

Training Report

**Bamboo Technical Support Group (BTSG),
ICFRE sponsored**

**Six-day training programme on
'Bamboo Nursery and
Management'**



Institute of Wood Science and Technology

**(Indian Council of Forestry Research and Education)
P.O. Mallewaram, Bengaluru- 560003.
(An Autonomous body of Ministry of Environment, Forest
& Climate Change, Govt. of India)**

2020

Bamboo Technical Support Group (BTSG), ICFRE sponsored

Six-day training programme on

'Bamboo Nursery and Management'

20th -25th January, 2020

Training Report

Prepared by:
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P.O. Malleswaram, Bengaluru- 560003.
(An Autonomous body of Ministry of Environment, Forest & Climate Change, Govt. of India)

Bamboo Technical Support Group (BTSG)-ICFRE

Six-day training programme on 'Bamboo Nursery and Management'

Report

Six-day training programme on 'Bamboo Nursery and Management', sponsored by BTSG-ICFRE, Govt. of India, was organized at Institute of Wood Science and Technology, Bengaluru from 20th to 25th January, 2020. A total of 25 participants took part in this training program.

The training programme included following:

- Technical sessions – 15
- Field visits – 2
- Demonstrations - 2
- Lab visits – 2



INSTITUTE OF WOOD SCIENCE & TECHNOLOGY
(Indian Council of Forestry Research & Education)
(Ministry of Environment, Forest and Climate Change), Govt. of India
18th Cross, Malleswaram, Bangalore-560003



Bamboo Technical Support Group (BTSG), ICFRE sponsored

Six-day training programme on 'Bamboo Nursery and Management'

Date: 20-25, January 2020

Time: 9.0 AM to 5.30 PM

Venue: Lecture Hall, IWST, 18TH Cross, Malleswaram, Bangalore -560003.

PROGRAMME SCHEDULE

Day 1 (20.01.2020)		
9.00 AM to 10.00 AM	Registration	
Session - 1: Inaugural		
10.00 AM to 10.15 AM	Welcome address: Dr T.N. Manohara, Scientist –E, Silviculture and Forest Management Divisions	
10.15 AM to 10.25 AM	Address by Dr. V.P Tewari, Scientist-G, GCR, IWST	
10.25 AM to 10.35 AM	Address by Chief Guest Shri Raj Kumar Srivastava, IFS, APCCF, (NFAP & BM)	
10.35 AM to 10.40 AM	Vote of thanks	
10.45 AM to 11.30 AM	High Tea & Group Photo	
Session – 2: Technical		
Time	Topic	Resource Person
11.30 AM to 12.30 PM	Overview of Bamboo in India.	Dr. T.N. Manohara, Sci- E, SFM Division
12.30 PM to 1.30 PM	Visit to Xylarium	Mr. Sandeep Chakraborty, STA, SFM Division. Mr. Venkatesh Murthy, MTS, SFM Division
1.30 PM to 2.30 PM	Lunch break	
2.30 PM to 3.30 PM	Bamboo genetic resources	Dr. T.N. Manohara
3.30 PM to 3.45PM	Tea break	
3.45 PM to 5.30 PM	Bamboo propagation through tissue culture	Dr Tresa Hemalton, Sci-B, SFM Division
Day 2 (21.01.2020)		
10.00 AM to 11.30 AM	Bamboo Macro propagation Techniques	Shri V. Shettappanavar, IFS, Head, SFM Division.
11.30 AM to 11.45 AM	Tea break	
11.45 AM to 1.30 PM	Bamboo Propagation Techniques and hands-on training at IWST Nursery	Shri V Shettappanavar, IFS, Head, SFM Division; Mr. Sandeep Chakraborty, STA, SFM Division.
1.30 PM to 2.30 PM	Lunch break	
2.30 PM to 3.45 PM	Visit to Tissue Culture Laboratory, IWST.	Ms. Almas Khannum, STA, SFM Division
3.45 PM to 4.00 PM	Tea break	
4.00 PM to 5.30 PM	Visit to Museum and Library	Mr. Sandeep Chakraborty, STA, SFM Division.

