

TRAINING REPORT ON CAPACITY BUILDING PROGRAM

SUBMITTED TO:



Government of India
NEC

**NORTH EASTERN COUNCIL(NEC)
SHILLONG**

SUBMITTED BY:



CANE AND BAMBOO TECHNOLOGY CENTRE

CANE AND BAMBOO TECHNOLOGY PARK

(Near Central Academy for State Forest Service)

13th MILE, G.S.ROAD, BURNIHAT, GUWAHATI – 783101, ASSAM, INDIA

Email: cbtcassam@gmail.com

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The Cane & Bamboo Technology Centre (CBTC) was formed in 2000 as part of Cane and Bamboo Technological Upgradation and Networking Programme of United Nations Development Programme (UNDP). The programme also involved the Department of Science & Technology (DST), Govt. of India and United Nations Industrial Development Organization (UNIDO).

After completion of UNDP project in 2004, CBTC was registered under the Societies Registration Act, 1860. The members of the society are Secretary, NEC, Mission Director, NBM, Adviser (Planning), NEC, Adviser (E&F), NEC, Financial Adviser, NEC, State Mission Directors, SBM of the 8 States of the North Eastern Region, Representative of Bamboo Grower, and Representative of Bamboo Processing Industries of NER.

Today, CBTC is one of the premier organizations in India working towards promotion of cane and bamboo technology in the North East Region and is playing a vital role in promoting bamboo as one of the prime natural material for the development of economy, generation of employment and protection of environment in this region. CBTC is a nodal institution for bamboo technology and skills development. The institution has been offering technology development services in the region through consultancy and training courses to industries/entrepreneurs and other groups. CBTC is also the implementing agency for the North East Regional Bamboo Mission (NERBaM), launched by the North Eastern Council (NEC).

Core Competencies of CBTC

- A hub for information and technologies for project partners and stakeholders.
- A link for specialized institutions in India and abroad to strengthen existing institutions by enhancing their networking capacities.
- A vehicle for multi-disciplinary approach from handicrafts to hi-tech applications of cane and bamboo - housing, floorings, furniture, panels, wooden frames, veneers and boards.
- Manpower development and Training - A training institution for craftsperson, entrepreneurs and trainers.
- A coordinator for technical, legal and economic policies to increase the uses and trade in cane and bamboo at national and international levels.
- A catalyst to promote economic development using cane and bamboo as a prime resource.
- Facilitating Technology Transfer
- Providing Consultancy to Small & Medium Entrepreneurs
- Resource Centre for information on Cane and bamboo, Cane and bamboo Crafts, Cane and bamboo Industrial products etc.
- Design Centre for new and innovative Bamboo & Cane Handicrafts items

CBTC as a BTSG under National Bamboo Mission

CBTC is appointed as the Bamboo Technical Support Group (BTSG) for the entire North Eastern Region including Eastern States of West Bengal, Orissa, Bihar and Jharkhand.

The Department of Agriculture & Co-operation under Ministry of Agriculture, Govt. of India has launched the “National Bamboo Mission” (NBM) for addressing the issues relating to the development of bamboo in the country. The National Bamboo Mission is a 100% Centrally Sponsored Scheme and the outlay under the mission for the Xth & XIth Plan period is Rs. 568.23 Crore. The National Bamboo Mission is being implemented in almost all the states of the country including all the eight North Eastern States.

In order to technically support the National Bamboo Mission, four Zonal Bamboo Technical Support Groups (BTSG) have been identified and CBTC, Guwahati has been designated as BTSG for all the eight North Eastern states of Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura along with four eastern states of India – Bihar, Jharkhand, Orissa and West Bengal.

Core Purposes of the BTSGs

- To assist the NBM in implementing the Mission Activities as per schedule in the field level.
- To plan and frame strategies for implementation of the Mission Objectives in respective states.
- To disseminate the technical knowledge to the respective states for effective implementation.
- To achieve the Mission Benefits as projected.

