RFRI Conducts Training Workshop on Bamboo Resource Development for Addressing Livelihood Concerns of Communities

The 2-day training workshop on *Bamboo Resource Development for Addressing Livelihood Concerns of Communities* was sponsored by the Ministry of Environment, Forest and Climate Change, Government of India for the officers of the Indian Forest Service. Twenty three officers from various parts of the county participated in the workshop. The workshop was inaugurated by Dr. K. M. Bujarbaruah, Vice Chancellor, Assam Agricultural University, Jorhat (Assam). Shri R. P. Agarwalla, IFS (Retd.), former PCCF of Assam participated as Guest of Honour. The workshop consisted of theoretical sessions mainly focussing on the bamboo resources of the country, traditional value chain of bamboos, and the modern value chain. The workshop also included practical sessions of visit to Bokota, Sivasagar (Assam), where the village acts as a cluster making bamboo handicrafts, and to the Nagaland Bamboo Resource Centre, Dimapur (Nagaland) where all modern value addition practices are adopted to manufacture bamboo charcoal, bamboo shoot products, bamboo furniture, bamboo constructions, modern stylish handicrafts for the urban and export market, etc. Emphasis was on the different value chains that exist within the North-Eastern region, which will be true of the other regions of the country also.

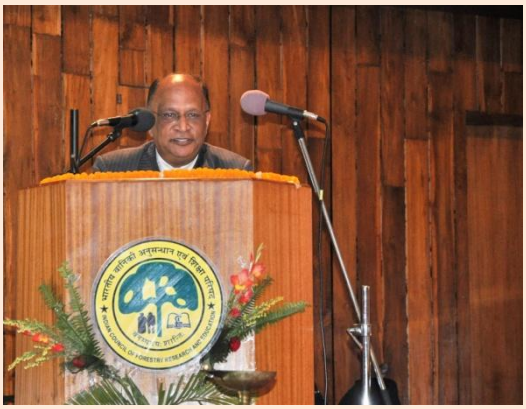
Inaugural session: At the outset, Dr R. S. C. Jayaraj, IFS, Director of Rain Forest Research Institute welcomed the participants, the Chief Guest, Guest of Honour and all the guests who graced the inaugural function. Shri R. P. Agarwalla, who had functioned as the Mission Director of the State Bamboo Mission of Assam, for considerable period, elaborated on the bamboo potential in Assam and how the forest department had taken action to promote its cultivation and sustainable use. Dr. K. M. Bujarbaruah, Vice Chancellor of Assam Agricultural University, Jorhat (Assam) in his inaugural address highlighted the importance of bamboo in the culture of North-Eastern India, and how this plant has become an integral part of daily life here. He also touched upon the bamboo research that has been taken up by the Assam Agricultural University. Shri R. K. Kalita, Scientist-E & Course Director, offered vote of thanks.

Glimpses of the Inaugural session

Dr. K. M. Bujarbaruah, Vice Chancellor, Assam Agricultural University being felicitated

Shri R. P. Agarwalla, IFS (Retd.) Former PCCF, Assam being felicitated

Lighting of lamp by the Chief Guest



Address by Shri R. P. Agarwalla, the Guest of Honour

Welcome address by Dr. R. S. C. Jayaraj, IFS, Director, RFRI

Address by the Chief Guest, Dr. K. M. Bujarbaruah, Vice Chancellor, AAU

Technical sessions:

In the first session, Shri R. P. Agarwalla, IFS (Retd.) gave an overview of the bamboo resources of the country. He informed that 17% of the forest cover in the country is bamboo forests, and two-third of the growing stock is found in the northeast India. Dense bamboo availability is the maximum in Arunachal Pradesh, followed by Mizoram and Manipur in the North Eastern States. The productivity of bamboo in the country is varying from 0.216 to 0.4 MT/ ha with an average of 0.33 MT/ha, which is very low compared to the productivity seen in China which is 5 MT/ha. He outlined the various schemes that have been undertaken by the Government for promotion of bamboo sector, viz., National Bamboo Mission, National Mission on Bamboo Applications, bamboo plantation under the National Afforestation Programme, and plantations under Rural development schemes.

While speaking about bamboo in Assam he mentioned that there are 7,20,000 ha of bamboo forests and 79,000 ha of homestead plantations in non-forest areas. There are two paper mills at Jagi Road and Panchgram which are the major users of bamboo, and one mill is under construction at Matia in Goalpara district. The State Bamboo Mission in Assam had aimed at increasing the coverage and productivity of bamboo, marketing of bamboo and its handicrafts, convergence and synergy among stakeholders and promotion of technology and traditional knowledge. The Mission had working groups on Research, Plantation development and Handicrafts & Marketing. At grass roots level in involved the Joint Forest Management Committees, Self-Help groups, farmers and entrepreneurs. The Agricultural universities in the State and Rain Forest Research Institute were involved in research while, nursery and plantations were done by the forest department and the public.

