Dear Readers,

Bamboo Primary Processing in Kerala: A Panacea for Rural Employment

Kerala is a state in India where bamboo is abundantly available. The bamboo industry in Kerala has been growing rapidly due to the initiatives taken by the Government and various organizations. Bamboo is a versatile material that can be used in various applications ranging from construction to furniture. However, the processing of bamboo is a complex and labor-intensive process. The traditional methods of processing bamboo have been in practice for centuries, but new technologies and methods are being developed to make the process more efficient and sustainable.

The bamboo industry in Kerala is facing a lot of challenges, including the need for better processing techniques, improved infrastructure, and increased awareness among the local population about the benefits of using bamboo. The state government has identified the bamboo industry as a priority sector and has implemented several schemes to promote bamboo-based industries.

In conclusion, the bamboo industry in Kerala has immense potential for growth and development. With the right policies, initiatives, and support, the bamboo industry can become a significant contributor to the state's economy, providing employment opportunities and promoting sustainable development.

K. R. Nishank
Director, Kerala State Bamboo Mission

Jan - Mar, 2018
Bamboo and Reed industry is one of the age-old traditional industries of Kerala State. Although, about 28 species of bamboos such as Bambusa bambos, Ochlandra travancorica, Dendrocalamus strictus, Dendrocalamus stocksii, etc. are found in the State, the one with tremendous potential viz. O. travancorica growing extensively beside water bodies as reeds is mainly used for weaving mats by the traditional artisans.

The weaving communities in and around the Angamaly region in central part of Kerala ensure continuous supply of bamboo mats as the main raw material for Bamboo Mat Board (BMB) being manufactured by Kerala State Bamboo Corporation (KSBC). This popular IPIRTI technology for BMB was transferred to KSBC way back in the year 1985 since when continuous production of BMB is going on in Angamaly (Kerala). With BMB as the construction material, KSBC takes turnkey projects in tourism sectors to build huts, eco-hubs in forest and other tourist places for aesthetics and other eco-friendly values. After success in BMB, the KSBC has expanded scope to manufacture Hi-Tech Bamboo Flooring Tiles from their factory at Nallalm, Kozhikode along with Bamboo furniture and other allied products.

From the case studies carried out by Kerala State Bamboo Mission (KSBM), it is estimated that about one lakh artisans forming Community Mat Weaving Centres (CMWC) are earning their livelihood under the umbrella of the KSBC. There are about 17 CMWCs having 85 main and sub depots where Bamboo mats are being produced regularly for manufacture of BMB. Over the years, a value chain network has been put in place among the Forest Department (FD), Reed Cutters (RC), the Weavers’
Community (WC) and the manufacturer - KSBC. The reed cutters are the tribal groups from Adimaly, Pooyamkutty, Edamalaiyar and Thalumkandam whose number stand at about 15000 as registered with KSBC. The average cutting cost of each reed bamboo is Rs.11/reed and in addition 17.5% of annual incentive on total number of reeds cut. In so happening, on an average, a tribal reed cutter earns upto Rs.2.70 lakh per head annually.

The reeds are supplied to the registered weavers who are largely women and there are about 10,000 families of registered workers for producing mats with KSBC. The weaver gets an amount of Rs.166/mat (of size 8.25’ x 4.25’) and she is capable of producing about 3 mats per day. Even after deducting the cost of bamboo, she earns Rs.500/- per day and with 220 mandays/year she can earn about Rs.1.10 lakh/annum.

Both the earnings of reed cutter and weaver are more than the opportunity costs of foregone alternatives for such activities. As a result, the mat production is going on sustainably for the continuous production of BMB from Angamally plant. This is mainly due to the well-established network of FD-RC-WC-KSBC mentioned above which came out handy in addressing the poverty alleviation issues of rural folks long associated with nature and forests for their livelihood. This Kerala model (FD-RC-WC-KSBC) of community mat weaving is a time tested, all weather and longstanding module for rural economic upliftment with the help of Bamboo Value Addition Technology. This needs to be emulated in Bamboo rich states of India and other parts of the Globe.

