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INDIAN WOOD & ALLIED PANELS

Volume 19 • Issue 2 A Quarterly Journal on Plywood and Panel Industry April - June 2025

Federation of Indian Plywood & Panel Industry (FIPPI) Celebrates

SHRI SAJJAN BHAJANKA'S PADMA SHRI AWARD 2025

by the Government of India for his remarkable contribution to Trade and Industry

A PROUD MOMENT FOR THE INDIAN PLYWOOD AND PANEL INDUSTRY


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A Quarterly Journal on Plywood and Panel Industry

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ADVERTISING / BUSINESS DEVELOPMENT

Anthony Fernandes

GRAPHIC DESIGN & LAYOUT

Sushil Kumar

EDITORIAL & PUBLISHER'S OFFICE

Federation of Indian Plywood & Panel Industry (FIPPI)
1005, Vikrant Tower, 4 Rajendra Place, New Delhi-110 008, India
Tel: +91-11-25755649, E-mail: fippi@fippi.org, Website: www.fippi.org

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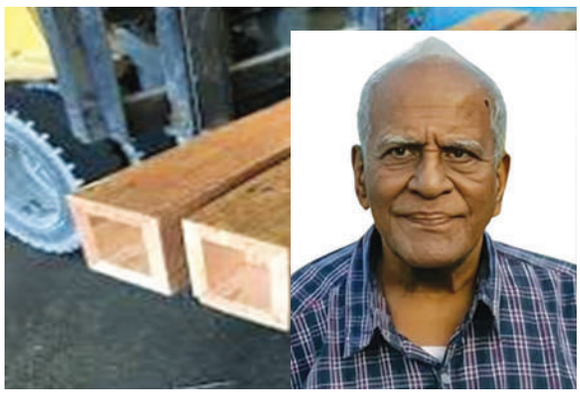

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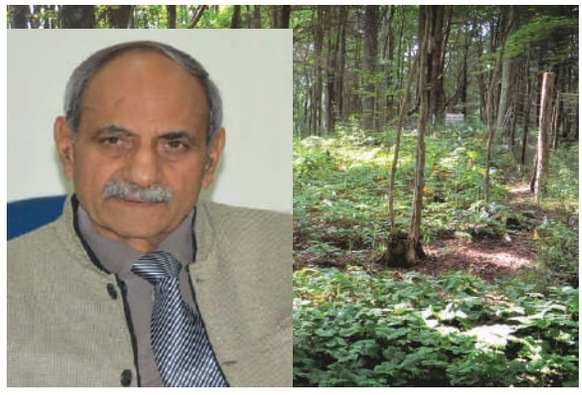

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Group photograph of the Padma Shri Awardees 2025 with Smt. Droupadi Murmu, the Hon'ble President of India, at Rashtrapati Bhavan, New Delhi. The President is joined by the Hon'ble Vice President, Hon'ble Prime Minister Shri Narendra Modi, and other distinguished Union Ministers and dignitaries following the official Padma Awards Ceremony.

A Visionary Leader Honoured: Shri Sajjan Bhajanka Awarded Padma Shri 2025

A Moment of Immense Pride and Recognition for the Indian Plywood and Panel Industry!

Shri Sajjan Bhajanka, Padma Shri Awardee, in conversation over dinner with Hon'ble Commerce and Industry Minister Shri Piyush Goyal, following the award ceremony – discussing the way forward for the upliftment of the Indian Plywood and Panel Industry.

Shri Sajjan Bhajanka, the esteemed Chairman of Century Plyboards (India) Ltd., has been conferred the prestigious Padma Shri Award 2025 by the Government of India for his remarkable contribution to trade and industry. This honour is a testament to his visionary leadership and transformative role in shaping the wood panel and allied sectors in India.

From humble beginnings, Shri Bhajanka built a legacy grounded in perseverance, innovation and strong values. Under his leadership, Century Plyboards has emerged as a pioneering force in the country's interior infrastructure landscape – setting industry benchmarks in quality, technology and sustainable practices.

Over the decades, he has not only expanded business operations across India and global markets but has also remained deeply committed to responsible entrepreneurship. His focus on green manufacturing processes, ethical sourcing and employee welfare reflects a balance between business success and social responsibility.

Shri Bhajanka's journey is an inspiration to aspiring entrepreneurs and professionals alike. His ability to foresee trends, adapt to challenges and stay ahead of the curve has made him a role model in India's business ecosystem.

The Padma Shri 2025 is a fitting recognition of a life devoted to industrial growth, nation-building and value-driven leadership. On behalf of the entire Indian Plywood and Panel Industry, the Federation of Indian Plywood and Panel Industry (FIPPI) extends heartfelt congratulations to Shri Sajjan Bhajanka for this outstanding recognition.❑

FIPPI President's Vision for Panel – Furniture Partnership at India Kitchen Congress 2025

On 4th April 2025, during a keynote session at the India Kitchen Congress held in Bengaluru, Shri Rajesh Mittal, President of the Federation of Indian Plywood and Panel Industry (FIPPI) and Chairman-cum-Managing Director of Greenply, shared his forward-looking vision for a strategic partnership between the Indian panel industry and the furniture sector. He emphasized that a deeper interdependence between the two could lead to greater efficiency, innovation and sustainability – laying the foundation of a robust and future-ready value chain.

During his keynote address, Shri Rajesh Mittal highlighted the following key points:

A) Government Support for the Furniture Sector

He drew attention to the government's initiatives aimed at positioning India as a global hub for furniture manufacturing and exports. Central to these efforts is the 'Make in India' campaign, which aims to transform the country into a leading manufacturing center. Shri Mittal further assured the audience that the Indian panel industry is not only well-positioned to support this growth but is also continuously innovating to meet the evolving needs of the furniture sector.

Rajesh Mittal, President, Federation of Indian Plywood & Panel Industry (FIPPI)

B) Supporting the Rural Economy

Shri Mittal highlighted the direct link between panel manufacturing and the socio-economic status of farmers. Since the raw materials for panel products are sourced from plantation, increased demand for panel products would drive higher demand for plantations, thereby boosting farmers' income and significantly enhancing the carbon sink. He supported this with a data point, explaining that one hectare of plantation generates around 500 man-days of employment over its rotation period. Furthermore, he noted that, according to the Forest Survey of India (FSI), India has about 30.7 million hectares of tree cover outside forest areas, which if properly utilized, could provide a significant boost to the rural economy.

c) Initiatives for Raw Material Sustainability

He stated that to ensure greater raw material sustainability, FIPPI members are actively undertaking plantation drives in their catchment areas and the intensity of these efforts is quite encouraging. He added that such initiatives are expected to increase timber availability in the future, which would help stabilize timber prices and in turn, the prices of plywood and panel products.