Major Role and Functions of a BTSG:

- To visit the concerned states frequently and provide guidance in policy, organizational and technical matters
- To compile materials for conduct of regional workshops on bamboo plantations, handicraft, bamboo marketing and exports
- To conduct studies on different aspects of bamboo
- To assist the states in capacity building programmes
- Undertake publicity campaigns to promote the Mission Objectives
- To document and disseminate case studies of success stories
- To conduct specialized Training Programmes at the regional level
- To network with various stakeholders and Institutes/ Organizations/ Agencies, both in India and abroad

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BAMBOO VALUE ADDED PRODUCTS AND ITS APPLICATION



Bamboo can be processed into different products that are suitable for various applications. Right from raw bamboo poles to the wastes generated during processing of bamboo is utilized for value added products. The rhizome is used to curve pictures, the bottom portion of some selected species is used for converting to flooring and lumber, the middle portion is used for converting to various primary as well as secondary processed products like slivers, sticks, window blinds and the like.

The top most portion can be used as brooms or by the paper mills including the branches. The leaves are used for making traditional medicines, bear, etc. For instance, it is being used

- as food
- as a wood substitute
- as a building and construction material
- for handicrafts
- in tiny and cottage industries
- as a medicinal product



There are numerous other bamboo-based value-added products such as moulded decorative items, baseballs, bicycles, beehives, containers, surf boards, which have not been considered because market acceptance for these is yet in a nascent stage. There is no wastage of any part of bamboo.

Competitiveness: Resource Utilisation

3 Main Sub-Sectors

Handicraft

**Industrial
Processing**

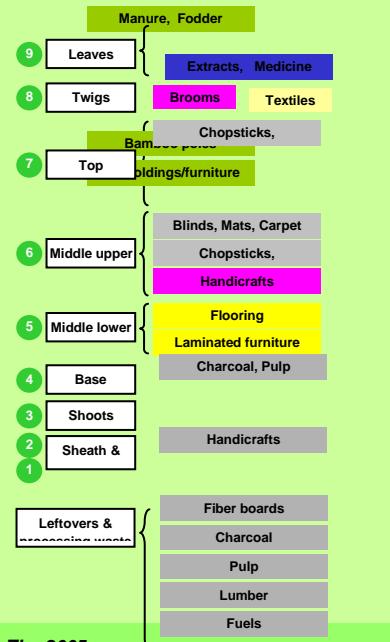
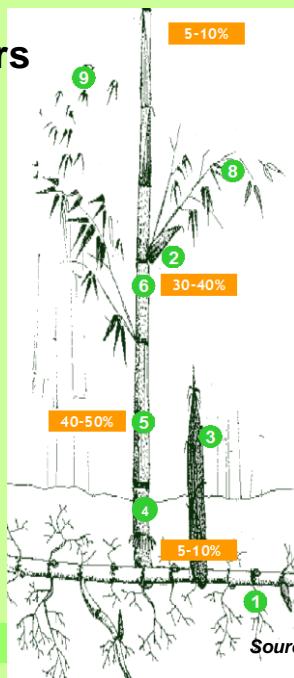
Raw Culms

Bulk Products

Medium Value

Premium

**Other
Developing**



Source: Zhu 2005

Round Bamboo: The bamboo culms are utilized in the round form, by sizing to the required length for housing, scaffolding, ladders, furniture, by the paper mills, and the like.

Value-added Products from Rounds

Rounds can be used in scaffolding, as props, for making bamboo veneer and also for making a truss system in house construction.

Bamboo Splints: Round bamboo is split into strips and is made round either by machines or manually. Manually made round sticks are used in making handicraft items, incense sticks, blinds, ice cream sticks, etc. Similarly machine made round sticks of various diameters are also used for making handicraft items, incense sticks, tooth picks, chop sticks, blinds, ice cream and flower sticks, match sticks and the like.

Splints produced on a large scale can be used to weave mats, bedcovers and blinds.

Bamboo Slivers: Bamboo slivers are generally of 0.8 mm to 1.5 mm thickness and 20 mm breadth. These are either machine made or handmade. These slivers are generally used for making mats by weaving manually. A typical 8' x 4' mat costs around Rs. 30-40 and are used by the consumers for various purposes. Mats are also used as walls in rural housing. Of now, these mats are in great demand for industrial use for processing into Bamboo Mat Boards (BMB), Bamboo Mat Corrugated Sheets (BMCS), Sliver Boards(SB), etc.