Dr. B. N. Mohanty, IFS
Director, IPIRTI
Packing plays a valuable, often resource conserving role in the modern distribution of food, beverages and other goods and to maintain that a large and perhaps growing fraction of packaging is wasteful or environmentally hazardous. Nowadays tetra pack based packing system has been increasing largely, it is the main source of packing of liquid food products such as fruit juices and some beverages. In metropolitan cities there will be more consumption of tetra pack based food items. Due to large consumption rate there has been many issues with dumping of this waste which leads to a major concern as they occupy almost bigger spaces for landfilling.

As the tetra packs and water bottles contain liquid almost in less quantities after the consumption which is enough for the mosquitos to breed and causes severe health problems. There is need to learn how the package once used can be recycled to create products that minimize environmental degradation and make economic sense both in terms of production and purchase.

Keeping this in view, Ms. Sujatha. D, Scientist F, IPIRTI, Bengaluru and her team explored a study to utilize this waste tetra packs for value addition. This project involved producing the useful products from the solid waste which can be a substitute for the wood based panels for application in furniture and construction. The process parameters for making composites using tetra packs particles by incorporating resins and without resins have been optimized. The strength properties of all the panels made using tetra pack waste confirms to the required physical and mechanical properties of IS 3087-1985 “Particle boards of wood and other lignocellulosic materials (medium density) for general purposes -Specification”. Of all the formulations worked out, 3% resin on the weight of raw material tetra packs has yielded superior properties. The waterproof characteristics of these composites make this board suitable for applications in high humid conditions.
DEVELOPMENT OF BAMBOO STRIP BASED COMPOSITES WITH EPOXY RESIN

In day-to-day life, people use various panel products and components made up of a variety of materials such as plastic and metals. But these materials are non-renewable and also create environmental problems. Hence, alternative materials produced from renewable resources, which are having better strength and other desirable properties are in demand. Epoxy resin having good mechanical, thermal and electrical properties is widely used as an engineering material. Hence, Dr. Ranjana Yadav, Scientist, IPIRTI Center, Mohali and her team has taken up a project to develop bamboo strip based composites with epoxy resin. In the present study epoxy resin system was used for bamboo strip composite bonding. Epoxy adhesive was synthesized from epichlorohydrin and cardanol modified phenolic resin with an optimized molar ratio of 1:10. Three layered bamboo strip composite has been developed using epoxy adhesive and the same has been evaluated for physical and mechanical properties.

KERATIN MODIFIED UREA FORMALDEHYDE RESIN FOR PARTICLE BOARD AND PLYWOOD

Formaldehyde is an important chemical used in the manufacture of adhesive used as binder for plywood and particle board resins. From the past few years, this chemical has become a subject of concern to the wood based industries. This is due to the emission of formaldehyde that occurs during the manufacture of the boards and subsequent usage.

Urea formaldehyde is most commonly used adhesive in wood based panel industry. This adhesive has shortcomings as it contains high levels of free formaldehyde content which lead to formaldehyde emission. The emission of formaldehyde from panels bonded with Urea formaldehyde resin adhesive become a matter of concern in recent years as it is reported to be hazardous to health and environment. Hence an attempt has been made by Dr. Ranjana Yadav, Scientist, IPIRTI Center, Mohali and her team to develop resin system with lower formaldehyde emission from the panel.

Urea formaldehyde resins were prepared in the laboratory using keratin through copolymerization reaction. Conventional Urea formaldehyde resins were also manufactured without the addition of keratin during the reaction. Through the determination of such reaction technology as molar ratio, adding a sequence of keratin and adding amount of keratin, low toxic urea resin was synthesized. The resins were admixed with suitable hardener and the panels were made. Bond quality and formaldehyde content were evaluated. The results show that adding amount of 5 % keratin and adding keratin with the third feeding of urea is the best choice. From the studies, it is found that keratin addition reduces the formaldehyde content in the panel without affecting the strength properties.
Industry/Organisation visits:

09.02.2018: Dr. Vipin Kumar Chawla, Scientist, IPIRTI, Bengaluru visited Bamboooz factory at M/s. Furn Bambu Pvt. Ltd. at Hulimavu, Bengaluru for setting up a Strip Based Bamboo Board factory at Bengaluru.