D) QCOs as a Catalyst

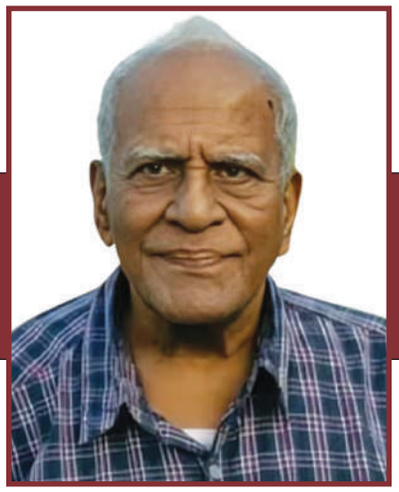
He addressed common myths surrounding the implementation of the Quality Control Orders (QCOs) and reiterated that these regulations will lead to a transformation of the panel market towards superior quality materials. He added that these quality norms would not only streamline domestic industry but also curb the dumping of substandard imported products, thereby ensuring a more standardized and competitive ecosystem for domestic manufacturers. He also cleared up the misunderstanding that QCOs would cause prices to go up, explaining that the Indian plywood and panel industry is too fragmented to be dominated by just a few players.

E) Global Benchmarking

Finally, he applauded Indian manufacturers for embracing innovations and technological upgrades, aligning their processes and products with international standards. He assured the audience that the Indian panel industry is well-equipped with the latest technology and is consistently working to meet global quality benchmarks.

Shri Mittal's address was not just a reflection on where the industry stands today, but a compelling call to action for where it must go. His vision sets the tone for a more responsible, globally competitive and inclusive future for the Indian panel and furniture sectors.❑

Technical Development of Wood-based Panels from Tea chest Plywood to Advanced Composites in India



R.N. Kumar
(Technical Consultant, The Western India Plywoods Ltd, Balaiapatam, Kerala)

1. Introduction

The first plywood factory, established specifically to produce tea chests was in Margherita Assam, namely Assam Sawmill & Timber Company in the year 1920. The industry advanced rapidly during World War II due to the demand for locally produced tea chests. Significant growth existed after the war despite stiff competition from foreign manufacturers and resistance from the tea industry which doubted the suitability of local timbers for tea chests (1). However, support by government policies resulted in import restrictions. This provided a favourable environment not only for the manufactures of tea chest plywood but also enabled the wood industry to diversify and expand into the production of other wood products such as block boards, flush doors, and several types of wood panels (Plywood, Particleboard, Fibreboard) etc.

The period that followed can be called the age of engineered wood composites. This trend in the development of engineered wood products could be in accordance with the famous concept by G.G. Marra (2) namely the "Non-periodic Table of Wood Elements" as depicted in the Fig 1.

This Table presents the downsizing of wood (logs) into different levels of comminuted wood elements namely: strands, chips, excelsior, particles, fiber bundles, refined fibers, flour, cellulose, nano particles. The process to develop new engineered wood composites is by the reconstitution of the various elements mentioned in the table within themselves as well as with the other non-wood materials such as plastic films, metal foils, glass-fibre, gypsum, cement etc. Polymeric adhesives played a significant role in the process of reconstitution to produce engineered wood products of improved and predictable properties.

For the production of tea chests, animal glue, casein and other proteinous materials were used for bonding. Since these adhesives from natural sources were found to be susceptible to attack by microorganisms like fungi, insects etc. synthetic resin adhesives started to substitute for natural adhesives. While a precise information on the initial use of phenolic resin to produce plywood in India is difficult to pinpoint due to lack of published historical data, alcohol soluble phenolic resin (and later water soluble resin) were widely adopted in plywood industry in India as per the personal information the author gathered from his senior colleagues. Amino resins were also concurrently used. The standards like IS: 848:1974 played a significant role during this period.

The engineered wood products produced in our country which have direct connection with one or more of the basic wood elements depicted in the Fig 1 are: plywood of different types, Particleboards, Blockboard, Flushdoors, Hardboard, Oriented Structural boards (OSB), Medium Density Fibreboard (MDF), Wood Wool Cement Boards.

Detailed information has been given in this paper on wood-based composites and the relevant adhesives developed in our laboratories. The composites are: Compreg, LVL, CLT, GLULAM, and Bamboo Phenolic Laminates, Rice husk particle board, GI Faced plywood, Fibreglass faced plywood, Fibre Glass faced Hardboard etc.

The adhesives are cashew nutshell liquid-based adhesives, Tannin based adhesives, cold setting phenolic resin, Resorcinol-formaldehyde and Phenol Resorcinol formaldehyde resin, Phenol Melamine Urea resin.

It must be mentioned that some of the compressed wood panel products such as wood hardboard, compreg and other engineered wood products store carbon for extended period. This merit possessed by such products must be recognized.