Slivers have a variety of uses ranging from making mats, for paper pulp, in the board industry, for making furniture and for making bamboo grids for roads. Large-scale sliver-making operations would therefore be viable.

Bamboo Strips: Bamboo strips are generally 5 mm or more in thickness and width is 22 mm. These strips are again either made manually or by machines. Manually made strips are used for making fences, used in construction of house walls, partition walls, weaving blinds, handicrafts and the like.



Machine made strips are used for making various bamboo based panels like flooring, ceilings, lumbars, etc. Bamboo based floorings are getting wide acceptance in Europe and North America as an replacement of conventional wood tiles. There are various reasons like better look because of the visibility of the grains giving a natural look, environment friendly as this preserves precious woods like red oak or maple, dimensionally more stable and stronger, cost economics is reasonable. Similarly, bamboo lumber is also finding greater market for making furniture and other joints.

The strips are also used as reinforcement grids in constructing roads. In the developed countries, they use plastic based grids for constructing roads which are costly. For developing countries like India, such use of bamboo grids can enhance the life of roads by one to two time than with out grids.

Other Bamboo Based Products: Some of the newly developed bamboo products are :

BAMBOO MOULDED FURNITURE

Bamboo is one of the most beautiful, long-lasting, environmentally friendly and unique products in the market today. Every day more people are discovering the seemingly endless benefits of bamboo molding because of its durability, stability, exotic appearance and environmentally friendly nature.

Pre-finished bamboo molding has many enduring qualities:

- Furniture will be applied multi-coat Poly Urethane (PU) finish
- Easy to maintain and clean—never needs waxing
- Lifetime structure/ 10-year finish warranty
- Natural, elegant and beautiful
- Ecologically friendly
- Easy to Handle
- Competitively priced than other wood products
- 25% harder than Red Oak, 12% harder than Rock Maple
- More dimensionally stable than commonly used wood, including oak and maple



Bamboo in Housing & Construction

Bamboo is an integral part in all spheres of life such as social, cultural and tradition. Besides traditional household uses, Bamboo has been a basic material for building construction since aged old. There are more than 75% of the rural habitats built with Bamboo in this region. In fact, Bamboo in housing would be the biggest sector commonly practiced as a whole. Therefore, Bamboo housing offers an enough scope to the local populace towards the employment generation in a large scale as well as adaptation of the technology while looking at the abundant resource and the existing traditional skills.

Since times immemorial, the general trend of practicing in bamboo construction has been traditional; beyond that, much change and development could not evolve to a large extend. Moreover now, due to the advent of new building materials and industrialization, bamboo has become the least used material amongst the rural and local people.

Beyond the above facts, bamboo has also to offer other advantages as a building material. Bamboo as a material is very light and has a high tensile strength for which the construction with bamboo is much relevant in the areas falling under earth quake zones like North-East India. Also, with the advent of new technology Bamboo has become an alternative material to wood thereby substituting the rapidly depleting wood resources. Altogether, Bamboo is not merely a material for construction but also sustains the local economy in the process, balances our environment and generates local employment.

Objective of the Training Programme :

The main objectives of the Training Proposal are:

- To create awareness about the importance of Bamboo towards sustainable socio economic development
- To create human resources on different bamboo trade
- To generate sustainable employment through backward & forward integration of rural bamboo based enterprise development thereby increasing the income of the households of the rural poor
- Exposure of hand practice of hand operated semi-mechanized machine, power operated machines, improvised hand tools and kits for bamboo craft work.
- Mass production of craft items in the form of assembly line approach and also by using new techniques like moulds, Jigs, fixture etc.
- To capacitate the artisans and craftsmen for self employment
- To enhance the capabilities of the rural poor to manage new technologies and institutions at village level
- To add value on bamboo through production of different value added products
- To create awareness among the rural people about the importance and usefulness of bamboo beyond traditional uses for all practical purposes

SELECTION PROCESS OF THE PARTICIPANTS/TRAINEES:

Advertisement had been given in regional news paper in NE states for inviting application from the prospective candidates for the proposed training programme. All State Bamboo Mission Director of NE, Director of Industry were also communicated to nominate participants.