17.02.2018: Dr. Vipin Kumar Chawla, Scientist attended Annual General Meeting of Business Solution International at Van Vikas Building, Malleshwaram, Bengaluru.

25-28.02.2018: Dr. Vipin Kumar Chawla, Dr. Pradeep Kumar Kushwaha and Dr. Vinod Kumar Upadhyay, Scientists attended a meeting with Secretary at North Eastern Council, Shillong, and Shri. Gautam Chintey, Director-in-Charge at Cane and Bamboo Technology Center (CBTC), Burnihat, Assam regarding the procurement of equipments/machinery and technical assistance to develop the bamboo sector in North East Region.

03-04.03.2018: Dr. B. N. Mohanty, IFS, Director, IPIRTI visited Coorg District to observe the trees outside the forest for conversion into various panel products especially in the Coffee Estates.

04.03.2018: Shri. S. C. Sahoo, Scientist, IPIRTI, Field Station, Kolkata visited M/s. B.S. Progressive Pvt Ltd., Kolkata to improve the quality of pre-press resin and technique for the manufacture of plywood using pre-press.

11.03.2018: Dr. B. N. Mohanty, IFS, Director and Dr. Vipin Kumar Chawla, Scientist, IPIRTI visited and reviewed the progress of the Bamboo Composite House being constructed by IPIRTI at Botanical Garden in Kothaguda Reserve Forest, Kondapur for M/s. Telangana State Forest Development Corporation Limited (TSFDCL), Hyderabad.
16.03.2018: Shri. S. C. Sahoo, Scientist, IPIRTI, Field Station Kolkata visited M/s. Hi-Tech panel, Raipur, to improve the quality of the plywood and to solve the floor level problem during the manufacture of plywood.

Meetings/Seminars/Conferences

08.01.2018, 12-16.01.2018, 10-13.03.2018 & 19-25.03.2018: Shri Amitava Sil, Officer-In-Charge, IPIRTI, Field Station Kolkata visited IPIRTI, Bengaluru and had meeting with Director, IPIRTI regarding preparation of estimate and items of work to be done for construction of Bamboo Composite house and he also visited Botanical Garden at Kothaguda Reserve Forest, Kondapur, Gachibowli for inspection of civil foundation work and to start fabrication job of bamboo composite house for M/s. Telangana State Forest Development Corporation Limited, Hyderabad.

09.01.2018: Dr. B.N. Mohanty, IFS, Director, Dr. Manoj Kumar Dubey, Joint Director, IPIRTI had the Brainstorming session on Gujarat Center for Value Addition in Wood & Panel Products to revise module of proposed Center in Gujarat submitted earlier with APCCF (R&T), Gujarat State Forest Department, Dr. D. K. Sharma, IFS (APCCF), Gujarat. Representatives of Kandla Timber Association (KTA), Institute of Wood Science & Technology (IWST), M/s. BIESSE India Ltd., & Indian Laminate Manufacturers Association (ILMA) and other stakeholders were also present at IPIRTI, Bengaluru.

21.03.2018: Dr. Narasimha Murthy and Shri. V. Prakash, Scientists, IPIRTI attended one-day workshop on “World Forest Day celebration” at Karnataka Forest Department, Bengaluru.

16.01.2018: Dr. B. N. Mohanty, IFS, Director, IPIRTI chaired the Internal Research Committee (IRC) meeting of IPIRTI, Bengaluru convened by Dr. Manoj Kumar Dubey, Joint Director, IPIRTI.

