicrafts) will be utilized for the purpose. The total cost of one such Market has been estimated at Rs. 16.00 lakhs. Depending on proposals received from Development Commissioner (Handicrafts) and other Organizations, assistance will be provided to the extent of 25% of the cost subject, to a maximum of Rs. 4.00 lakh for general areas and 33.33% of cost, subject to a maximum of Rs. 5.33 lakh for Hilly/Tribal area.

(b) *Bamboo Bazaars* : A total of 195 Bamboo Bazaars will be put in place throughout the country. Adjacent to these Bamboo Bazaars, information centers are proposed. These Bazaars also would have computers, V-SAT facilities for keeping track of various demand supply of bamboo products, costs, user industries etc. These Bazaars can be set up and maintained by the community themselves or in partnership with the State Governments. The State Marketing Boards can also take up this activity. The expertise of DC (H) will be utilized for the purpose. The total cost of one such Market has been estimated at Rs. 27.00 Lakh. Depending on proposals received from DC (H) and other Organizations, assistance will be

provided to the extent of 25% of the cost, subject to a maximum of Rs. 6.75 lakh for general areas and 33.33% of cost, subject to a maximum of Rs. 9.00 lakh for Hilly/Tribal area.

(c) *Retail Outlets (Showrooms)* : To popularize various Bamboo handicrafts Products including processed shoots, a total no. of 10 Retail Outlets (Showrooms) would be established in 10 Metros. These outlets would also have V-SAT facilities. The total cost of one such Show-room has been estimated at Rs.40.00 Lakh. Depending on proposals received from DC (H) and other Organizations, assistance will be provided to the extent of 25% of the cost, subject to a maximum of Rs. 10.00 Lakh for general areas and 33.33% of cost, subject to a maximum of Rs. 13.33 Lakh for Hilly/Tribal area.

(d) *Participation in Domestic Trade Fairs* : In order to popularize and market various bamboo products throughout the country, at least 30 participants from each State will be chosen to participate in National Level Trade Fairs, at least twice a year. To and fro travel by railways, lodging, food and transportation etc. for the participants, including two truckloads of display products from each State would be provided. These would be project-based activities, as per proposals received from the States and the assistance provided would be 75% of the cost subject to a maximum of Rs. 3.75 lakh per event of 2 days.

(e) *Participation in International Trade Fairs* : To popularize the made in India Bamboo products worldwide, taking part in International Trade Fairs is a necessary. As such, at least 10 selected entrepreneurs from each State (to be selected from the

participants of the National Trade Fair) would be sponsored to display their products in Trade Fairs abroad. This activity would be done twice a year. These would be project based, as per proposals received from the States and the assistance provided would be 75% of the cost subject to a maximum of Rs. 7.50 lakh per event of 5 days.

(f) *Innovative Interventions* : Any new intervention in bamboo sector, which may lead to increase in farm income by the introduction of innovative technology, which are not covered under the NBM, or any other schemes of the Government will be covered under this category.

(g) *Market Surveys* : Although a large number of market surveys have been conducted in recent times on high value and up market bamboo products, yet there remains a massive gap to address the needs, requirements and profitability of low and medium value bamboo products that are being made. This is all the more necessary in view of the fact that all Financial Institutions and Banks while appraising project proposals lay stress on the marketability of the products to be produced. As such, it would be in track to conduct a market survey especially related to bamboo products like tooth-picks, window blinds, cotton ear-buds, skewers and the like which have been conventionally made of wood in our country and the consumers are used to it. This market survey, apart from estimating the demand supply chain and present players and future demands, will also highlight how bamboo products will have to be positioned and the market entry strategy thereby indicating pricing, supply position and branding. This project based activity would be done by the NBM directly through

a suitable Agency to be identified, after floating tenders and assistance will be 100%.

### **Research and Development**

The programmes under research and development will concentrate on technology generation as appropriate to each region/State keeping in view their specific agro-climatic and socio-economic conditions. Emphasis will be on effective documentation/transfer and dissemination of technologies available in India and abroad. The Indian Council of Agricultural Research (ICAR); Indian Council of Forestry Research and Education (ICFRE) Institutes such as Forest Research Institute, Dehra Dun, Rain Forest Research Institute (RFRI), Jorhat, Indian Institute of Wood Science, Bangalore (IWST), the State Forest Research Institutes, Indian Institute of Forest Management, Bhopal, Kerala Forest Research Institute (KFRI), Peechi, Indian Plywood Industries Research & Training Institute (IPIRTI), Bangalore, Indian Institute of Technology (IIT), Bombay; Indian Institute of Science, Bangalore, Regional Research Laboratories (RRLs), Central Agricultural Universities, State Agricultural Universities and other research institutes in the public sector having capabilities in this area will be the primary institutes for taking up research programmes on bamboo. Research programmes will be guided by the Working Group on R&D and will address identified and emerging needs in the areas of plantation, developing new agroforestry systems with bamboo, harvesting and sustainable management of bamboo resources, livelihood based ecosystem protection and improving the durability of bamboo.