Day 3 (22.01.2020)		
9.00 AM to 5.30 PM	Visit to M/s Grow More Biotech, Hosur, T.N.	Dr. T. N. Manohara, Sci- E, SFM Division; Mr. Venkatesh Murthy, MTS, SFM Division; Shri Raju Thomas, RFO
Day 4 (23.01.2020)		
10.00 AM to 11.30 AM	Clump management and harvesting of bamboos.	Dr. M. V. Durai, Sci- B, SFM Division
11.30 AM to 11.45 AM	Tea Break	
11.45 AM to 1.30 PM	Bamboo agro forestry & silviculture.	Dr. T.N. Manohara, Sci- E, SFM Division, IWST.
1.30 PM to 2.30 PM	Lunch break	
2.30 PM to 3.45 PM	Insect-Pest of Bamboo and its management in nursery and plantation.	Shri R. Raja Rishi, Sci- D, FP Division
3.45 PM to 4.00 PM	Tea break	
4.00 PM to 5.30 PM	Diseases problem in Bamboo and its management in nursery and plantation.	Dr. A. Muthu Kumar, Sci-D, FP Division
Day 5 (24.01.2020)		
10.00 AM to 11.30 AM	Role of Bamboo Society of India in popularizing bamboo amongst farmers.	Dr. K.S. Anand Bamboo Society of India, Karnataka chapter, Karnataka.
11.30 AM to 11.45 AM	Tea Break	
11.45 AM to 1.30 PM	Audio-Visual display related to Bamboo	Dr. T.N. Manohara. Sci- E, SFM division
1.30 PM to 2.30 PM	Lunch break	
2.30 PM to 3.45 PM	Policy related issues in Bamboo sector	Shri. Rajkumar Srivastava, IFS, State Bamboo Mission, Karnataka.
3.45 PM to 4.0 PM	Tea Break	
4.0 PM to 5.30 PM	Open discussion on way forward	Shri. Rajkumar Srivastava, IFS, Dr. T.N. Manohara, Sci-E
Day 6 (25-01-2020)		
10.00 AM to 11.30 AM	Interaction with participants and feedback from participants	Dr. T.N. Manohara, Sci –E, SFM Division Shri V Shettappanavar, IFS, Head, SFM Division
11.30 AM to 12.30 PM	Valedictory session	

Course Director: Dr. T. N. Manohara, Scientist E, SFM Division, IWST

(Dr. T.N. Manohara)
Course Director

The Training Programme was started with the inauguration by the Director, IWST on 20th January 2020.

Technical sessions				
Days	Date	Topics	Resource persons	Remarks
Day 1	20-01-2020	An overview of Bamboo.	Dr. T. N. Manohara, Sci- E, SFM Division.	Explained about the different species bamboo in India and World, its distribution, importance, work carried out and facility extended at IWST, Bengaluru.
		Visit to Xylarium	Mr. Sandeep Chakraborty, STA, SFM Division. Mr. Venkatesh Murthy, MTS, SFM Division.	Visited Xylarium and witnessed different wood samples; its significance from the point of identification of wood.
		Bamboo Genetic Recourses	Dr. T.N. Manohara SFM Division	Explained about distribution of different species of bamboo; collection and assemblage of bamboo in bamboo setum, significance from the point of source material for production QPM.
		Bamboo Propagation through tissue culture	Dr. Tresa Hamelton, Scientist B, Ms. Almas Khannum, STA, SFM Division.	Explained about micro propagation of bamboo, explants preparation, different types of media, stages in the micro propagation: callusing, induction of shoots and roots, somatic embryogenesis and factors influencing micro propagation. Explained about tissue culture laboratory facilities, requirements of chemicals & glassware, preparation of stock solutions, media, autoclaving, selection of explants and sterilization, inoculation, effect of plant growth regulators, stages in the micro propagation-axillary shoot proliferation, callus formation, somatic embryogenesis, shoot induction, rooting, stages of shoot multiplication and hardening of plantlets.
Day 2	21.01-2020	Bamboo Macro Propagation Techniques	Shri V. Shettapanavar, IFS, Head, SEM Division.	Explained about different species of bamboo, quality planting material and different methods of bamboo propagation etc.
		Bamboo Propagation Techniques and hands-on training at IWST Nursery	Shri V. Shettapanavar, IFS, Head, SEM Division; Mr. Sandeep Chakraborty, STA, SFM Division.	Hands on training were given to participants on bamboo propagation at IWST nursery.
		Visit to tissue culture laboratory, IWST.	Ms. Almas Khannum, STA, SFM Division.	Participants were exposed to Tissue culture laboratory, different equipments, procedures and showed different stages of cultures.
		Visit to museum and library, IWST	Mr.Sandeep Chakraborty, STA, SFM Division.	Participants witnessed different collections of Woods, insects, seeds, catalogues and rich literatures.
Day 3	22-01-2020	Visit to M/s Grow More Biotech, Hosur, T.N.	Dr. T. N. Manohara, Sci- E, SFM Division; Mr. Venkatesh Murthy, MTS, SFM Division. Shri Raju Thomas, RFO	Participants were visited to M/s Growmore Biotech Ltd. to understand and visualize the bamboo tissue culture and its importance. Witnessed mass multiplication (up to one lakh bamboos per day) of bamboo and its marketing to various countries across the world.
Day 4	23-01-2020	Clump management and harvesting of	Dr. M. V. Durai, Sci- B, SFM Division	Explained about the culm emergence, growth, and production; clump expansion