WEDNESDAY, MAY. 6, 2015.

THE ASSAM TRIBUNE, GUWAHATI 11



Training on Capacity Building in Bamboo Trade & Technology (May, 2015 to July, 2015)

Organized by:

CANE AND BAMBOO TECHNOLOGY CENTRE, Burnihat, Assam

Venue:

Cane and Bamboo Technology Park, Burnihat, Assam

Sponsored By:

North Eastern Council (NEC), Shillong, Ministry of DoNER, Govt. of India

Qualification:

Class-VIII passed (Preference will be given to Class-X passed)

Fees: Nil Fooding & Lodging: Free

Travelling: To and fro travel by sleeper class train or by Bus from place of domicile will be reimbursed on producing tickets in original with maximum limit of Rs. 3000.00 (Three Thousand)

No. of candidates: 3 (three) in each batch from each state of NE region including Sikkim.

Sl. No.	Course Name	Date of Training	Duration	Venue
1	Training on innovative Bamboo Handicraft & furniture making	18th May to 16th June, 2015	1 month	CBTP, Burnihat
2	Awareness Work shop on "Bamboo products & its application"	Dates to be fixed after consultation with selected NGOs *	One day	Bamboo growing area, in each state in NE region
3	Training on innovative Bamboo Housing & construction	22nd June to 21st July, 2015	1 month	CBTP, Burnihat

Interested candidates may contact / submit application to Director, Dept. of Industries or Mission Director / Team Leader, State Bamboo Mission of respective states.

* Reputed registered NGOs / Trusts / Societies from NE states including Sikkim are invited to apply for conducting one day Awareness Workshop in respective states. For further information please contact Dy. Manager Training, CBTC, Burnihat, Assam, Mobile No. +91-9864139177, Email: h.priyokumar@gmail.com and Email: cbtcassam@gmail.com

Sd/-

(Gautam Chintey)

CD/Edu/9085/1 I/c Secretary, CBTC and Adviser (BIT), NEC

**SUMMARY OF TRAINING PROGRAMME CONDUCTED BY CBTC UNDER NEC CAPACITY
BUILDING PROGRAMME FOR THE YEAR 2014-2015**

Sl No	Name of the Training	Duration of training	Date	Male participants	Female participants	Total
1	Training on innovative Bamboo Handicrafts & furniture Making 18th May, 2015 to 16th June, 2015	1 month	18th May, 2015 to 16th June, 2015	25	1	26
2	Awareness Works on "Bamboo Products & its Application at Gohpur, Assam	1 day	18th June, 2015	45	23	68
3	Awareness Works at Namchi, Sikkim	1 day	25th June, 2015	39	26	65
4	Awareness Works in Manipur	1 day	28th June, 15	35	27	62
5	Awareness Works at Jote, Arunachal Pradesh	1 day	14th July	40	12	52
6	Awareness Works at Dharmanagar, Tripura	1 day	17th July, 15	28	32	60
7	Awareness Works at Lunglei, Mizoram	1 day	21st July, 15	30	31	61
8	Awareness Works at Ri-Bhoi-Dist, Meghalaya	1 day	4th August, 15	53	41	94
9	Awareness Works at Mokokchong, Nagaland	1 day	7th August, 2015	32	28	60
10	Prototype Development on Cane & Bamboo Handicraft	3 months	May-July, 2015	12		12

Awareness workshop on “Bamboo Products & its application”

Courses contain:

- Various species available in India and North Eastern State
- About National Bamboo Mission and its activities
- Various methods on Bamboo Nursery raising and plantation
- Profitability from Bamboo Plantation
- Traditional and modern utilization of bamboo
- Demonstrated of Bamboo Industrial Products
- Market prospect of Bamboo products
- Various techniques for bamboo treatment and preservation

All awareness workshops were organized in collaboration with reputed NGO and respective Government Department. Training reports are attached.