19.01.2018: Dr. B.N. Mohanty, IFS, Director, IPIRTI attended and chaired a technical session in Institute Industry Integration (III-2018) meet on the theme of “Commercialization of Advanced Hybrid Green Composites Technology” at IWST, Bengaluru in order to ease the rapid industrialization. Dr. Manoj Kumar Dubey, Joint Director and Ms. Sujatha, Scientist, IPIRTI co-organized the meet on Sustainable Materials and Composite Technologies with IWST, Bengaluru and CSIR-Advanced Materials and Processes Research Institute (AMPRI), Bhopal. Scientists of IPIRTI presented the following papers:

i. IPIRTI technologies available for commercialization by Ms. Sujatha and Dr. B.N. Mohanty.
ii. Development of Bamboo Strand Lumber (BSL) for housing application by Dr. Vipin Kumar Chawla, Dr. Pradeep Kushwaha and Dr. B. N. Mohanty.
iii. Bamboo a green construction material for housing towards sustainable economic growth” by Shri. Amitava Sil and Dr. B.N. Mohanty.

Dr. Mamatha.B.S and Dr. Rashmi Ramesh Shanbhag, Scientists, IPIRTI also attended the meet.

23.01.2018: Dr. Manoj Kumar Dubey, Joint Director, IPIRTI attended National Law School of India University (NLSIU) Student Bar Forum on the issue of “Environmental Pollution and Delhi’s Near Crisis”. Shri. C.K. Mishra, Secretary, MoEF&CC, Govt. of India, addressed the session as Chairman at the National Law School, Bengaluru.

31.01.2018: Dr. B. N. Mohanty, IFS, Director, IPIRTI had meeting with Smt. Sikha Chowdhury and other two officials of M/s. Petchem, Reliance Industries who visited IPIRTI to discuss about the prospects of “pMDI” resin from Petrochemicals and possible collaborative project.

08.02.2018: Dr. B. N. Mohanty, IFS, Director, IPIRTI inaugurated the National seminar on “Wood - A way forward for sustainable development” and delivered a technical lecture at IWST, Bengaluru.

Scientists of IPIRTI presented the following papers in the above mentioned National seminar:

1. Influence of different foaming agents on the properties of Light weight wood composites by Dr. Mamatha B.S
2. **Melia dubia** – A sustainable raw material for the Panel Industries by shri. Prakash V. He also presented a Poster - Life Cycle Analysis (LCA) Study of Plywood – Energy Efficient Green Panel which was appreciated and awarded 2nd Prize.

3. Natural durability of a wood: a nature’s boon of carbon locking and mitigation of climate change by Dr. Rashmi Ramesh Shanbhag.

Dr. Narasimha Murthy and Dr. Pradeep Kumar Kushwaha, Scientists also attended the seminar.

**12.02.2018:** Dr. Manoj Kumar Dubey, Joint Director, participated in a video conference meeting with the members from Indian Council for Forest Research and Education (ICFRE), Forest Research Institute (FRI), Society for Applied Microwave Electronics Engineering & Research (SAMEER) and Institute of Wood Science and Technology (IWST) on All India Co-ordinated Research project on ‘Dielectric based wood processing’ of ICFRE at IWST, Bengaluru.

**16.02.2018:** Dr. B. N. Mohanty, IFS, Director, IPIRTI had meeting with Shri. R. K. Mehta and Shri. Sanjeev Karpe regarding collaboration between M/s. Rainbow Bamboo Academy and IPIRTI.

**19.02.2018:** Dr. B. N. Mohanty, IFS, Director, IPIRTI had meeting with Smt. Indrani Mukherjee, M/s. Bambooz regarding collaboration about setting up Bamboo Composite Industry.

**20.02.2018:** Dr. Mamatha. B. S. Scientist, IPIRTI as a resource person delivered a lecture on “Lignocellulosic Composites” for the orientation programme of Degree College under UGC resource Center at Mysore University, Mysore.

**127th BoG Meeting of IPIRTI**

127th Meeting of Board of Governors (BoG) of IPIRTI was held on 15th March, 2018 at Indira Paryavaran Bhawan, MoEF&CC, New Delhi under the chairmanship of Shri. C. K. Mishra, IAS, Secretary to Govt. of India, MoEF&CC, New Delhi & Chairman, IPIRTI, BoG. Dr. B. N. Mohanty, IFS, Director & Member Secretary convened the meeting. Dr. Manoj Kumar Dubey, Joint Director, IPIRTI attended the meeting as a special invitee. Ms. Sujatha, Shri Amitava Sil, Scientists, IPIRTI also attended the meeting as members.