Wood-polymer composites, polymer matrix (biofibre-

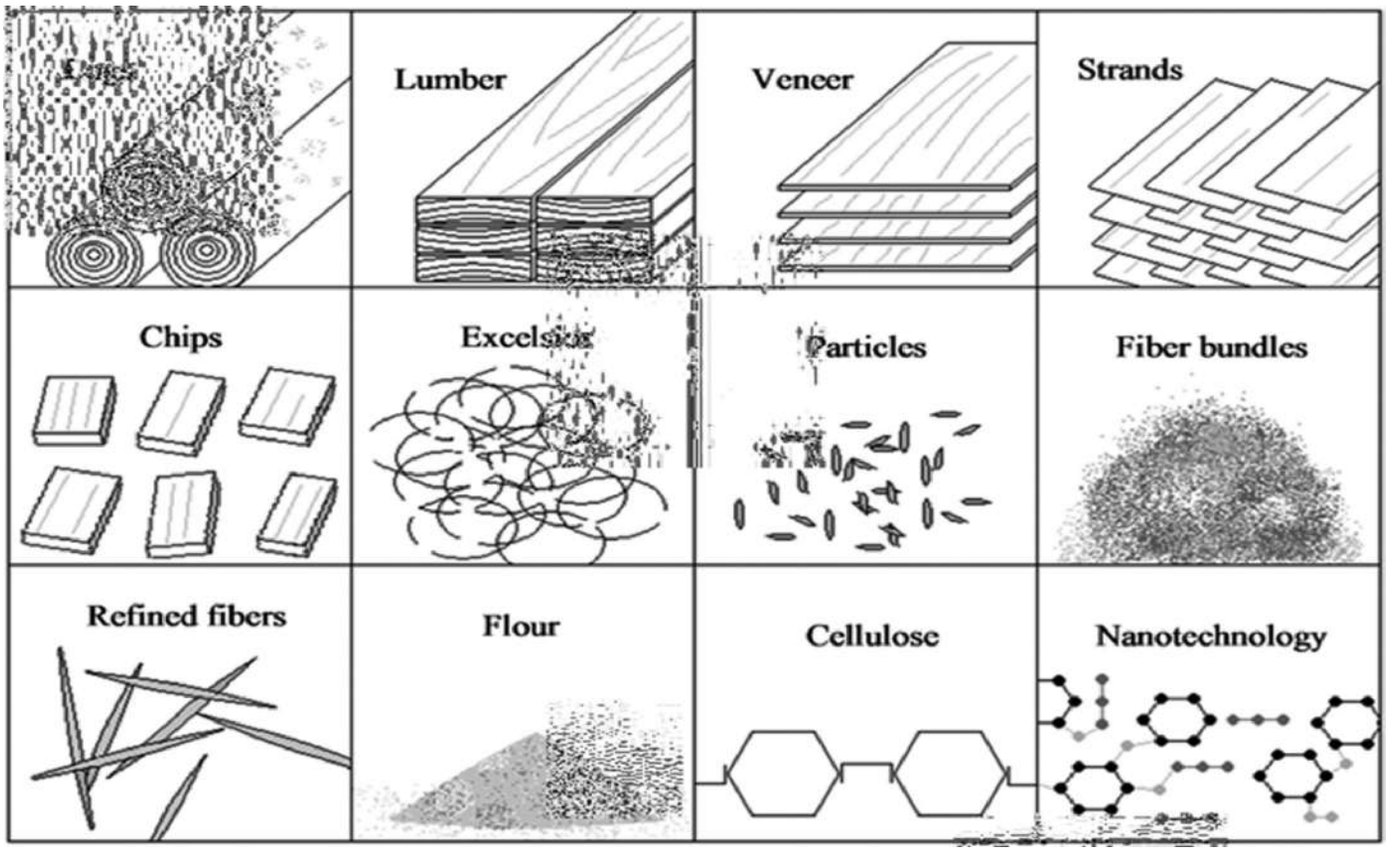


Figure 1: Non-periodic Table of wood elements (G.G.Marra) (2).

thermoplastic) bio-composites have been developed in our laboratories. The research in our research institutions on the incorporation of nano particles into the adhesives to improve rheological and wetting properties of adhesives are of noteworthy significance. Wood Panel Surface Enhancement by curing surface coatings on plywood by Ultraviolet Radiation is another important development worthy of mentioning.

Mode of heating: steam, high pressure hot water, oil heating system are important for the production of wood panels. These modes of heating are well known in industry. For wood joinery, heating modes such as Friction heating, and RF heating are relatively new technologies for producing butt joints, mortise and tenon joints, dovetail joints, tongue and groove joints, and lap joints. Forest Research Institute Dehradun has taken up research on these two modes of heating.

The following sections deal with the research and development carried out in India by the different research organizations on the engineered wood products and polymeric adhesives.

2. Development at the Forest Research Institute, Dehradun (FRI)

Phenol-formaldehyde was prepared in the laboratory using ammonia as the catalyst. The resin so obtained was alcohol soluble and had difficulties in the industry because of cost and fire hazard. Subsequently when sodium hydroxide was used as catalyst, the resin was water soluble, and this was indeed a breakthrough at that time. The industries started using the water-soluble phenolic resin extensively. The manufacture of phenolic resin in large scale kettle posed problem of high exothermicity of the reaction and the necessity to control the reaction was very important to avoid irreversible solidification in the kettle. FRI studied the process in detail and published a number of papers on the synthesis of resin and their properties. The data so collected was the basis of IS:848-1957: Specifications for Synthetic Resin Adhesives for Plywood.

2.1 COMPERG is an impregnated and compressed wood composite made from thin wood veneers impregnated with thermosetting resins and pressed under high pressure and temperature. It is a heavy-duty grade product with excellent physical, mechanical, and electrical characteristics combined with dimensional stability.

2.2 Compreg production in India began in the early 1930s, with a focus on developing indigenous sources for this material. The Forest Research Institute and colleges in Dehradun played a key role in the research and development of compreg.

The Western India Plywoods Ltd, Balaiapatam, Kerala adopted this technology and established facilities such as high pressure hydraulic hot presses, special heating provisions and moulds to make both flat panels (compreg) and products of different shapes (chairs).

Electrical-grade compreg, a specialized wood-based laminate, is primarily used for electrical insulation in various applications. Excellent electrical insulation properties and resistance to moisture, making it suitable for components in transformers, circuit breakers, and other electrical equipment, traction gear and turbogenerators.

Compreg is used for making picking sticks and shuttle guides, making it a versatile material for textile machinery. Filter plates made from compreg are used in the chemical industry.

2.2.1 Compreg is covered by four Indian Specifications:

- **IS 3513:** Part 1:1989 (Resin treated compressed wood laminates (Electrical Purposes).
- **IS 3513:** Part 2 :1989 (Resin treated compressed wood laminates (Chemical Purposes).
- **IS 3513:** Part 3 :1989 (Resin treated compressed wood laminates (Chemical).
- **IS 3513:** Part 4 :1989 (Resin treated compressed wood laminates (Sampling Tests).

