“........The programme envisages the cultivation of bamboo over two million hectares and promotion of technology and networking for enhancing trade. Economic and social benefits from these activities will lead to creation of 8.6 million jobs and market opportunities worth over Rs. 6500 Crore with investment of Rs. 2,600 Crore. This will be useful for additional development of the North Eastern Region............”

Dr. A.P.J. Abdul Kalam, former President of India, on the eve of country’s 56th Republic Day, highlighting the importance given by him to National Bamboo Mission.

In Indian mythology there is a belief that there existed a tree which was known as ‘Kalpavriksha’ and was capable of fulfilling the wish of someone who stood below the tree and made a wish. In our primary school days, we were taught that the coconut tree in the south was like a ‘Kalpavriksha’, for the residents of the region. That was so said as every component of a coconut tree had its use. The fruit no doubt was the main gift of the tree. But similarly the leaves, the trunk, the kernel of the coconut and the coir covering a coconut, everything was useful.

Just as coconut had multiple uses for the people in the south, bamboo was the ‘Kalpavriksha’ for the people of the north-eastern region. Food items, building materials, weapons, utensils for kitchen, bamboo cylinders for storage of water. There was nothing of bamboo which can be discarded as waste. Every farmer either in the hills or the plains of the North-east cannot be without a few clusters of different kinds of bamboo on his land. Bamboo also grew wild. Bamboo is really a ‘Kalpavriksha’ for the region. It fulfills numerous needs of an inhabitant and enables him to remain self-reliant in many respects.

Lately the entire world has started paying attention to putting bamboo to different non traditional uses. We come across new descriptions of bamboo as “Poor man’s timber”, “Timber of the future”, “Green gold” and similar others. Bamboo grew almost in every part of India. But the present-day situation is that the availability of bamboo in most parts is getting scarcer. Even Assam has started facing scarcity of bamboo. However, bamboo is still available in good quantity in the hill states of the region. In today’s India, the north-eastern region has the largest production of bamboo.

The country has focused its attention to promote cultivation and exploitation of bamboo to a maximum possible extent. The country now has National Bamboo Mission. Different states are also being motivated to constitute state-level missions. The main centre for technological input in respect of bamboo is located at Guwahati and it is named as Cane and Bamboo Technology Centre. The author of this article Shri Kamesh Salam is the Director of the Centre and an acclaimed authority on bamboo. He has written for Ishani an elaborate article on different aspects of bamboo dealing with many dimensions.

It also needs to be noted that bamboo is grown and used in almost all South East Asian countries. China in the present-day world has come out with many advanced technologies and different uses of bamboo. China also has the highest availability of bamboo in the world. India comes next to China.
The “Green Gold” of the 21st Century and commonly known as “Poor man’s timber”, bamboo played a significant role in human society since time immemorial and today it contributes to the subsistence needs of over a billion people worldwide. It has been traditionally used as fuel, food, for rural housing and shelter, fencing, tools and various other purposes. In modern days, it is being used as industrial raw material for pulp and paper, construction and engineering materials, panel products, etc. Bamboo, which can be grown easily, is much faster in growth than any known tree, and is eco-friendly and adaptable to various locality factors, is now becoming the most promising wood substitute. It has more than 1500 documented applications, ranging from medicine to nutrition and from toys to aircraft.

The north eastern region, a landmass of eight states, spread over an area of 262179 Km² representing around 8% of the total geographical area of the country with a population of about 39.04 million is a region which is abundant in bamboo resources. The region houses about two-thirds of the bamboo resources of the country spreading over an area of about 3.10 million hectares where 89 species of bamboos are available. This invaluable gift of nature to the region is integral to life and culture of all the ethnic groups of North-eastern India. Its multipurpose uses have made it an indispensable resource for the rural people. Being interwoven with the daily life of the ethnic groups, it has been incorporated in their cultural and social occasions also. Efforts backed by a surge in people oriented policies by the State Governments of the Region have begun to bear fruit. Bamboo being a principal natural resource, the people of the region in particular will be better served by this God given bounty, if we all get down to the task of economic taming of this resource. A look at the facts reveal that sustainable and economic utilization of bamboo will throw open a plethora of opportunities, especially for the rural poor. Continued technological advancement and research have put bamboo into more and more uses and as a raw material for several industries. A priority requirement for harnessing its economic potential would be to draw up a well coordinated multilateral approach. The raw stock of bamboo in the region is conservatively valued at Rs. 5,000 crores. Even with a modest target of two-fold value addition to the stock through suitable methodologies, an annual turnover of approximately Rs. 10,000 Crore can easily be generated in the Region.