On this occasion, Chairman released Research Reports of the Completed Projects of IPIRTI.

During the course of meeting, the Members expressed their views about how IPIRTI can be more forthcoming through innovative technologies towards the development and growth of industries in
National level. Shri. Siddhanta Das, DGF & SS advised that IPIRTI should strive for up scaling Bamboo technologies towards mass production of finished products for bodies like IKEA and others. Bamboo should be a high valued five star product so as to help farmers, industries along with IPIRTI for fulfilling their aspiration and growth. Member Secretary informed that efforts are afoot to replicate this success story in Bamboo sector across the country especially in North Eastern Region (NER).

23.02.2018: Dr. B.N. Mohanty, IFS, Director and Dr. Manoj Kumar Dubey, Joint Director, Scientists of IPIRTI had meeting with Shri. K.N. Murthy, IFS, Managing Director, Karnataka State Forest Industries Corporation Ltd. Bengaluru about the possible technical collaboration between the two organisations.

26.02.2018: Dr. Mamatha. B. S, Scientist presented a paper during two day National seminar on “Recent trends in Chemical biology and material sciences - 2018” organized by Department of Chemistry, on “Chemistry of Wood Adhesives” at Kuvempu University in Kadur, Chikkamagaluru District.
27.02.2018: Dr. B. N. Mohanty, IFS, Director, IPIRTI had meeting with DGF & SS about India’s participation in Global Bamboo & Rattan Congress-2018 at MoEF&CC, New Delhi.

05-06.03.2018: Dr. B. N. Mohanty, IFS, Director, IPIRTI attended 6th International Conference on Laminates organised by Indian Laminate Manufacturers Association (ILMA) at Gurgaon and presented a guest talk on “Role of Government Institutions with ILMA”.

09.03.2018: Dr. B. N. Mohanty, IFS, Director, IPIRTI attended 3rd meeting of Expert Committee under the chairmanship of Shri. Abhijit Ghose, IFS (Retd.) at New Delhi and presented a guest talk on “Value Addition for Tree growing outside Forests”.

17.03.2018: Dr. B.N. Mohanty, IFS, Director, IPIRTI attended and delivered a lecture in the 2nd AGM of Network for Certification and Conservation of Forests (NCCF) at India Habitat Center, New Delhi.

19.03.2018: Shri. Amitava Sil, Officer-In-Charge, IPIRTI, Field Station Kolkata attended 16th Meeting of CED: 13 as a Principal Member at BIS, New Delhi.

27.03.2018: Dr. Manoj Kumar Dubey, Joint Director, attended the Research Advisory Committee Meeting of Tamil Nadu Forest Department in the State Forest Research Institute, Kolapakkam, Chennai.

Exhibition:

08-12.03.2018: Dr. B. N. Mohanty, IFS, Director, Dr. Manoj Kumar Dubey, Joint Director, all Scientists and technical staff of IPIRTI attended “India Wood” Exhibition at Bengaluru International Exhibition Center. Shri. K. Thanigai, Dr. Rashmi Ramesh Shanbhag, Scientists and Shri. Mahesh & Shri. Jagadeesh, Technical staff exhibited the products developed at IPIRTI in the stall during the Exhibition.

16-17.03.2018: Dr. B. N. Mohanty, IFS, Director, IPIRTI, Dr. Vipin Kumar Chawla, Scientist and Shri. Srinivasa Murthy, Technical Staff participated in the Krishi Unnati Mela & Bamboo Products Exhibition at Pusa Campus, New Delhi inaugurated by the Honourable Prime Minister.
18–20.03.2018: Dr. B.N. Mohanty, IFS, Director, Shri. Thanigai, Scientist and Shri. Chandra Shekar, Technical Staff, IPIRTI participated in the 105th Indian Science Congress at Imphal where IPIRTI showcased its products in Pride of India pavilion.