3. Bamboo-based phenolic laminates

Bamboo based phenolic laminates were initially developed in India at the Forest Research Institute (FRI) in Dehradun. Later, the Indian Plywood Industries Research and Training Institute (IPIRTI) in Bangalore further improved the technology. The Central Scientific Research Institute for Materials Processing (CSIR-AMPRI) in Bhopal also developed technology for manufacturing bamboo composites, including laminates, which involve cutting, splitting, and chemically treating bamboo before combining it with a pre-polymer and compacting it under heat and pressure. The Western India Plywoods Ltd. was the first company to produce phenolic resin-impregnated bamboo panels. Bamboo-based panels are durable and eco-friendly alternative to traditional materials. They exhibit water, heat, and termite resistance, making them suitable for various applications like panelling, ceiling, partitions, furniture, doors, and windows.

4. Development of adhesives from Cashew-nut-shell liquid.

Extensive investigation was untaken at the FRI under the leadership of Dr. D. Narayanamurti to carry out condensation of cashew nutshell liquid / Cardanol with formaldehyde to produce adhesives suitable for plywood and particleboards. This core research was further continued by other scientists at the then IPIRTI (IWST).

5. Development of tannin-based adhesives to produce wood panel products (IPIRTI)

5.1 In-depth and systematic studies were taken up by Dr. Narayanamurti and other scientists to examine the suitability of tannins from different sources (eucalyptus, mangium, pecan nut, and quebracho tannin, Acacia catechu, tamarind seed testa, cashew kernal testa etc to react with formaldehyde and produce adhesive suitable for producing plywood and particleboards.

5.2 A resin was made by condensing tannin extracted from alder bark with polyethyethylene imine and combination of the above resin with ultra-low formaldehyde resin. A fully bio-based resin was made by condensation of tannin with sucrose (I.W.S.T)

6. Development of cold setting adhesives for fabricating wooden structures

(a) Cold setting PF resin with p-toluene sulfonic acid and, (b) Resorcinol-formaldehyde resin (IPIRTI)

6.1 Work on the development of cashew nut shell liquid /Cardanol-formaldehyde resins suitable for making plywood and particleboard continued. Plywood and particleboard made from the resin exhibited resistance to water due to the presence of long hydrocarbon chain in the molecule of cardanol.

7. Development of Rice husk particleboard (IPIRTI, WIP)

Since cardanol-formaldehyde resin was found to be suitable for plywood and particleboards, experiments were systematically conducted to make particleboards from cardanol-formaldehyde resin. Rice husk is available in large quantity and large-scale experiments were conducted to produce Rice Husk based particle boards by employing cardanol-formaldehyde resin by both IPIRTI and the Western India Plywoods independently. The processes proved to be successful and were patented (3,4,5). The physical and mechanical properties were determined. The results conformed to the BIS Particle board specifications. Since the length of the paddy husk is short and cannot be changed, high mechanical properties could be achieved only by increasing the density and hence the boards are relatively heavy.

The technology developed by IPIRTI was transferred in 1985 to National Development Corporation (NRDC).

Figure 2: Rice husk Particle Board.

8. Wood-Non-Wood Composites Developed in IWST and WIP

8.1 Development of GI -Plywood Composite

In bonding wood to metal with the direct-bonding using high-temperature-setting adhesives, high stresses are developed as the bonds are cooled because of the different coefficients of thermal expansion of the two materials. Stresses are also developed when the wood expands as it regains moisture. These high stresses tend to distort the metal-wood construction and may even rupture the bond if the adhesive is not sufficiently elastic and strong. Hence the phenolic resin was toughened by incorporation of polyvinyl butyral (Redux type) to overcome the stresses mentioned above (6).

Thus GI -Plywood composite was developed by using Redux type of resin. Redux adhesive is a symbiotic combination of Phenolic resin with polyvinyl butyral. Large number of GI-faced plywood sheets were required by ISRO for constructing an Anechoic Chamber. Scientists from IPIRTI went to the Western India Plywoods Ltd. to carry out the trial and demonstrate the process. The Western India Plywoods Ltd. took up the challenge to produce and supply the required number of GI-Faced 8' x 4' sheets to ISRO for the construction of the Anechoic Chamber. Polyvinyl Butyral commercially available was used as adhesive. The process consisted of the first surface preparation of G.I. Sheet by removing zinc from the metal side to be bonded to wood by acid pickling process, protection of fresh mild steel surface from rusting, resin application and incorporation of vinyl resin and pressed at high temperature and pressure.

8.2 Plywood- Fibre-glass Composite (WIP)

The Western India Plywoods developed plywood -fibre glass composite by employing Unsaturated polyester Pre-preg (Sheet Moulding Compound) made from either glass fibre chopped strands or continuous glass fibre mat and bonded on to plywood or hardboard to produce a composite with enhanced mechanical strength, particularly impact strength and resistance to chemicals. A closed mould was employed so that a completely encapsulated glass-fibre-wood composite panel could be produced. Fire-resistant pre-preg can be used to impart resistance to fire.

Instead of fibre-glass, high pressure melamine laminate was also used to produce melamine laminate-hardboard composite.

9. Development of wood structures such as glue-laminated timber (Glulam), Laminated Veneer Lumber (LVL) and Cross Laminated Timber (CLT) by IPIRTI AND IWST.

Large-diameter timbers are increasingly difficult to obtain for use as building material. In order to find a solution to this problem engineered wood products such as glued laminated timber (Glulam), Laminated Veneer Lumber (LVL) and Cross Laminated Timber (CLT) were developed. They can be used for making beams, arches, trusses, joists and columns.

Fabrication techniques to make the above structural elements involve high level of skills. High performance cold setting adhesives are required for the fabrication (Section 10). Performance of these structures under full exposure to weather conditions are part of the research programme.

9.1 Glulam (glued laminated timber) (IPIRTI / IWST)

Glulam is an engineered wood product made by laminating several layers of wood having a thickness of 25.4–50.8 mm together with durable, moisture-resistant adhesives.

It offers a strong, durable, and versatile alternative to traditional solid timber, especially for applications

requiring large spans or curved shapes (Fig 3).

Figure 3: Glulam.

9.2 Laminated Veneer Lumber (LVL) (IWST)

LVL is fabricated by employing veneers of thickness 1.5 to 4.2 mm. The successive layers of the veneers are aligned in parallel along the longitudinal direction of the composite. Suitable adhesive (cold setting) resin is used for bonding (Section 10). Since natural defects such as knots, slope of grain and splits have been removed during the selection of veneers, LVL is an engineered, highly predictable, uniform lumber product. Thus, LVL is considered to be superior to sawn timber and glued laminated timber, particularly for large-span structures.