The first bamboo based panel was developed in China in the 1940s. Since then, over 30 panel products have been developed. For instance in China, over 10,00,000 cubic meters of panels of various types are produced annually in some 200 Mills, whereas in India, industrial scale production of panels is confined to bamboo mat board with about 2000 cubic metres board produced by just seven mills. There are also enormous environmental and socio-economic implications and benefits. For example, in India, it is estimated that if Bamboo mat boards replace 1/4th of plywood, it can save 4,00,000 cubic metres of round wood, thereby preventing the disturbance to 30,000 hectares of forests per year. Furthermore, it will generate 16.7 million workdays of employment per year.
A large section of the society depend on bamboo for livelihood. Although the people of rural area cultivate a few species of bamboos in homestead land to cater to their domestic needs, most of the tribal people depend on the wild bamboos occurring in forests. Large resource of bamboo in the Region is mainly utilized for domestic, handicrafts and in paper industries. Many of the species which are available in the region have great farming potential. Apart from wastelands and degraded lands, bamboo can be grown in marginal farm and underutilized lands. There is also great scope of increasing the yield and productivity of the bamboo bearing forest areas through scientific management and by introducing quality planting stock of selected commercially important species. Farming is obviously related to utility, gap between demand and supply of raw materials, economic returns, etc. Therefore, setting up of industries for high value bamboo products, which require bamboo of uniform age, dimensions, quality and colour will enable the utilization of the resource in bulk and in turn generate further opportunity for farming.

The details of forest cover of the tribal district of N.E. Region and that of all India in the year 2003 are as under:

<table>
<thead>
<tr>
<th>Name of the State</th>
<th>Geographical Area of Hill district cover (Sq.Km)</th>
<th>Geographical Area of Tribal area of tribal Forest (Sq.Km)</th>
<th>Forest cover percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arunachal Pradesh</td>
<td>83743</td>
<td>83743</td>
<td>81.22</td>
</tr>
<tr>
<td>Assam (1)</td>
<td>78438</td>
<td>50137</td>
<td>24.04</td>
</tr>
<tr>
<td>Assam (2)*</td>
<td>319153</td>
<td>13158</td>
<td>68.70</td>
</tr>
<tr>
<td>Manipur</td>
<td>22327</td>
<td>17219</td>
<td>77.70</td>
</tr>
<tr>
<td>Meghalaya</td>
<td>22429</td>
<td>16839</td>
<td>75.08</td>
</tr>
<tr>
<td>Mizoram</td>
<td>21081</td>
<td>18430</td>
<td>87.42</td>
</tr>
<tr>
<td>Nagaland</td>
<td>16579</td>
<td>13609</td>
<td>82.09</td>
</tr>
<tr>
<td>Sikkim</td>
<td>7096</td>
<td>3262</td>
<td>45.09</td>
</tr>
<tr>
<td>Tripura</td>
<td>10486</td>
<td>8093</td>
<td>77.18</td>
</tr>
<tr>
<td>NER Total:26217971</td>
<td>253031</td>
<td>170681</td>
<td>67.45</td>
</tr>
<tr>
<td>All India:3287263187</td>
<td>1103463</td>
<td>407298</td>
<td>36.91</td>
</tr>
</tbody>
</table>

*Data on 3 hill districts of Assam namely Karbi Anglong, North Cachar Hills and Nagaon covering an area of 19153 Sq.Km.

Mass plantation of bamboos in forest areas and private land will go a long way in mitigating the situation of the depleting forest cover of the country in general and for the North-eastern Region in particular. Bamboo can conserve soil and water in catchments areas, minimize soil erosion and control flash floods in the valleys and plains. It is most effective in controlling landslides and can protect roadsides, riverbanks, canal banks and dam sites. In recent time, bamboo is seen as the ‘Wonder Plant’ of the 21st Century and as substitute of wood. It can mitigate the pressure on natural forests and contribute to conservation of biodiversity. Bamboo is the best plant for carbon sequestration to retard pace of climate change.