**Other activities:**

**Nature Camp**

06.01.2018: Dr. B. N. Mohanty, IFS, Director, IPIRTI organised Nature Camp and field visit for all the Scientists, Technical staff and other staff members at Balmuri falls, near Mysuru.

**Martyr’s day**

30.01.2018: Dr. B.N. Mohanty, IFS, Director, IPIRTI observed silence for two minutes along with staff members on the occasion of Martyr’s day.

**NABL Audit**

20–21.01.18: NABL team comprising of assessors Shri. K. Suryanarayana and Shri. Dinesh Burde visited IPIRTI Filed Station Kolkata and audited the laboratory in the field of Mechanical and Chemical scope of testing towards renewal of NABL accreditation.
Visit of Dignitaries:

11.01.2018: Shri. Balaji R., Vice President-Operations and his team from M/s. Featherlite visited IPIRTI, Bengaluru and had a meeting with Dr. Manoj Kumar Dubey, Joint Director, IPIRTI regarding the collaboration on formaldehyde emission testing facility for furniture at IPIRTI, Bengaluru.

24.01.2018: Shri. A. D. Bhosle, Director General of Kundal Academy of Development, Administration and Management, Kundal, Maharashtra visited IPIRTI and had a meeting with Dr. Manoj Kumar Dubey, Joint Director, IPIRTI regarding the potential areas of collaborations with Kundal Academy.

29.01.2018: Shri. Deb Kumar Bhattacharjee, Sr. Vice President, business development, Reliance Industries Limited visited IPIRTI, Field Station Kolkata and had discussion with Shri. Amitava Sil & Shri. S.C. Sahoo, Scientists regarding sponsoring of a project on development of pMDI as an alternate to conventional resins.

09.02.2018: Mr. K.C. Jacob, Chairman & Mr. A.M. Abdul Rasheed, Managing Director, M/s. Kerala State Bamboo Development Corporation Ltd., visited IPIRTI and had meeting with Dr. B.N. Mohanty, Director, IPIRTI regarding the collaboration on Bamboo Industries in the State.

09.02.2018: Shri. Dipankar Mitra, Director, M/s. Mapple Moulding visited IPIRTI, Field Station Kolkata and had a discussion with Shri. Amitava Sil & Shri. S.C. Sahoo, Scientists and requested to visit their factory to attend Floor level problems.

16.02.2018: Shri A.K. Pandey, IFS, Additional Principal Chief Conservator of Forest, Compensatory Afforestation Fund Management and Planning Authority (CAMPA), Bihar and Shri. Rakesh Kumar, CCF visited IPIRTI and had meeting with Dr. B.N. Mohanty, IFS, Director, IPIRTI. He addressed the gathering about wood scenario and institute activities.

05.03.2018: Shri. Indraneil Ganguly, Assistant Professor and Associate Director, University of Washington, School of Environmental and Forest Sciences visited IPIRTI Field Station Kolkata and had a discussion with Shri. Amitava Sil, Officer-In-Charge regarding execution of collaborative work on Bamboo Stranded Board.

03.03.2018: Shri. Ramesh Tiwari, Director, M/s. Styanley Chemical, Rajasthan visited IPIRTI, Field Station Kolkata and had a discussion with Shri. S.C. Sahoo, Scientist regarding submission of a sponsored project.

29.03.2018: Shri. Saibal Dasgupta, ADGFC, MoEF&CC visited IPIRTI, Bengaluru and Dr. B.N. Mohanty, Director felicitated him by showcasing institute activities through video presentations, interactions with officials/scientists & visit to laboratories and plant facilities.
**TRAINING**

**One Year Post-Graduate Diploma Course on Wood and Panel Products Technology:**

34 students are undergoing training for the 29th Batch of one year Post Graduate Diploma Course in Wood and Panel Products Technology (WPPT).