BTSG-ICFRE training on 'Bamboo Nursery and Management'

		bamboos		and mortality; effect of ecological conditions, topography, soil condition, temperature, light, rainfall, altitude on the growth of different bamboos, and discussed about scientific methods of clump management and harvesting of bamboos.
		Bamboo agro forestry & silviculture.	Dr. T.N. Manohara, Sci-E, SFM Division.	Explained about agroforestry and its significance to enhance income, bamboo as potential crop in different agroforestry system, yield and income generation, ecological and social values etc.
		Insect-pest of Bamboo and its management in nursery and plantation.	Shri R. Raja Rishi, Sci-D, FP Division.	Explained about Insect and pests of bamboos in nursery and plantations like Sap Feeders, Leaf Feeders, Shoot/ culm Borers, Root Feeders and its management; post-harvest pests in bamboo and its control.
		Disease problem in bamboo and its management in nursery and plantation.	Dr. A. Muthu Kumar, Sci-D, FP Division;	Explained about different diseases of Bamboos like, web blight, leaf rust, stunting and rotting of emerging culms etc and its control measures.
Day 5	24-01-2020	Role of Bamboo society of India in popularized bamboo amongst farmers.	Dr. K.S. Anand, Bamboo Society of India, Karnataka chapter, Karnataka.	Dr. K. S. Anand interacted with the participants and explained about importance of bamboo and the role of bamboo society in enhancing bamboo resource. Requested all the participants to be a part of bamboo society and contribute significantly to the growth of bamboo sector by growing bamboo and utilizing bamboo products. Use of VAM as cost effective biofertilizer for bamboo growth. Production of VAM for biofertilization.
		Audio-visual display related to Bamboo	Dr. T.N. Manohara, Sci-E, SFM Division, IWST.	Explained about bamboo, its propagation and multi facet uses of bamboo using audio-visual aids.
		Policy related issues in bamboo sector	Dr. Rajkumar Srivastava, IFS, State Bamboo Mission, Karnataka.	Highlighted the importance of bamboo in forests, wildlife and environment; different initiatives taken up by the Forest Department in North Karnataka towards cultivation and management of bamboo; creation of bamboo marketing avenues for future utilization etc.
		Open discussion on way forward	Shri. Rajkumar Srivastava, IFS, Dr. T.N. Manohara, Sci-E	Interacted with the formers about the growth of bamboo and its economic benefits and future prospects
Day - 6	25.01.2020	Interaction and Feedback from participants.	Dr. T.N. Manohara, Sci -E, SFM Division Shri V Shettappanavar, IFS, Head, SFM Division	Participants were provided their feedback gave valuable suggestions. Organizers noted t feedback.
		Valedictory function	Dr. T.N. Manohara, Sci -E, SFM Division Shri V Shettappanavar, IFS, Head, SFM Division	Valedictory function was held at Lecture hall of IWST, Bengaluru. During this session the participants shared their experience from the training programme; Certificates were issued to all the participants.