Awareness Workshop at Chaiduar Block Gahopur Sub-Division:-
On date:- 18th –June, 2015



**President of Word, Principal of Chaidur College and
The Chief Guest Formar M.P.Shri jut Ram Sharma
Dev**

Banner of the NGO. (WORD)



**All the Participants from the Gahopur Sub-
Division, Sonitpur , ASSAM.**

**Bamboo Products Display by CBTC, Guwahati,
ASSAM**



All the Participants from the Gahopur Sub-Division,

Bamboo Products Display by local artisan, Gahopur



A Power Point Presentation on Bamboo Products

By Sri Pulok kr Mandal.(Asst. Manager CBTC)



A Power Point Presentation on Treatment of Bamboo

By Sri Priyo kr Singh (Dy. Manager CBTC)



A Power Point Presentation on Bamboo Housing

By Sri Anjal Goswami (Dy. Manager CBTC)



A Speech of The Chief Guest ,Formar M.P.Shri jut Ram Sharma Dev.



Distribution of Certificates to the Participants By
Chief Guest ,Former M.P.Shri jut Ram Sharma Dev.



Distribution of Certificates to the Participants By
Chief Guest ,Former M.P.Shri jut Ram Sharma Dev.



**A Speech of The Principal of Chaidur
College, Gahopur**



**Participants from the Gahopur Sub-Division,
Chaidur College**



**Participants from the Gahopur Sub-Division,
Chaidur College**



Group Photo of the Organization and CBTC Team



**Distribution of Certificates to the Participants By
Chief Guest ,Former M.P.Shri jut Ram Sharma Dev.**



**Closing Speech By Sri Jut Nagen Gogoi, the President
of WORD and Chief Guest , Shri jut Ram Sharma
Dev.**



Welfare Organization & Rural Development (WORD)

Regd. No. RS/KAM(M)/263/J/47 of 2015-2016

House No.-4, SBI Colony, Sarumataria, P.O. & P.S.- Dispur,

Dist. - Kamrup (Assam), Guwahati-6

Branch Office : Bhagyalaxmi, Ghahigaon, Sonitpur, Assam, 784170.

Ph.: +919508569540 E-mail : wordpranjal@gmail.com

Ref: 002

Date: 26/05/2015

To

The I/C Secretary, CBTC and Adviser(BIT) NEC
Cane and Bamboo Technology Centre,
13th mile, C.S. Road, Burnihat, Assam.

**Sub :- Request for Organizing a Awareness workshop at Chaidur Block, Gohpur Dist.
Sonitpur, (Assam).**

Dear Sir,

In Response to your advertizement at the Assam Tribune for Bamboo Awareness workshop.

So, we would like inform you that the Gohpur SDO (Civil) tell us to Organize a Bamboo training programme with your kind organization (CBTC) for the upliftment for the Rural people of chaidur Block.

As because, the Bamboo Resource are plenty at chaidur Sub-Division, Gohpur area.

So, It will be very helpful if provide a Bamboo training programme for rural people of Gohpur.

With regards



Copy to :

SDO (Civil) Gohpur Sub-Division, Govt. of Assam.

Yours Sincerely

President, Welfare Organization & Rural Development

Sri Nogen Gogoi

President, "WORD"

Contact: 918724994079

REPORT ON WORKSHOP ON "BAMBOO APPLICATION AND TECHNOLOGY"

ORGANIZED BY: DRISHTI, NAMCHI IN COLLABORATION WITH CANE AND BAMBOO TECHNOLOGY CENTRE (CBTC), GUWAHATI, ASSAM.

SPONSORED BY: NORTH EASTERN COUNCIL, SHILONG, MEGHALAYA

VENUE: CONFERENCE HALL, DAC, NAMCHI.

DATE: 25/06/2016

Drishti, in collaboration with Cane and Bamboo Technology Centre Guwahati, organized one day workshop on Bamboo Application and Technology at DAC Namchi, Sponsored by North Eastern Council, Shillong Meghalaya. The workshop was organized on 25/06/2015.