The Government of India has launched the “National Bamboo Mission”, a 100% centrally sponsored scheme through the Department of Agriculture and Co-operation under the Ministry of Agriculture, to promote holistic growth of the bamboo sector through area based regionally differentiated strategies. Similarly, the North-eastern Regional Bamboo Mission (NERBaM) under North-eastern Council, has also taken up implementation of a comprehensive Short Term, Medium Term and Long Term Plan for development of Bamboo for poverty alleviation and saving forests, specially for North-eastern Region.

**Interest in bamboo increasing the world over**

Many nutritious and active minerals such as vitamins, amino acids, flavine, phenolic acid, polysaccharide, trace elements and steroid can be extracted from bamboo culm, shoot and leaf. And all these have anti-oxidation, anti-aging, anti-bacterial and anti-viral functions. These are valuable in health care, and can be processed into beverage, medicines, pesticides, or other...
household items like toothpaste, soaps, etc. At present, quite a few products have found their way into markets:

– Bamboo leaf contains 2% to 5% flavine and phenolic compound that have the power to remove active oxy-free-radicals, stopping sub-nitrification and abating blood fat. Flavine beverage and beer have been widely accepted particularly in east Asian countries like China, Korea and Japan mainly because of their value in health care.

– Some materials extracted from bamboo can be used in fresh flavour preservation or food storage application.

– Some additives obtained from bamboo are used in food such as bamboo juice, beverage, bamboo flavoured rice, etc.

– Bamboo shoot is one kind of ideal vegetable being free in pollution, low in fat, high in edible fiber and rich in mineral. It is cold in properties, functions well in removing sputum, enhancing digestion, relieving toxicity, improving diuresis and is often used for healing swollen state of tissues or edema and abdominal disease in which watery fluid collects in cavities or body tissues called ascites. The shoot also contains saccharine which can resist little white mouse tumour and tumour – 180 and also has anti aging elements.

Due to all these chemical properties of bamboo, and its capacity to set right various global problems such as the pollution of air and water resources, the aging of population and increasing prevalence of old age diseases, unprecedented interest in bamboo has been aroused the world over. Of late, research has shown that bamboo charcoal is one of the base material for human health right from water treatment to its uses as shield from electro magnetic radiation. With the increasing demand for a return to nature, there is an increasing preference for products processed or extracted from plants. With its high growth rate, wide range of applications and high renewing ability, bamboo resources occupies a significant position in the 21st century.

### Market size of Bamboo

<table>
<thead>
<tr>
<th>Product/ Application</th>
<th>Current Market (Rs.)</th>
<th>Expected Market (Rs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bamboo shoot</td>
<td>4.8 crore (2001)</td>
<td>300 crore (growing at 25%)</td>
</tr>
<tr>
<td>Bamboo as wood substitute</td>
<td>10,000 crore</td>
<td>30,000 crore (in next 20yrs)</td>
</tr>
<tr>
<td>Bamboo Ply board</td>
<td>200 crore</td>
<td>500 crore</td>
</tr>
<tr>
<td>Bamboo Ply board for use in trucks and railways</td>
<td>1000 crore (in 2015)</td>
<td>3408 crore</td>
</tr>
<tr>
<td>Bamboo flooring</td>
<td>100 crore (Domestic)</td>
<td>100 crore (Export) (2015)</td>
</tr>
<tr>
<td>Bamboo pulp</td>
<td>100 crore</td>
<td>2088 crore (2015)</td>
</tr>
<tr>
<td>Bamboo furniture</td>
<td>380 crore</td>
<td>3265 crore (2015)</td>
</tr>
<tr>
<td>Building and construction Material</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scaffolding</td>
<td>-</td>
<td>861 crore (2015)</td>
</tr>
<tr>
<td>Housing</td>
<td>-</td>
<td>1163 crore (2015)</td>
</tr>
<tr>
<td>Roads</td>
<td>-</td>
<td>274 crore (2015)</td>
</tr>
<tr>
<td>Bamboo grids</td>
<td>-</td>
<td>1000 crore (2015)</td>
</tr>
<tr>
<td>Tiny and cottage industry</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agarbatti, Miscellaneous Industry.(ice cream sticks, fire cracker, lathis, ladders, etc.), Pencil/match Industry</td>
<td>394 crore</td>
<td>600 crore</td>
</tr>
</tbody>
</table>
Bamboo and the socio-economic life of the region

The vast areas of the land in the NE region is predominantly owned or occupied by the tribal communities which have their own peculiar system of land administration. The concept of ownership of land among tribals is different. They believe that the people who work on the land have a right to the produce only. As such there exists a system of community ownership of land, leading to an individual having no stake in the property. Thus there is no impetus to grow and expand. Property rights in the context of the North-east Region has two aspects:

Restrictions on grant of property rights to non-natives (includes people from other states of the NER.