LVL represents a new technology in wood utilization where in short rotation plantation grown timbers can be used to produce LVLs of superior quality (Fig 4).

Figure 4: Laminated Veneer Lumber (LVL).

Figure 5: Box Beam.

Figure 6: Glulam Beam.

Figure 7: Laminate Truss.

Figure 8: Curved Beam.

9.3 Cross Laminated Timber (CLT) (IWST)

Cross-laminated timber (CLT) is a wood panel product made from gluing layers of solid-sawn lumber together. Each layer of boards is oriented perpendicular to adjacent layers. An odd number of layers is most common (7,8)

10. Development of cold-setting adhesives for bonding wood structural elements (IPIRTI)

(a) Initially cold setting phenol-formaldehyde was developed. Para-toluene sulphonic acid was used as a curing agent to set the resin at room temperature. Structures like beams, box beams (Fig 4) were fabricated. Since para-toluene sulphonic acid was strongly acidic, an alternate resin system (Resorcinol-formaldehyde, Resorcinol-phenol formaldehyde) were developed.

(b) The condensation of resorcinol with formaldehyde is not like the condensation of phenol-formaldehyde due to very high reactivity of resorcinol. The reaction procedure has to be changed to control the high reactivity of resorcinol. Unlike the condensation of phenol-formaldehyde where molar excess of formaldehyde is used, in the case of resorcinol formaldehyde a pre-polymer with molar excess of resorcinol is first made and the additional formaldehyde is added just before bonding the wood elements.

This resin system is ideally suited for making Glulam, Laminated veneer Lumber and other structural elements.

11. A Novel method of preparing the Phenol-formaldehyde resin (IPIRTI)

Presently phenol formaldehyde resin is made in a single stage process by employing a molar excess of formaldehyde over phenol to get "resole". Under the conditions of the production of resole, it is not possible to affect a chain extension indefinitely since, as the length of the chain increases, concurrently the pendant methylol groups also increase and will tend to cross-link rather than promote chain extension. Thus, there is a constraint in the molecular weight development in the resole. Such a constraint will not happen if a novolac is first produced with lesser formaldehyde (first stage) and then converted into a resole (second stage) with additional formaldehyde. High molecular weight novolac can be converted into higher molecular weight resole which has superior properties such as high tack, high cohesive strength particularly suitable for pre-pressing. Adhesive strength is also enhanced.

12. Synthesis of PUMF Resin for the Manufacture of Plywood (9) (IWST)

Phenol urea-melamine formaldehyde (PUMF) resin adhesive is prepared by using phenol, urea and melamine in two different molar ratios. The effects of the molar ratio of formaldehyde, phenol, urea, melamine on performance of PUMF resin adhesive were studied. The resin developed was characterized by differential scanning calorimeter (DSC) and Fourier transform infrared spectroscopy (FTIR). Plywood was manufactured using the developed resin and the bonding properties were evaluated as per IS: 848-2006. The results indicated that the plywood made using PUMF resin of the molar ratio (phenol: urea: melamine): Formaldehyde 1:0.79:0.38:2.15 at pH 9.0 yielded the best result. The studies indicate that the PUMF can be used to make wood-based panels of boiling water-resistant grade (9).

13. Extensive work on reducing Formaldehyde Emission from Wood-Panel products (IWST)

Detailed study was undertaken with success:

(a) to develop formulations to reduce emission of formaldehyde from wood panel products

(b) to develop standard methods to determine the formaldehyde emission and to establish acceptance criteria so that the panel products produced in India are in conformity with International Standards. These results are the basis to formulate BIS standards.

14. Work on Development of Fire-retardant panel products (IWST)

Studies have been undertaken to develop formulations to impart fire resistance to wood panel products to conform to BIS.

15. Development of Wood-Polymer composites (IWST and WIP)

Two types of wood-polymer composites are known from the literature. They are as follows:

(a) Wood-polymer composites made by impregnating wood with vinyl or acrylic monomers and irradiating the same by high energy gamma radiation to effect in situ polymerisation.

(b) Wood polymer composites made by using lignocellulosic bio-fibres as reinforcing component and thermoplastic polymers such as, polypropylene, polystyrene, etc. as polymer matrix.

15.1. Wood Polymer Composites by High Energy Gamma Radiation (WIP)

The Western India Plywoods Ltd. with the technical collaboration with Bhaba Atomic Research Centre (BARC) established Cobalt-60 Gamma radiation facility of strength 100,000 Curie situated in a chamber fully enclosed by concrete walls and roof to irradiate (by Gamma Rays) the monomer impregnated non-durable species of timber. The impregnated monomer undergoes in situ polymerisation inside wood and the physical, mechanical, electrical properties, resistance to moisture, antishrink properties, abrasion resistance of timber is enhanced. Wood species like Holigarna arnottiana, Lophopetalum wightianum, Rubber wood, etc. were upgraded by the process.

Before irradiation, wood is impregnated by the monomer. Since the monomers are expensive, it is necessary to control the quantity of monomer intake during impregnation. For this purpose, an impregnation method developed at the West Virginia University known by the name WVU Cycle was considered ideal. This process consists in using an optimum level of vacuum for the monomer to penetrate into the wood. This was followed by completely draining the monomer and applying high pressure of nitrogen to ensure uniform distribution of monomer in wood.

Monomers generally used were styrene, methylmethacrylate, etc. The wood-polymer composites produced after irradiation of the above system are thermoplastic and therefore can soften during sanding and clog the sanding paper. On the other hand, the methyl-methacrylate -diallylphthalate system was used by WIP. Diallyphthalate (DAP) is a tetrafunctional monomer. Hence a co-polymer of DAP and methylmethacrylate formed by the irradiation will have a three-dimensional network structure and a thermoset. Hence no softening would occur during sanding. These findings are covered by patents (10,11,12).

As mentioned above the monomers are expensive. Because of the high cost of monomers, high investment cost of the irradiation monomers, bio-fibre-thermoplastic composites are preferred.