The Cane and Bamboo Technology Centre (CBTC), Guwahati, with supported by the Department Of Science And Technology, Government of India. Its main aim is to identify and promote bamboo technology to enhance income and employment in North East region with available resource. It provides training and provides access to improve technology.



Mr. Bimal Chandra Rai, Sub Divisional Magistrate (SDM), graced the ceremony as the Chief Guest of the programme. Officials and staff from the Horticulture Department, Labor Department and other line Departments were present along with Mr Bijay Kumar Rai, Additional Director (South), Horticulture Department.

There were three eminent resource persons from CBTC.

1. Mr. Anjal Kumar Goswami, Deputy Manager, Housing CBTC.
2. Mr. Pulak Kumar Mandal, Assistant Manager, Training CBTC.
3. Mr. HPK Singh, Deputy Manager, Training CBTC.

They took the various sessions of the workshop.

Along with this, the President of Drishti, Mr. Bhaskar Rai, General Secretary of Drishti, Mr. Passang Tshering Bhutia and all the members and staff Of Drishti were present.

All together 65 participants attended the workshop from Namchi and its vicinity.

Training on “Innovative Bamboo Handicraft & Furniture Making”

Duration of Training: One month

Training Content:

The Training module was included the following topics

- Bamboo Policy and its implementation in India through the National Bamboo Mission ;
- Relevant species of bamboo which is better for making Furniture and innovative basket.
- Raw material processing (treatment and preservation), - Primary Processing.
- Types of tools and equipments used for Furniture and weaving.
- Maintains of hand tools and equipments.
- Different type of weaving patterns for making basketries..
- Techniques for making different furniture.
- Finishing techniques
- Techniques to perform chemicals and vegetative dyeing on Cane and Bamboo.
- Side Visit to Factories & Clusters.

Training Details of “Innovative Bamboo Handicraft & Furniture Making”

- 1. Name of Training : Innovative Bamboo Handicraft & Furniture Making”**
- 2. Date of Training : 18th May 2015 to 16th June 2015**
- 3. Duration of the Training : One month**
- 4. Venue : CBTC, Bamboo Technology Park (BTP), Burnihat, Assam**
- 5. Organized By : CBTC, Bamboo Technology Park (BTP), Burnihat, Assam**
- 6. Sponsoring agency : NEC, Shillong**
- 7. Total participants (Male & female): 26 (Male : 25 & Female:1)**
- 8. Background of Trainees: The trainees were mainly from all the North Eastern States including Sikkim. They are nominated by respective State Government Departments like Industries, Forest Department, State Bamboo Mission, Bamboo Development Agency and also nominated from various NGOs etc.**

Course Details:

Date	Name of the course/topic	Time
	1 ST Week	
1 st Day	Registration and inaugural function Bamboo Trade and your role and future duties (c) Introduction to traditional and modern uses of bamboo, Different species of bamboo and their usability.	11am to 12pm 12pm to 1pm 2 pm to 4 pm
2 nd Day	(a) Demonstration of Knowledge about HIV infection & AIDS, (b) Safety and accident preventive practice in a bamboo Processing workplace(shock, bleeding, burns, fractures, injures)	10am to 1pm 2pm to 4pm
3 rd Day	Theory section on various treatment process & (Practice Section) Raw materials preparation for the treatment on bamboo	10am to 4pm
4 th Day	(a)Introduction to Various hand tools & machine tools, Practice session with tools	10am to 4pm
5 th Day	Vegetative propagation of bamboo and plantation of high yield bamboo with intensive management & practice section Preparation of Raw materials for making weaving & practice session on weaving.	10am to 4pm