**Short Term Vocational Training Courses:**

**09.01.2018:** Dr. B.N. Mohanty, IFS, Director, IPIRTI presented a technical talk on “High-end products from Green Gold” in the IFS compulsory training programme at Institute of Wood Science and Technology (IWST), Bengaluru.

**12.02-13.03.2018:** One-month training course on “Plywood manufacturing technology” was conducted for 3 candidates at IPIRTI, Field Station Kolkata. Shri. Amitava Sil, Officer-In-Charge, IPIRTI, Field Station Kolkata visited M/s. Century Ply boards (P) Ltd, Kolkata along with the trainees for demonstration on 09.03.2018 as a part of the training programme.

**05-07.03.2018:** A training course on “Particle Board and MDF Manufacturing” was conducted at IPIRTI, Bengaluru for 4 candidates sponsored by M/s. PROTOS Engineering Co. Private Limited Mumbai.

![Dr. B. N. Mohanty, Director, IPIRTI distributing certificates to candidates from M/s. PROTOS Engineering Co. Private Limited Mumbai](image)

**Training Undertaken**

**22-26.01.2018:** Dr. B. N. Mohanty, IFS, Director, IPIRTI was nominated by DoPT, attended one week In-Service Training Programme on the subject “Inner Engineering Leadership Programme” at Isha Foundation Center, Coimbatore.

**19-23.02.2018:** Dr. Narasimha Murthy, Scientist, IPIRTI, Bengaluru and Smt. Riya Tudu Solanki,
Scientist, IPIRTI, Field Station Kolkata participated in the DST sponsored training program on “Climate Change and Carbon Mitigation” held at ICFRE, Dehradun under the National Programme for Training of Scientists and Technologists working under Government Sector

19-20.03.2018: Dr. Manoj Kumar Dubey, Joint Director, IPIRTI attended two Day Training programme for Right to Information Act 2005, organized by Institute of Public Administration at Bengaluru.

26-29.03.2018: Shri Amitava Sil, Officer-In-Charge, IPIRTI, Field Station Kolkata, attended four days training course on “Quality Management System and Internal Audit” as per revised version of ISO/IEC 17025:2017 organized by Institute of Applied Quality Management, Kolkata.

**SHORT TERM TRAINING COURSES FOR APR - SEP, 2018 AT BENGALURU**

<table>
<thead>
<tr>
<th>No.</th>
<th>Course Description</th>
<th>Duration</th>
<th>Dates</th>
<th>Fee</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Analysis Of Raw Materials For Resin Manufacture</td>
<td>3 days</td>
<td>Apr 04-06</td>
<td>11800</td>
</tr>
<tr>
<td>2.</td>
<td>Testing Of Door Shutters As Per IS: 2202, IS:1003, IS: 4020</td>
<td>3 days</td>
<td>Apr 25-27</td>
<td>17700</td>
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<tr>
<td>3.</td>
<td>Estimation Of Preservative Chemicals content In Wood/Plywood</td>
<td>5 days</td>
<td>May 14-18</td>
<td>17700</td>
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<tr>
<td>4.</td>
<td>Peeling &amp; Knife Grinding</td>
<td>3 days</td>
<td>May 23-25</td>
<td>11800</td>
</tr>
<tr>
<td>5.</td>
<td>Wood Seasoning</td>
<td>3 days</td>
<td>May 29-31</td>
<td>11800</td>
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<tr>
<td>6.</td>
<td>Testing Of Flush Door And Block Board As Per IS:2202 And IS:1659</td>
<td>5 days</td>
<td>Jun 04-08</td>
<td>23600</td>
</tr>
<tr>
<td>7.</td>
<td>Plywood Manufacturing-I ( Log Storage, Centering, Peeling, Clipping, Drying, Knife Grinding)</td>
<td>5 days</td>
<td>Jul 09-13</td>
<td>17700</td>
</tr>
<tr>
<td>8.</td>
<td>Plywood Manufacturing- II ( Adhesives For Plywood And Plywood Manufacturing-Resin Preparation, Gluing, Hot Pressing)</td>
<td>5 days</td>
<td>Jul 16-20</td>
<td>17700</td>
</tr>
<tr>
<td>9.</td>
<td>Testing Of Plywood And Block Board As Per IS:303, IS:710, IS:1328, IS:4990 And IS: 1659</td>
<td>5 days</td>
<td>Aug 06-10</td>
<td>23600</td>
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<tr>
<td>10.</td>
<td>Preliminary Bamboo Processing and Bamboo preservations</td>
<td>2 days</td>
<td>Aug 27-28</td>
<td>7080</td>
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<tr>
<td>11.</td>
<td>Bamboo Composites Technology (Mat &amp; Strip based products)</td>
<td>3 days</td>
<td>Aug 29-31</td>
<td>11800</td>
</tr>
<tr>
<td>12.</td>
<td>Low Cost Phenolic Resins Using Renewable Bio Materials As Replacement For Phenol</td>
<td>5 days</td>
<td>Sep 03-07</td>
<td>17700</td>
</tr>
</tbody>
</table>