15.2. Wood-Polymer Composites based on Polymer Matrix Bio-Fibre Composites Developed at IWST

The use of natural fibres as reinforcing fillers for plastics is rapidly increasing, as it significantly increases the tensile strength, flexural strength, and stiffness, while lowering the cost of the resulting composites. At the Institute of Wood Science and Technology (IWST), a systematic study was conducted on the synthesis and characterization of wood fibre/flour filled polypropylene (PP) and polyethylene composites (PE). Due to natural fibre's hydrophilic surface, fibre - matrix compatibility had been a major problem in developing composites using wood fibres as reinforcements. The quality of interface can be enhanced by introduction of chemical bonds across the interface. This could be achieved either by use of coupling agent or grafting polymer segments on the surface of natural fibres. A novel coupling agent was synthesized for improving interfacial adhesion between wood and PP, which can overcome some of the limitations associated with conventional coupling agents like MAPP.

The Institute has further designed and commissioned a 28mm co-rotating closely intermeshing twin screw extrusion system for melt phase functionalization of polypropylene and for compounding wood fibres with thermoplastic resins. This unique design creates a good balance between morphological fineness and filler degrade thereby production of composites with excellent mechanical properties can be achieved (13).

16. Nano technology in the formulation of adhesives (IPIRTI/IWST/FRI)

Nanoparticles are being increasingly used in adhesive formulations to enhance their properties and performance. These nanoparticles can improve various properties of adhesives, such as improving the rheological properties, wettability and adhesive strength, lowering the curing times and increasing durability and stability.

Studies have been undertaken by IWST to determine the effect of nano additives on the rheological properties,

glue shear strength and formaldehyde emission of adhesives. Nano Silicon dioxide (SiO2), nano calcium carbonate (CaCO3 were used in the formulation. Using these nano additives at 5% level, there was an increase in glue shear strength and enhanced rheological properties in amino resin-based adhesive.

Nanotechnologies are to be in forefront for wood structural design and engineering in order to impart an extended carbon storage in the wood products.

An exhaustive review on the impact of nanotechnology in wood science has recently been published by Richa Bansal et al (14). The benefits derived from nanotechnology such as photostability, resistance against fungi and termites, enhanced scratch and abrasion resistance, flame retardancy and improvement of physical and mechanical properties have been highlighted in detail.

17. Wood Panel Surface Enhancement by employing UV radiation

The Western India Plywoods was the first in the country to produce UV curable surface coatings on plywood or hardboard surface either with different colours or on wood grain printed surface. Complex chemistry is involved in formulating different layers of coating (filler coat, base coat, UV curable top coat).

18. Wood Fibre insulation boards have a broad scope in building applications, offering thermal and acoustic insulation.

They are produced by the Western India Plywoods Ltd, Balaiapatam. They are used in walls, roofs, floors, and even underfloor insulation. These boards are increasingly popular due to their eco-friendly nature, sustainability, and ease of installation. Its dense composition and fibrous structure absorb sound waves, damping vibrations and improving overall acoustic comfort within the building. Whether used in residential or commercial settings, wood fibre board insulation contributes to a quieter and more serene indoor environment. Wood fibre insulation board, although combustible, behaves safely in a fire. It burns slowly and does not release toxic gasses.

On the other hand, other insulation boards such as expanded polystyrene, extruded polystyrene, rigid polyurethane foams are highly inflammable and during a fire they can ignite, melt (in the case of polystyrene), can burn rapidly, and produce smoke and toxic fumes.

19. Mode of heating for curing adhesives

19.1 The mode of heating for the purpose of curing the adhesives is in a hot press. The heat transfer involved is by conduction. Examples are steam, high pressure hot water and thermic fluids.

19.2 Friction Welding of wood (FRI)

Rapid timber joining technique is very important to facilitate rapid on-site assembly and rapid off-site prefabrication. Both these benefits can be achieved through the technique called "friction welding". In this energy-efficient process, joints are produced by pressing and rubbing two timber surfaces together at high frequency (50-150 Hz). The resulting frictional heat softens the lignin which functions as a hot melt adhesive. The mechanical interlocking between the two mating surfaces of timber further contributes to an efficient bonding.

19.3 Radiofrequency Heating for curing adhesives in wood joints (FRI)

Radio frequency (RF) heating of wood involves using a high frequency alternating electric field to heat wood, typically for drying or gluing processes. This method heats the water within the wood, causing it to evaporate, and can also be used to cure glues in plywood and other wood products. The use of radio frequency is merely a means of obtaining heat to cure glue lines in wood-to-wood joints. It can be considered a source of heat, like steam and electricity

- RF heating utilizes an alternating electric field created by a generator.
- This field causes the water molecules in the wood to oscillate rapidly, generating friction and heat.
- The heat is generated internally within the wood, rather than just on the surface, leading to more uniform heating compared to conventional methods.

Electrical impulses or energy that are generated in suitable equipment are transmitted at very high frequency. Their passage through any mass results in the development of frictional heat. The radio waves in RF heating range in frequency from 2 to 30 megacycles.

The following are the modes of heating to cure the adhesive in a joint (14):

1. Perpendicular heating
2. Parallel heating
3. Stray Field Heating

20. Education and source of knowledge in Wood Science and Technology

Source of knowledge and information is sine qua non for the industrial growth. The wood-based industry has been continuously having the source of knowledge from

the very start. In the beginning FRI, Dehradun was the only institution to guide. Now other institutions have been established in the country and the details of the same are given below:

20.1 Forest Research Institute, Dehradun

Programme Objective: The Master in Wood Science and Technology programme aims to provide opportunity to the students wishing to pursue professional careers in science and technology of wood as natural resource and to make themselves aware about the problems related to wood as basic material to manufacture various useful products. The structure of the curriculum is designed to synthesize multi-disciplinary knowledge in the biological and physical science of wood and its industrial application. The syllabus comprises of basics of wood anatomy, chemistry, physics, mechanics as well as processing knowledge and techniques to manufacture solid and composite wood products. The programme is designed to improve the qualitative, quantitative, and futuristic aspects of students. Students are also expected to improve their capacities as leaders and managers through study tour, industrial attachment and excursions and other opportunities. Human Resource Management and Marketing and Enterprise Development are also the part of syllabus to build their entrepreneurial skills and aptitude.

20.2 IWST-IPIRTI

The Institute of Wood Science & Technology (IWST) and Indian Plywood Industries Research & Training Institute (IPIRTI) offer various training and short courses in wood science and technology. These courses are designed for a range of individuals, including traditional carpenters, industrial workers, and those seeking to start woodworking businesses. The details of these courses are available in their official websites.