6 th Day	Practice on various weaving methods	10 am to 4pm
	2 nd Week	
7 th day	Describe & Perform Measurement and Freehand Drawings Practice session on Drawing	10am to 4pm
8 th Day	Practice on Furniture and weaving Techniques. Practice on Chemical & Natural dyeing method on Bamboo	10am to 4pm
9 th Day	Practice on Furniture making, small handicraft and hand tools continue.	10am to 4pm
10 th Day	Practice session continues	10am to 4pm
11 th Day	Practice on moulded furniture making	10am to 4pm
12 th Day	Continues	10am to 1pm
	3 rd Week	
13 th Day	Practice session on Weaving. Practice session on making various innovative handicraft items	10am to 4pm
14 th Day	Practice session Continue	10am to 4 pm
15 th Day	Practice session continue	10 am to 4 pm

16 th Day	Practice session Continue	10am to 4pm
17 th Day	Practice session Continue	10am to 4pm
18 th Day	Practice session on continue	10am to 1pm
	4 th Week	
19 th Day	Practice session on Primary Processing Machines	10am to 4pm
20 th Day	Practice session Continue	10am to 4pm
21st Day	Field Visit to Furniture Industries	10am to 4pm
22nd Day	Practice session on Finishing touch	10am to 4pm
23rd Day	Continue	10am-4pm
24 th Day	Continue	10am to 4pm
25 th Day	Final Touch of finishing	10am to 4pm
26 th Day	Closing Ceremony & certificate distribution	2 pm
Course contain in details		

	Trade Practical		Trade Theory	
Sl. No.	Topics	Hours	Topics	Hours
		25		

1	<p>Utilization of Bamboo</p> <ul style="list-style-type: none"> • Demonstration of different bamboo item, its modern utilization by showing visual aids • Demonstration through field visit and Nursery Practice 	4	<ul style="list-style-type: none"> • Anatomy of Bamboo & History of bamboo utilization. • Traditional and modern utilization of Bamboo. Various bamboo species available in India • Knowledge of various Bamboo cultivation Techniques, type of propagation methods practice in India. 	2
2	<p>Treatment & Preservation of Bamboo including dyeing</p> <ul style="list-style-type: none"> • Traditional practice on Bamboo Treatment • Practice on Chemical Treatment • Practice on Smoke Treatment • Practice of dyeing utilizing various chemical & vegetative dyes. 	8	<ul style="list-style-type: none"> • Various techniques of Treatment Preservation & Seasoning of Bamboo(Through ancient/traditional and modern methods) • Colouring/Dyeing of Bamboo strips/ slivers/bamboo pole. 	2
3	<p>Application of Tools</p> <ul style="list-style-type: none"> • Safe practice on various hand tools like hammer, chisel, dao, file, planner, hand saw etc. • Safe practice on different machine tools, like Drill, portable sander, jig saw, sabre saw etc. 	4	<ul style="list-style-type: none"> • Description of various hand tools and machine tools used on Bamboo technology, • Identify the various parts of tools and its application in practical field 	2
4	<p>Drawing of products</p> <ul style="list-style-type: none"> • Practice on free hand drawing of various handicraft items • Practice on Drawing of various gift items, stationery Item <p>Free hand drawing of various furniture</p>	20	<ul style="list-style-type: none"> • Practice of free hand sketching of circle & arcs • Uses of drawing instrument • Drawing various line with setsquare • Practice on drawing of conventional lines • What is Design? • Free hand drawing of various items • Construction of triangle, quadrilaterals, polygons • Lettering practice 	2
4	<p>Joints</p> <p>Practice on tongue and joint, Practice on Butt Joint. Practice on Overlapping joint, Practice on Horizontal joint,</p>	8	<ul style="list-style-type: none"> • Description of various joint and its uses in different section like furniture, Handicraft & Houshing etc. 	2
5	<p>Bending of Bamboo</p> <p>Safe practice of Bending bamboo strips, Slivers & bamboo pole using blow lamp. Make natural black colour on surface of bamboo pole by blow lamp.</p>	8	<ul style="list-style-type: none"> • Different parts of Blow Lamp. • Application of blow lamp in Bamboo activities. • Various process of bending. 	2