He described the activities of Assam Forest Department in promotion of bamboo through various institutions, viz., Bamboo Storage and Treatment Plant at Makum, Bamboo Artisan production Centre at Dhekiajuli, Bamboo treatment plant at Cachar, Bamboo Handicrafts Training and Production Centre at Guwahati, Bamboo Handicrafts Production Centre at Bajiagaon, Bamboo museum at Nagaon and Lankeshwar, Bamboo craft training centre at Diphu, Bamboo showroom at Tezpur and Harmutty, Bamboo Information Centre at Bamunigaon, and Bamboo bazaar at Margherita and Badarpur.

In the second session, Dr T. C. Bhuyan, Retired Scientist of RFRI spoke about the techniques of bamboo planting stock production, cultivation and management, as practiced today in the

North-Eastern region and the advancements that are required for quality planting stock production and improvement in yield. Management of bamboo nurseries and plantations has potential to serve as a means of livelihood, and already there are community bamboo nurseries that are popular in Tripura. However, in Assam there is not much of organized nursery management for bamboos, except by the forest department. The people cultivate bamboo only in their homestead gardens, for which elaborate nursery is not required. However, establishment of nurseries can become a means of livelihood. Quality planting stock production using plus clumps identified by selection in the region, can boost the productivity of the bamboo crop and can sustain the increase in demand in future.

In the backdrop of this, Dr. Bhuyan spoke about the utility of bamboo in North-East India, the advantages of using bamboo in place of timber, its contribution to ecological, economic, food, and livelihood security of the region. He essentially touched upon the use of bamboo in reclamation of degraded sites, its role in carbon sequestration, use in protection of watershed and stream banks, and its use as a fuel which can reduce the pressure on forests for fuel-wood extraction in the northeast. He also discussed about the industrial uses of bamboo especially the *Agarbatti* industry in the northeast, paper and pulp industries, and the new generation bamboo products which are slowly picking up in the region. Bamboo is an essential part of cuisine in the region, and provides food security in this remote part of the country. The novel products like bamboo wine, vinegar, mushrooms growing on bamboo litter are also adding to the food from bamboos. He discussed about the employment potential of the bamboo sector, which generates 432 million workdays annually at present, and can increase tremendously if more value added products are produced, and simultaneously the supply side of the value chain is also improved by production of quality planting stock, and high yielding plantations.

Dr T. C. Bhuyan also spoke on the biology of bamboos, their taxonomic status, differentiation into woody and herbaceous bamboos, types of rhizome (monopodial, sympodial and amphipodial), global distribution, distribution in India, etc., and described some of the commercially important bamboos, viz., *Bambusa bambos, B. balcooa, B. nutans, B. polymorpha, B. tulda, B. pallida, B. vulgaris, Dendrocalamus hamiltonii, D. giganteus, Melocanna baccifera*, and *Thyrsostachys oliveri*. Speaking on bamboo applications he stated that there are more than 1500 documented uses of bamboo, and the consumption pattern as of now, indicates maximum usage of bamboos as scaffolding, followed by handicrafts and paper

industry. The current demand is 27 million MT, but the existing stock is just 13.47 million MT. To meet the demand, quality planting stock production and large scale commercial cultivation are required.

A glimpse of technical sessions and field visit on the first day

Shri R. P. Agarwalla, IFS (Retd.) speaking during the workshop

Dr. T. C. Bhuyan, Scientist (Retd.) delivering his speech

Participants at the village cluster in Bokota, Sivasagar (Assam)

Shri Mohan Saikia, Master Craftsman explaining about the traditional bamboo handicrafts and the village cluster

Interaction with villagers

Interaction with the villagers

Thereafter, Dr T. C. Bhuyan elaborated the nursery techniques of bamboos, methods of selection of superior clumps for propagation, plantation techniques, silviculture including clump management, fertilization, working of flowered clumps, harvesting methods, agroforestry with bamboo, etc. The two objectives of bamboo sector should be bamboo resources development and bamboo product development. He outlines the various actions required for promotion of bamboo sector, viz., selection of superior planting materials, establishment of large scale, high-yielding plantations, development of cottage and small-scel industries, promotion of medium and large scale industries, creation of infrastructure for Research and Development, Market information support, export promotion, institutional framework for flow of investment, training in processing of bamboos and setting up of demonstration centres.