20.3 Department of Wood Science and Technology, Kannur University, Kannur, Kerala

School of Wood Science and Technology, Kannur University conducts a unique M.Sc. Wood Science and Technology (Industry-linked) course with synergistic combination of the conventional University post-graduate level academic system with concurrent industry level apprenticeship programme. As per the course structure, the Department of Wood Science and Technology, Kannur University conducts theory and practical classes for 6

Table 1: Natural and Synthetic Resin Adhesives Employed for the fabrication of Wood based Composites

S. No.	Polymeric adhesive	Properties	Section Number
1.	Natural Adhesives Animal glue Casein, Starch	No resistance to insects and fungal attack	1.0
3.	Phenol-formaldehyde resin Alcohol and alkali soluble	Very good resistance to boiling water and stringent weather conditions	2.0
4.	CNSL or Cardanol -formaldehyde resin(a)	Plywood and Particleboard made from the resin could give good BWR grade	4.0
5.	Tannin based resins	Good BWR grade plywood and particle board In the laboratory	5.0
6.	Tannin with polyethylene imine resin combined with ultra-low HCHO resin		5.2
7.	Fully bio-based resin from condensed tannin with sucrose		5.3
8.	Cold setting PF resin with p-tuluene sulphonic acid	Good BWR grade. Used for fabricating GLULAM	6.0
9.	CNSL or Cardanol -formaldehyde resin (b)	Rice husk particleboard conforming to Indian Standard for particle boards	6.1
10.	Redux Type Resin	GI-Sheet-Plywood Composite	8.0
11.	Unsaturated Polyester based pre-preg	Plywood Glass fibre composite Composite	8.1
12.	Resocinol- Resorcinol Phenol formaldehyde Resin	Production of Compreg, LVL and Cross Laminated Timber (CLT)	10
13.	Novolac to Resole PF Resin	Suitable specifically for pressing	11
14.	PUMF Resin	Suitable for wood panel products	12

months at the university as prescribed by the syllabus similar to any other University Departments. The students work for the next 6 months in the factory (WIP) and acquire hands-on experience with all the unit operations and processes adopted in the manufacture of wood-based panels and composites. Further students are also exposed to workshop practices, Quality Control, finance, marketing, accountancy, etc. at different departments in the Western India Plywood Ltd. (WIP). Thus, the students get both the University level academic education as well as in-plant training in the industry. This type of a curriculum exists only in the Kannur University in India.

21. Conclusion

The above article describes the historical growth and transformation in India of the wood panel industry from tea chest plywood to advanced composites. It is interesting to perceive a creative pattern in the development of these wood products such as plywood, particleboard, MDF, Block board, Flush doors, OSB, Rice husk board, Glulam, Laminated Veneer Lumber (LVL), Cross-laminated Lumber (CLT), Box-beam are all nothing but the reconstituted products derived from wood elements depicted in Fig.1. Our research laboratories, FRI, IPIRTI and IWST have also played a significant role in the development of Products such as Wood-Polymer Composites (by Gamma Radiation), Wood-Polymer Composites (bio-fibre thermoplastic composites), Adhesives such as phenolic resin, tannin based adhesives, Cashew-nut-shell liquid formaldehyde adhesives, Melamine-formaldehyde adhesives, Melamine-urea-phenol-formaldehyde resin adhesives. Contribution of these laboratories in the development of adhesive formulations to produce wood products which conform to International Standards on formaldehyde emission.

Research Institutions such as FRI, IPIRTI, and IWST are also centres of knowledge dissemination to the wood industry. These institutions are playing a significant role in the standardisation of the wood products.

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Defining Preservative Treatment Regimes for Plywood and Wood-Based Panels in India

Dr. Richa Bansal
Assistant Director
Federation of Indian Plywood and Panel Industry (FIPPI)

1. Introduction

Wood-based composites represent one of the fastest growing segments of the forest products industry. The development of wood-based composites – both panel products and structural composites over the past 50 years has revolutionised the forest products industry. It has enabled modern society to continue to rely on the renewable and sustainable forest resource, while also permitting a dramatic shift at the forest level – to plantation forestry. Here fast-grown trees, managed as a crop, can supply the bulk of the demand, alleviating pressures on old-growth forests and slower grown timber from more fragile ecosystems. Continued population growth and improvements in quality of life will continue to drive this trend for the foreseeable future (Spear, 2015).

Unlike dense hardwoods that may possess natural durability, most panel products are made from low-durability species and are bound with adhesives susceptible to hydrolysis and degradation. Biodegradation from fungi, termites, marine borers, and other biological agents can significantly reduce the service life of panel products, particularly when used in moist or ground-contact environments (Gardner et al., 2003; Wu, 2004). The marine wood borers, inhabiting the costal ecosystems, are the primary agents of wood degradation in the marine timber structures (Efhamisisi, 2015). To be effective, preservative-treated marine plywood must resist delamination under high moisture conditions while maintaining sufficient toxicity to prevent marine borer infestation (Mitchoff, 1989).

To determine whether a wood component needs preservative treatment, three main factors must be considered: the biological hazard, the risk and consequence of failure, and the inherent natural durability of the wood. To address these vulnerabilities, various preservative treatment methods have been developed, including the use of durable raw materials, glue-line additives, and post-manufacturing treatments. Compatibility between adhesives and preservatives remains a critical factor in ensuring product performance (Kalawate, 2016).