Details of the participants:

Sl. No.	Name	Date of Birth	Address	Aadhar Number	Contact Number	Category	Gender (M/ F)
1	Anandswamy	19/01/1984	C/o M. S. Hiremath Haldoor, Badami, Bagalkot, Karnataka -587203	783864517841	9880060944	General	Male
2	Arun S S	15/08/1989	S/o Shivananda Rao S. S Near Morarji Desai School Kondajji – Village, Harihara -Taluk , Davangere.- District Karnataka - 577589	923900389830	9008161124	General	Male
3	Balakrishna P R	25/05/1971	S/o Ranganna P V, 126, Shivanagara, Adivala, Dharmapura Hobli, Hiriyur Taluk, Chitradurga District. Karnataka – 577511	653456736829	8861724040	General	Male
4	Chetan B.O.	01/06/1991	S/o Omkarappa Bettadalli – Post, Tarikere- Taluk Chikmagalur -577218	338709722628	9741113727	General	Male
5	Chetan Raj Meda B.	12/01/1999	S/o Babu, 1-11-52/12/1, Maruti Nagar, Raichur Taluk & District Karnataka 584101	307237934831	8618016952	ST	Male
6	Divyashree P M	26/10/1997	D/o Madaiah P R Konanahalli Post, Mandya Taluk & District Karnataka – 571403	790780922389	9741543438	General	Female
7	Dr. Chandra Shekar A.	10/04/1963	S/o Adikeshavulu 17/3 5th cross, 6th block, Rajajinagar, Bangalore -560010	552004804102	9591470291	General	Male
8	Eshwarappa A. S.	25/04/1955	S/o Late Siddappa Amrtapur P.O., Amrtapur village, Tarikere Taluk, Chikmagalur- 577218.	570521038181	9449138120	General	Male
9	Gangadharappa K	12/08/1949	S/o Late Karibasappa Amrutapura- Post, Tarikere – Taluk, Chikmagalur- District . Karnataka – 577228	420422136686	7022899583	General	Male
10	Hanumanthaiah L.P.	01/06/1967	S/o Late Puttaiah Hanagavadi Post, Honnali Taluk, Davanagere District, Karnataka – 577243	611074696381	9980700615	General	Male

11	Kiran G.S.	19/08/1974	S/o Shantaveerappa G Basava Krupa, Bhadreshwara temple road Lower hutha, BH road, Bhadravati Karnataka – 577301	994290308389	9481211339	General	Male
12	Mallappa N	01/01/1971	S/o Nagappa Ashoka Nagara 1, Yadehalli Post, Bhadravati Taluk, Shimoga District, Karnataka – 577227	200829959385	9972668469	SC	Male
13	Mallesh Rao Chavan K S	04/02/1964	S/o Siddojirao, #29, Doddabeerappa Street, PalaceRoad, Jayamahall, Bangalore North, Bangalore, Karnataka - 560006	744121015674	9448240692	General	Male
14	Nanjappa H.M.	05/06/1957	S/o Mallappa H.N 4 th parallel road, Durgigudi, Shimoga, Karnataka - 577201.	717311287871	8147375849, 9242829142	General	Male
15	Parameshwarappa C.	05/02/1961	S/o Late Chandraskar K.M Karkipet, Jyothinagar post, Chikmagalur-577102	918957591134	9353391991, 9483325961	General	Male
16	Parutappa Beli	05/04/1947	S/o KallappaBeli H4-601/66B/18, Santraswadi Road, First Left Cross, M B Nagar, Gulbarga- 585105	224199338268	9886745582, 9538111523	OBC	Male
17	Pooja Patel P	28/11/1994	D/o C Parameshwarappa 2nd Cross, Water tank road Gowri kaluve, Chikmagalur Karnataka - 577101	214168076825	7829196361	General	Female
18	Praveen Kumar	01/12/1997	S/o R. Narasimhalu 12-9-66 Hosa Medaravadi, Siya Talab, Raichur – Post, Karnataka - 584101	663993595806	8151958025	ST	Male
19	Praveena K S	03/01/1984	D/o Shivappa Keladi #180/1, Ambapura Village Sagar -Taluk, Shimoga- District Karnataka – 577401	435631534266	9902257777	OBC	Male
20	Shadaksharappa D. S.	25/11/1954	S/o Sidappa Dornalu post, Dornalu, Tarikere, Chikmagalur- 577218	388562016288	9482120500	General	Male