After the lectures at RFRI, the participants were taken to Bokota village in Sivasagar district of Assam, where there are village clusters engaged in manufacture of traditional household articles of bamboos and handicrafts. There the participants were briefed about the activities of the clusters by Shri Mohan Saikia, Master Craftsman. The traditional use of bamboo in housing, fencing, fishing equipments, agricultural equipments, etc., were shown. The village setting in Assam, with homestead gardens of bamboo were also shown to the participants.

On the second day of the workshop, first there was an exposure visit to the Nagaland Bamboo Resource Centre, wherein Shri Shakiba Yan, explained the various activities of the Centre. The participants were shown the production of bamboo charcoal briquettes, which are used mostly in the metropolitan cities in high-end hotels and exported abroad. They were also exposed to the bamboo preservation treatment using pressure treatment plant and the Boucherie process. The bamboo mat board preparation, production of bamboo corrugated roofing sheets, techniques of bamboo construction, modern bamboo furniture making, bambusetum, bamboo nursery, and bamboo museum were shown to the participants.

In the second session, Ms Amongla C., Member, Implementation Team, NBRC explained about the bamboo shoot processing. She informed that so far 109 species of bamboo have been found edible, worldwide. Bamboo shoots have a toxic cyanogenic glycoside called taxiphyllin, which degrades in boiling water. She explained about the nutrient value of bamboo shoots, and the benefits of consuming them. She explained that the world bamboo shoot market is worth USD 1.5 billion, as of 2008. The most common bamboo shoot eaten is

of *Dendrocalamus asper* in Thailand, *D. latiflorus* and *Bambusa oldhamii* in Taiwan. In Nagaland, the most commonly eaten species is *Dendrocalamus hamiltonii*. While explaining about the export potential, she said that the main species are *Dendrocalamus asper* and *D. siamensis*, and more than 90% of export is in the form of steamed shoot, while the rest are deep-frozen or dry shoots. China and Thailand are the leading exporters of bamboo shoot, while Japan, USA, and Australia are the major importers. The major products of bamboo shoot are dried shoots in the form of slivers or slices, canned shoots, fresh shoots and bamboo beverages, such as, fermented juice, fresh juice and alcoholic drink.

Glimpes of field visit at Nagaland Bamboo Resource Centre, Dimapur (Nagaland)

Shri Shakiba Yan briefing the participants about the Nagaland Bamboo Resource Centre

Explaining about bamboo treatment

Bamboo charcoal briquettes making

Bamboo mats making

Visiting Bamboo nursery

Visiting Bamboo museum

She also explained the process of harvesting of bamboos for shoot. The harvest is done in June-July, and shoots produced in August-September are retained to maintain the culm density in the clump. Over-harvesting decreases the quality as well as quantity of shoots and degrades the stand. Harvest is done when the shoot is less than 30 cm in height, and cooked immediately to deactivate all enzymes. For canning, it is boiled within four hours early in the morning, when atmospheric temperature is low. They are stored in brine solution with 20% salt and 1% acetic acid/ ascorbic acid. Storage is at 86% humidity and 5^{o} C. For pickling, the shoots are cut to desired size and boiling is done twice. Ms Amongla demonstrated the process to the participants.

The third session was on *Bamboo Livelihood Issues in Northeast India* by Dr Tolto Metha, Member, Implementation Team, NBRC. He explained about the Bamboo policy of Nagaland which seeks to develop the bamboo resource as well as the enterprise. He said that Nagaland government is promoting the plantation of six bamboo species, viz., *Bambusa tulda, B. balcooa, B. pallida, Dendrocalamus latiflorus, D. hamiltonii* and *Schizostachyum dulloa*. Plantation is being done involving the local communities. He highlighted the use of bamboo plantations for reclamation of the areas degraded by shifting cultivation, especially in Mokokchung, Longleng, Mon, Kiphire, and Peren. He also briefed the participants about the activities of the Centre in promotion of handicrafts development, bamboo construction development, bamboo interior design, bamboo preservative treatment, bamboo venetian blinds and mats development, charcoal production, furniture design and development, bamboo shoot production and its vacuum packaging, pickle production and the marketing through use of modern information technology options. He also highlighted the capacity development programmes in plantation and harvesting techniques. The Centre is

concentrating on high-value products having niche markets in the cities and abroad, thus helping people to earn their livelihoods.

Glimpses of technical sesssions on the 2nd day

Visiting Bamboo emporium

Ms. Amongla discussing about bamboo shoot processing

Dr. Tolto Metha talking about bamboo in the livelihood of northeast India

Dr. R. S. C. Jayaraj making the concluding remarks

Distribution of participation certificates by Shri M. K. Sapra, IFS, PCCF, Madhya Pradesh

Valedictory session chaired by Shri M. K. Sapra, PCCF, Madhya Pradesh and Shri A. K. Srivastava, PCCF, Telengana, and drawing of recommendations.