Investors have not been able to set up industry & business. This has given rise to ingenious ways of circumventing the restrictions, and transacting business exploitatively.

The Salient Features of bamboo economics in the North-east region:

1. Except in Tripura & Sikkim the forest cover in the region is in decreasing trend which is reduced from 160242 Sq.Km. in 1997 to 159108 Sq.Km. in 2001. In case of Tripura & Sikkim, the forest cover has been increased from 5535 Sq.Km. to 7065 Sq.Km. and 3041 Sq. Km. to 3193 Km. respectively. However, over all, the region showed an increase in forest cover which increased from 168818 Sq.Km. in1997 to 169366 Sq.Km. being 64.60% of the geographical area.

2. Tribal communities of the region heavily rely on forest resources for their subsistence and 90% of the population use biomass as an important source of energy.

3. In most of the N.E. States bamboo forms an important non-timber forest produce with immense potential.

4. The NER has a rich heritage of traditional skills in weaving, cane & bamboo crafts, carpentry, wood carving, etc., to meet domestic requirement.

5. About 89 species of 12 genera out of 136 species under 22 genera in the country are found in the North-east. Around two-thirds of the total bamboo resources of India covering 8.96 million hectares exist in the region.

6. The major clump forming bamboo species constituting the growing stock are Dendocalamus strictus (45%), Bambusa bamboos (Kotaba in Brahmaputra valley and Baroowa in Barak valley) (13%), D. Hamiltonii (phulrua in Mizo and Kakopesha in Garo) – (7%), B. Tulda (Jati in Assam, Mirtinga in Tripura) (5%), and B. Pallida known as Makla in Assam, Markel in Tripura, Naohel- Wa in Manipur accounts for 4% of the stock. Melocanna Bacifera, a non-clump forming bamboo popularly known as Muli in Tripura and Mautak in Mizo, accounts for almost 20% of the growing stock and is found all over the North-eastern region.

7. The ten major species used for commercial purposes are Bamboosa bambos, B. balcooa, B. nutans, B. tulda, B. pallida, Dendrocalamus strictus, D. hamiltoni, Malocanna bacifera, Schizostachyam polymorphum (locally known as Bajal or Nal in Assam and Wa chall in Garo or Paphals by Lepcha).

8. The major user of bamboo in the North-east is the paper industry, which consumes about 68% of the total annual production from the government forests. In addition, bamboo supports a number of traditional cottage industries including production of handicrafts, incense sticks, and related articles.

9. A steady and reliable source of quality raw material supplies is a fundamental need to the success of any planned economic activity.

- In bamboo sector, despite the region and the country having one of the largest resource bases in the world, there are tremendous supply/demand problems that need to be overcome for successful development of the sector.

The constraints

There were several constraints that were identified in the course of the roundtables and field visits as well as from secondary sources. These can be listed as follows:

The regulatory constraint on transit of bamboo as well as on harvesting from private plantations,
The irregular supply of bamboo to industries,
Poor market linkage of the products,
Technology application for new product design along with testing, certifying of products,
Lack of an institute on bamboo application and technology,
Lack of application of known scientific methods in plantation, poor post-harvest treatment, and up-gradation of skill formation,
Waste utilisation, and
Competition from Chinese products.

The regulatory restrictions on transit and harvest of bamboo are the biggest impediment to the growth of bamboo based industries and applications. This happens because bamboo is defined to be a tree, when it is a grass and therefore it is treated at par with timber and other forest produces.

The transit pass requirement adds to delay and increases the cost due to red tapism. For example, the cost of one pole of *Dendrocalamus Strictus* is rupees ten but by the time the pole is available for further processing in Hyderabad city, the price increases to rupees forty per pole. This arises from the severe restrictions on movement of bamboo. Failure to get movement licenses force people to move to other plantation trees like eucalyptus.