21	Shankara Gouda C Gangana Goudra	01/06/1961	S/o Chandrashekar Gouda Mudenur village, Ranibennur Taluk, Haveri District, Karnataka- 581123	248564775668	9740351173	General	Male
22	Shivashankarappa K.N.	12/06/1962	S/o Lingappa Kalkere, Ajjampura Taluk, Chickmagalur – District, Karnataka - 577180	823926046101	9449180630, 9731950480	General	Male
23	Sunita S Ganganagoudra	17/05/1971	D/o Chayappagouda Mudenoor - village, Ranibennur Taluk, Haveri – 581124.	203604774026	8762147104	General	Female
24	Vasappa . B	12/07/1954	S/o Late Govindappa #81, 7th cross BFW layout, Laggere Bengaluru Karnataka- 560058	597093240641	9845272979	ST	Male
25	Vijayaraj Meda Babu	10/03/1995	S/o Babu Raichur 1-11-52/12/1, Maruthi Nagar, Near Vidhyabharathi School, Raichur -584101.	202772000261	7975747103, 9945501112	ST	Male

Participants of the training programme:



Anandswamy



Arun S.S.



Balakrishna P.R.



Chethan B.O.



Chethan Raj Meda B.



Pooja Patel P



Dr. Chandrashekar A.



Eshwarappa A.S.



Gangadharappa K.



Hanumanthaiah L.P.



Kiran G.S.



Mallappa N.



Mallesh Rao Chavan K.S.



Nanjappa H.M



Parameshwarappa C.



Parutappa Beli



Divyashree P.M.



Praveen Kumar



Praveena K.S.



Shadaksharappa D.S.



Shankara Gouda C.G.



Shivashankarappa K.N.



Sunita S. Ganganagoudra



Vasappa B.



Vijayaraj Meda Babu

Glimpses of the BTSG- ICFRE sponsored training programme on 'Bamboo Nursery Management'

Inaugural session on 20-01-2020



Inaugural session of the training programme



Gallery of participants during inaugural session

**Technical sessions
(20-01-2020 to 25-01-2020)**



Overview of bamboo by Dr. T.N. Manohara



Talk on Bamboo propagation by Shri V. Shettappanavar IFS



Talk on bamboo clump management by Dr. M. V. Durai



Shri A.C. Lakshman IFS addressing participants



Talk on Insect-pest management by Shri R. Raja Rishi



Prof. (Dr.) Chidanand addressing farmers on future prospects of bamboo

Practical sessions and Field visits



Demonstration on macropropagation of bamboo by Mr. Sandeep Chakraborty



Demonstration on macropropagation of bamboo by Mr. Sandeep Chakraborty



Orientation on micropropagation of bamboo by Ms. Almas Khannum



Explaining about tissue culture technique for mass multiplication of bamboo by Dr. Barathi, Director, Growmore Biotech Ltd.



Visit to Wood museum



Visit to AWTC, IWST, BENGALURU

Valedictory session on 25-01-2020



Dignitaries for Valedictory session



Feedback by participants



Certificate distribution to the participants by Dr. T.N. Manohara, Shri V. Shettappanavar and Dr. H.S. Suresh, IISc. Bengaluru

Acknowledgements

The support of DDG (Research), Shri. S.D. Sharma and ADG (RP) Dr. Vimal Kotiyal is gratefully acknowledged. The encouragement and support of Dr. M.P. Singh, IFS, Director, IWST and Dr. V.P. Tewari, Sci- G, GCR, IWST is also gratefully acknowledged. The support and encouragement rendered by Shri V. Shettappanavar, IFS, Head, Silviculture and Forest Management Division is also gratefully acknowledged. The contribution of resource persons from IWST and others outside organizations are also acknowledged. The assistance and help rendered by various scientists and staffs of IWST are also acknowledged. We also thank all the 25 participants for the whole hearted co-operation and deep involvement during the training programme.

Dr. T. N. Manohara
Sci- E, SFM Division &
Course Director