6	Operation of Cane & Bamboo Processing Machine <ul style="list-style-type: none"> Practice of Cross Cutting machine, Splitting machine, Stick making Machines ,Two side planning machine etc. oiling and lubrication of machine Cut bamboo as per desire length Practice on sharpening the saw blade Practice on different primary processing machineries	20	<ul style="list-style-type: none"> Brief description of cross cutting machine and how to operate, trouble shooting of this machines Introduction of Bamboo Primary processing Machineries and its uses 	2
7	Types of Furniture <ul style="list-style-type: none"> Free hand drawing of various bamboo furniture Demo of various type of furniture, Uses of cane in joineries of bamboo furniture 	6	<ul style="list-style-type: none"> Identification of various furniture such as Round Bamboo Furniture, Folded Bamboo Furniture, Moulded Bamboo Furniture, Split Bamboo Furniture etc Describe the advantages of various furniture Various techniques uses to make furniture Identify various tools & Machines used to make furniture	4
8	Materials of Furniture Demonstration of different material used in Furniture making	4	Use of Jigs& fixture to make uniform size & reduce production cost. Bamboo, Cane, Wood, Nail, Adhesive, Binding wire, Plastic Rope, Nut-bolt etc.	4
9	Techniques and Furniture making & Handicraft items Practice of furniture making <ol style="list-style-type: none"> 1. Sofa set 2. Chair 3. Molded Bamboo Chair 4. Lamp shades 5. Pen stand/Ash tray/small items 	60	Various joineries used in furniture making process Various joineries & it's application in Furniture making process	4
10	Exposure trip to local industry & marketing centre	8	Feed back of Exposure trip	4

Activities in Picture



Practice of slivering by hand



Raw material preparation for furniture



Assembling for furniture



practice of weaving



Make slivers for weaving



Practice on Two Side Planning Machine



Practice for making Furniture



Practice on Coil Techniques



Process for make stick for Agarbatti



Practice on Radial Splitting Machine



Theory class on Bamboo Treatment & Preservation



Preparation of Stick



Stick for making Window Blind



Practice on Moulded Bamboo Furniture





Assembling of Bamboo Moulded Furniture



Spray finishing on products



Final Finishing on Bamboo Products



Field visit to Industry & shopping centre



Final Products after finishing



Final Products after finishing



Group Photo after completion of Training programme

Prototype Development on “Cane and Bamboo”

A **prototype** is the first full-scale and usually functional form of a new design.

Why Prototype?

- 1. Fail early and inexpensively** – making new products always includes a risk of failure. By building a prototype, one can quickly change the designs that don't work and focus on the ones that do.
- 2. Gather more accurate requirements** – By developing a working prototype, one can demonstrate the functionality to help solidify requirements for the final design and production process for making it commercially viable.
- 3. Technically understand the problem** – By developing a functional prototype, one can address both the foreseen and the unforeseen technical challenges of a device's design. It will help to apply those solutions for a more elegant product design when making the final product
- 4. Resolve conflicts** – Inevitably, differences of opinion result in conflicts and these conflicts can be difficult to resolve because designers have only opinions, experience, and conjecture to refer to as evidence. By taking advantage of a prototyping platform, one can quickly conduct several different implementations of the feature and benchmark the resulting performance to analyze the trade-offs of each approach. This can save time, but it also ensures that you make the correct design decisions.

Prototypes provide the means for examining design problems and evaluating solutions. Selecting the focus of a prototype is the art of identifying the most important open design questions.

Products made:

- New mould for bamboo Moulded Furniture
- New designed lamp sheds
- Various Bamboo Moulded Furniture
- Coil Bamboo Products
- Bamboo Foldable Furniture
- Bamboo Watch
- Innovative Dinning Set
- Trolley for movement
- Stand for keeping bamboo stick & strips



Mechanized Mould for making furniture

**Mould for making
U shame for
furniture**





Lamp shades made in use coil techniques process



Lamp shades use coil & weaving technique





Lamp after lighting



Lamp after lighting



Lamp after lighting



Lamp after lighting



Lamp after lighting



Lamp after lighting



Bamboo Flower base (use coil techniques)



Clock made by Bamboo Slivers



Trolley for carrying bamboo strips & stick



Trolley for drying incense stick



Stand for keep bamboo strips



Stand for keep bamboo Stick