** Programme Coordinator: Dr. V K Upadhyay, Head, IT & SORIT (upadhyay@ipirti.gov.in). You can apply online by filling and submitting the Registration Form (PDF)/Registration Form (doc). Registration has to be done 10 days before the date of commencement of the course by remitting prescribed course fee. Fees payable to the organization may be sent by crossed Demand Draft in favour of Director, IPIRTI, Bengaluru and sent by post to Post Bag No.2273, Tumkur Road, Yeshwanthpur PO, Bengaluru - 560 022.

* 18% GST
SHORT TERM TRAINING COURSES FOR APR - AUG, 2018 AT KOLKATA

1. Resin Manufacturing  
   3 days  Apr 25-27  11800
2. Particle Board Manufacturing  
   5 days  May 07-11  17700
3. One Month Training Course on “Plywood Manufacturing Technology”  
   1 Month  June 04 - 05 Jul  23600
4. Block Board & Flush Door Manufacturing  
   5 days  Jul 23-27  17700
5. Low Formaldehyde emission adhesives for plywood and particle board  
   3 days  Aug 22-24  11800

** Programme Coordinator: Mr. Amitava Sil, IPIRTI Field Station Kolkata, 2/2 Biren Roy Road (West), Sarsuna, Kolkata-61, Tele Fax:033-24983120, Mob:09874219758 (ipirtikolkata@ipirti.gov.in). Registration has to be done 10 days before the date of commencement of the course by remitting prescribed course fee. Fees payable to the organization may be sent by crossed Demand Draft in favour of Director, Indian Plywood Industries Research & Training Institute. You can apply online by filing and submitting the Registration Form.
* 18% GST

SHORT TERM TRAINING COURSES FOR APR - SEP, 2018 AT MOHALI

1. Testing of Fire Retardant Plywood As Per IS: 5509  
   2 days  Apr 05-06  5900
2. Testing of Plywood As Per IS: 303, 1328, 710 & 4990  
   5 days  May 15-19  14160
3. Testing Of Block board And Flush Door As Per IS:1659 & IS: 2202 (Part - I)  
   5 days  June 12-16  11800
4. Testing Of Fire Retardant Plywood As Per IS: 5509  
   2 days  Jul 17-18  5900
5. Testing Of Plywood As Per IS: 303, 1328, 710 & 4990  
   5 days  Aug 21-25  14160
6. Analysis of Raw Material (Phenol & Formalin)  
   3 days  Sep 11-13  11800

** Lodging and Boarding are not included and have to be arranged by the trainees.
Programme Coordinator: Dr. Ranjana Yadav (ranjana@ipirti.gov.in) IPIRTI Centre (MoEF&CC, Govt of India) B-65, Phase -7, Industrial Area, Mohali-160055, Punjab, Tele: 0172-5095875. Registration has to be done 10 days before the date of commencement of the course by remitting prescribed course fee. Fees payable to the organization may be sent by crossed Demand Draft in favour of Director, IPIRTI, Bengaluru. You can apply online by filing and submitting the Registration Form.
* 18% GST