Another drawback on the path of realizing the potential of bamboo is the poor market linkage and technology application. New technology and product options need to be developed. Only when this happens will it encourage manufacturing units to be established. A public interest awareness campaign was felt to be essential for promoting the sector by most of the industry representatives throughout the country. The sector cannot thrive by making handicraft items like baskets anymore. There has to be a movement towards lifestyle products and utility products. Further therefore, there is the need for market establishment of these products, with product testing for quality being a necessity which will ultimately lead to market acceptability. Bamboo technology is not taught in India per se. So it was felt that there is a need for a bamboo technology institute, which can also impart the desired training. It needs to be located where the bamboo industry shows potential. The institute can also provide immediate solutions to local problems and help disseminate the information after research is carried out for further development. There was the need for a credible certifying organisation that would be accountable on quality issues. This can help the grower grow appropriate varieties that have industrial applications and the institute can spread awareness among states that will promote the use of bamboo. Presently, CBTC is designated by the Ministry of Labour, Govt. of India as a certifying agency for cane and bamboo artisans.

Several other constraints also stand in the way of development of this sector in India, like lack of application of known scientific methods in plantation, poor post-harvest treatment, product development and up-gradation of skill formation. Low yield per hectare reveals poor management of extant bamboo forests. Inadequate trained manpower and inadequate infrastructure for large scale harvesting in the event of gregarious flowering was also identified as a potential constraint. The bamboo cutters are usually exploited in the present system, especially by the Paper Mills, with no welfare schemes to benefit them and they work at abysmally low daily wage rates. As a result, many migrate in search of jobs. Bamboo Plantation activities over the next 5 years could generate about 50.4 million man days of work according to the Planning Commission. In the nursery sector, total estimated employment to be generated every year is to be around 9.7 lakh man days. Besides this, there will be employment generation in both skilled and unskilled segments in the handicraft sector.

The most important bottleneck was identified as the regulatory bottleneck, and as long as this was not meaningfully addressed, the sector cannot grow beyond a certain threshold level. In general, there seemed to be a strong promotional role of a governmental organisation, which would help generate awareness on bamboo products, run a nationalized campaign and help develop product-market linkages, apart from handholding the sector in the initial stages. The government initiatives and agencies created for the development of the sector was described and although there seems to be overlapping of jurisdictions, the sector is presently at such a nascent stage of development that there cannot be shortages of initiatives. What perhaps is lacking is a more
concerted effort and better planning, and to overcome this drawback, there should be a permanent ‘Board’ for the development of the Bamboo sector in India, in lines of the ‘Coffee Board’ or the ‘Tea Board’. In early 2005, the North Eastern Council launched the North East Regional Bamboo Mission (NERBaM). Under the provisions of the North East Bamboo Mission, the Cane and Bamboo Technology Centre was identified as a Special Purpose Vehicle to implement the North East Bamboo Mission and an Action Plan was also drawn up, in which key areas requiring intervention were identified. Thereafter, since October 2004, the Cane and Bamboo Technology Centre has been carrying out the mandate of the North East Bamboo Mission.

Similarly, the Department of Science and Technology having launched National Mission on Bamboo Application (NMBA) especially for technology application in bamboo sector, National Bamboo Mission by the Ministry of Agriculture and Co op has been launched for holistic development of the sector with initial focuses on bamboo cultivation in both forest and non-forest/private plantations and it is hoped for that in future bamboo will be treated at par with other plantation crops once the viability of private plantations is demonstrated in different parts of the country.

Need for institutional reforms
While there are local practices with respect to production and processing, there is a need for developing appropriate management techniques in the production-to consumption system. Moreover, there seems to be a perpetual tussle between the forest official and the grower/extractor with respect to its control. Most of the bamboo found in India is forest bamboo. Hence the tussle has also been between the forest department and the artisans, etc. The dialogue has been on de-reservation of forests for bamboos as indicated earlier, reclassification of bamboo as an agricultural crop rather than a tree, etc. In the NE, while most of the land and forests are owned by the community, there exists a mahaldari contract system for the sourcing of raw bamboo from the extraction centers. This system leaves a lot of scope for corruption and leakages including trading of the contracts.

The large inflow of funds into the NER from the Central Government has resulted in a passive work culture and created government monopoly in employment. Funds earmarked for development of the region have been channellized elsewhere. This has resulted in a marked disparity of income between the grower households and the trader and government class leading to community disharmony. Grower households can increase their income levels by participating in the bamboo-based industry.