## SUMMARY

Bamboo is a versatile group of plants which is capable of providing ecological, economic and livelihood security to the people. Importance of the crop as a source of raw material for industrial and domestic use with its growing demand all over the country necessitated its cultivation in farm lands as well. Bamboo can give yield up to 50 tonnes per hectare per year in managed stands. It is estimated that about one quarter of the biomass in tropical regions and one-fifth in sub-tropical regions comes from bamboo. Bamboo culms grow to more than 40 metres in three to four months in some species. India is producing the largest volume of pulp from *Dendrocalamus strictus* and *Bambusa bambos* (*B. arundinacea*). Approximately 5 million standard bamboos are extracted directly and indirectly from forests in Rajasthan, amounting to Rs. 100 million. For the promotion of bamboo utilization, cottage and handicrafts is a major sector for employment generation and product diversification. The annual consumption of bamboo is 4.5 million MT of which 1.9 million MT is utilized for paper making. Out of this one per cent is being derived from natural forests. Bamboo is basically a household plant species around the houses and compounds on farmlands. Keeping in view the vast untapped potential of the bamboo plant, it has been decided to implement a scheme on National Bamboo Mission for addressing the issues relating to the development of bamboo in the country.

**Key words :** Bamboo, Potential, Utilization, Handicrafts, National Bamboo Mission.

समझदारी भरे उपयोजन का महत्वपूर्ण संसाधन—बांस

वी० वशिष्ठ, जे०आर० मनमोहन, पी०एस० चौहान व एस०बी०एस० पाडेय

सारांश

बांस सर्वकार्योपयोगी पादपों का एक वर्ग है जिससे लोगों को पारिस्थिकीय, आर्थिक एवं आजीविका सुरक्षा उपलब्ध कराई जा सकती है। औद्योगिक एवं घरेलू उपयोगों का कच्चा माल स्रोत के कारण अपने महत्व और देशभर में सर्वत्र इसकी बढ़ती जा रही मांग ने खेतों की जमीनों तक में इसका लगाया जाना आवश्यक बना दिया है। अच्छी तरह प्रबन्ध की हुई इसकी सन्निधियों से बांस की 50 टन तक प्रति हेक्टे० वार्षिक प्राप्ति मिल रही है। अनुमान लगाया गया है कि उष्ण क्षेत्रों का लगभग एक चौथाई और उपोष्ण क्षेत्रों का लगभग पांचवां अंश जैवपुंज बांसों से ही प्राप्त हो रहा है। बांसों के सन्निस्तम्भ इसकी कुछ जातियों में तीन से चार महीनों के अन्दर 40 मीटर से भी ज्यादा लम्बे बढ़ जाते हैं। भारतवर्ष अपनी लुगदी का सबसे ज्यादा आयतन *डेण्ड्रोकैलेमस स्ट्रिक्टस* और *बैम्बूसा बैम्बोस* (*बैम्बूसा अरुण्डिनेसिया*) बांसों से ही तैयार कर रहा है। लगभग 50 लाख मानक बांस प्रत्यक्षतः और परोक्षतः राजस्थान के वनों से निष्कासित किए जाते हैं जिनकी कीमत रु० 1000 लाख बनती है। बांसों का उपयोग बढ़ाने के लिए कुटीर और हस्तोद्योग ही रोजगार उत्पादन कराने और उपज विविधता बढ़ाने वाले प्रधान सेक्टर हैं। बांसों का वार्षिक उत्पादन 45 लाख टन है जिसमें से 19 लाख टन बांस कागज बनाने को उपयोग में लाया जाता है। इसका एक प्रतिशत भाग, प्राकृतिक वनों से प्राप्त किया जा रहा है। आधारतया बांस घरों और प्रांगणों के आस-पास की कृषि भूमियों में लगाई जाने वाली घर परिवारों की ही पादप जाति हैं। बांसों की इस विशाल अप्रयुक्त पड़ी संभावना को देखते हुए देश में बांसों के विकास से सम्बन्धित समस्याओं को सुलझाने के लिए राष्ट्रीय बांस मिशन की एक नई योजना को क्रियान्वित करने का निर्णय किया गया है।

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