Sustainable development through community forestry/farming has successfully enabled a number of developing economies to elevate living standards and reduce the divide between the business class and the local communities and thereby set up organised industry based on forest or agricultural-produce. The NER with its substantial bamboo resources and historical strength in the wood industry is highly compatible with the requirements of the sustainable development model. The only weak links in the chain are related with policies and regulations and market development. Changes in these can be brought about through proper presentation of facts to stakeholders in a phased manner.

Now is the time for action. The problems that exist in the NER to date – lack of land tenure records, the practice of jhum cultivation and the almost feudal hold of the district councils – can all be put to positive utilisation, starting with the humble and endearing bamboo with which the locals are as familiar as with themselves.

CBTC’s Intervention
The Cane and Bamboo Technological Upgradation and Networking Project was launched in the North-eastern Region of India taking into account the vast resources and potential of cane and bamboo in the region. Prior to the launching of this Project, these two important plants, i.e., cane and bamboo was simply taken for granted as these are common in most areas. These plants were basically used for four main purposes only, i.e., for construction of houses/barns and small bridges, as food, in the Paper Industry and in the handicrafts sector. There was no awareness that when we may end up bereft of these natural resources. A similar event has already taken place in
respect of timber. Taking a serious view of the wanton destruction of forest resources, the Hon'ble Supreme Court of India had banned the felling of trees in forest lands. This had an immediate impact as a large number of industries, which were dependent upon timber had to close down. Taking a cue from this, the day is not far when a similar ban might need to be imposed on the felling of immature bamboo to maintain the growth and vigour of the stand.

The Cane and Bamboo Technology Centre (CBTC) came into being in December, 2000 as an offshoot of the UNDP/UNIDO project. After the 1st phase of the UNIDO project period was over in 2004, CBTC has been registered under the Society Registration Act and since then it has been functioning as an autonomous body under the NEC. It has retained some of the committed employees while taking in many more staff with different specialization. During the few years of existence, the society has established itself as a most remarkable institution for competence and information especially for cane and bamboo. It has been catering to technical and technological equipment needs of the people in the region in collaboration with several renowned institutions and manufacturers within and outside India.

Thus CBTC has been playing the diverse role of facilitating the promotion and propagation of knowledge as well as machinery and infrastructures to the beneficiaries/entrepreneurs on bamboo and cane. This has greatly improved the optimum utilization of these resources. In other word, the gap between the manufacturers of the machinery and the end user and for that matter, the gap between the industrial unit and the poor villagers have been narrowed down to a great extent through the effort of CBTC

**Over the years, the CBTC has developed several core competencies:**

- A hub for information, technologies and networking on Bamboo sector
- A vehicle for multi-disciplinary approach to varied application of Cane and Bamboo
- Manpower development and training of craft persons, entrepreneurs and trainers
- Coordinator for technical, legal and economic policies on cane and bamboo
- Consultation to small and medium scale entrepreneurs in the cane and bamboo Industry

**The main collaborating partners of CBTC include:**

- Development Commissioner (Handicrafts)
- Building Materials and Promotion Council (BMTPC)
- Indian Plywood Industry Research & Training Institute (IPIRTI)
- German Technical Cooperation (GTZ)
- National Institute of Design (NID)
- Forest Research Institutes

At present, CBTC is one of the Bamboo Technical Support Group [BTSG] for the National Bamboo Mission (NBM) covering the eight NE states and the states of West Bengal, Jharkhand, Bihar and Orissa under the National Bamboo Mission, implemented by the Ministry of Agriculture, Govt. of India.

The IIInd Phase of the UNIDO–CBTC project “Sustainable Development of Bamboo Industries for Livelihood Creation in North Eastern India” which aims at creating Cane and Bamboo clusters is due for implementation in the near future and it is fervently hope that this initiative of the UNIDO for the region will take us steps ahead in the sector for which the involvement of the states and the people is very crucial for its successful outcome which aims at making this so-called “Poor man’s Timber into the Timber of 21st Century”..

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- CBTC documents.
*Expert Member, Apex Committee and Steering Committee of National Bamboo Mission Ministry of Agriculture and Co-op, Govt. of India. President, World Bamboo Organization (WBO). He can be contacted at kamesh@caneandbamboo.org.