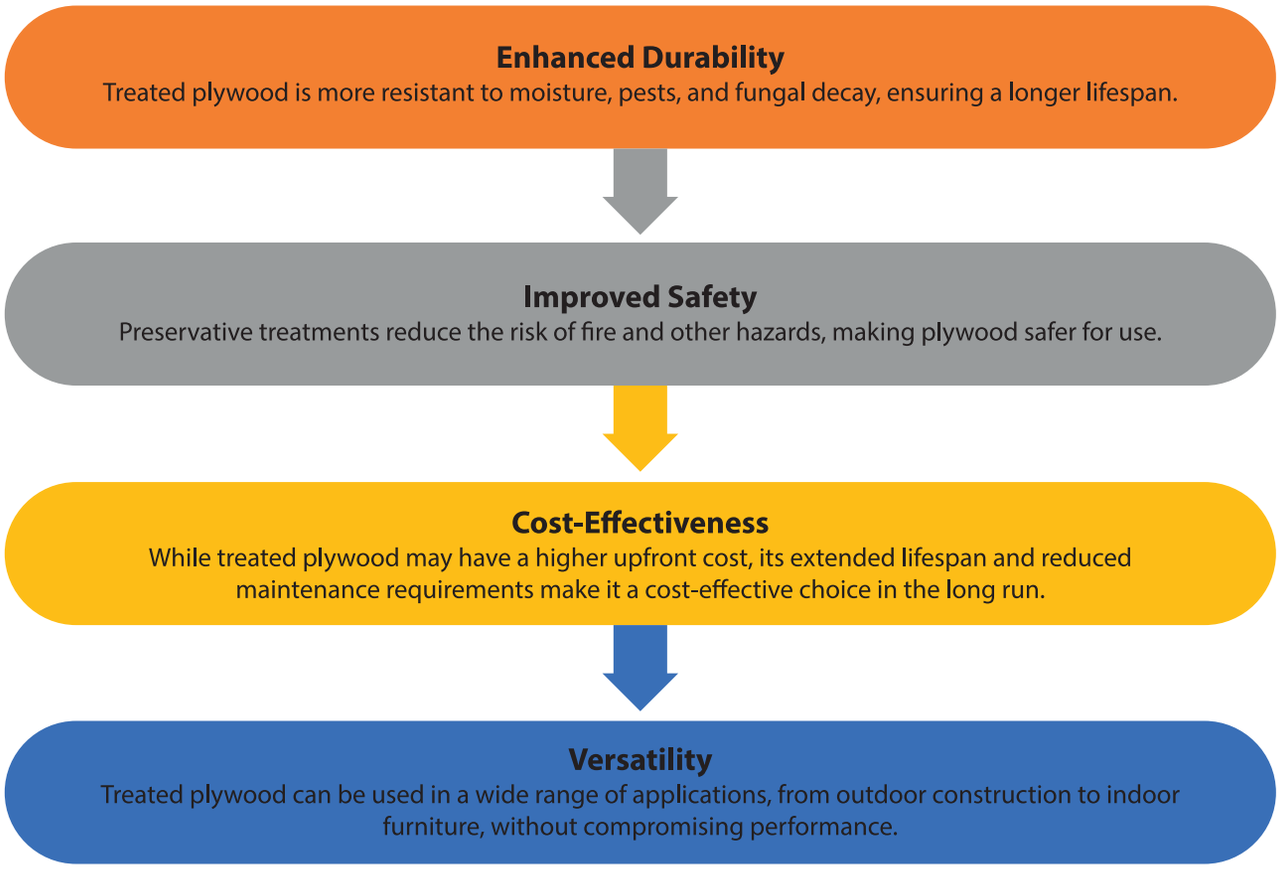
This article critically examines the current preservative treatment provisions in Indian standards for plywood and panel products, identifies gaps between regulatory expectations and industry practices, and offers pragmatic recommendations for treatment regimes tailored to product type, use environment, and lifecycle sustainability. It also emphasizes the need for India's preservative treatment requirements to align with international standards and performance-based approaches to ensure product safety, efficiency, and global competitiveness. Additionally, the article addresses the environmental implications of preservative-treated panels at the end of their service life and recommends treatment strategies that are both effective and eco-conscious.

2. Preservation Techniques for Wood Composites

Protecting wood composites from biological degradation is critical, particularly in outdoor or moisture-prone construction applications. Studies worldwide, including in India, have shown that properly treated wood can last 3–5 times longer than untreated timber, and even 8–10 times longer in covered environments. This highlights the importance of effective preservative treatments. The effectiveness of a preservative depends not only on the preservative type but also on achieving sufficient retention and penetration (Acker and Stevens, 1993; Tascioglu and Tsunoda, 2012).

Effective preservatives must satisfy key criteria: they should provide protection in the intended service environment, have minimal toxicity to humans and ecosystems, resist leaching under moisture exposure, and be economically viable (Richardson, 2002; Lebow, 2010).

Chemically treated plywood offers several advantages over untreated plywood, including:



However, a key challenge in treating plywood and other engineered panels lies in the interaction between preservatives and adhesives. Since preservatives are chemical agents, they can interfere with the adhesive curing process or reduce the wettability of the wood surface, leading to poor bonding. In some cases, the preservative may act as a physical barrier that prevents the adhesive from forming a strong bond with the wood fibers (Barnes and Amburgey, 1993).

2.1. Preservation Systems for Wood Composites

Preserving wood-based composites presents complex challenges and opportunities compared to solid wood due to the variety of composite types and manufacturing processes involved. There are three primary methods for manufacturing treated wood composites, based on the manufacturing process of the composite material. These methods include:

a) Pretreatment of wood furnish

This involves applying preservatives to raw materials—veneers, particles, or fibers— using either pressurized or non-pressurized methods like spraying or dipping with liquid-based formulations (Ross et al., 2003; Wu 2004). The appropriate combination of preservative and adhesive in this process can provide a product with consistent preservative distribution throughout the thickness of the product. However, this process also raises environmental concerns, particularly regarding emissions from driers and during pressing of the composite, waste disposal, and adhesive compatibility (Wu, 2004).

b) In-line Treatment

In this method, preservatives are incorporated during manufacturing by either, spraying powdered preservatives (e.g., zinc borate) onto dry furnish, or by premixing preservatives with resin (Glue Line Treatment) and applying it to the furnish, typical for veneer-based panels like plywood and LVL (Ross et al., 2003; Wu 2004; Kirkpatrick and Barnes, 2006).

In both approaches, it is essential to ensure uniform distribution of the preservative throughout the treated component, and the ingredients must be capable to withstand the high pressing temperatures and must be compatible with the adhesives used. Because the preservatives are distributed uniformly throughout the thickness of the panel, they provide effective, long-lasting protection against decay, mould, insect damage, and moisture penetration, reduced costs by eliminating the need for a second processing step, and ease of integration, as preservatives can be added during the blending stage along with adhesives and water repellents, requiring minimal process changes (Kirkpatrick and Barnes, 2006).

Glue Line Poisoning (GLP) is a technique in which preservative chemicals are incorporated directly into the adhesive formulation used in plywood manufacturing to enhance its durability. This is a simple process in which the adhesive containing the preservative penetrates the veneer layers, offering protection against wood-destroying organisms. However, adhesive compatibility must be carefully assessed, as preservatives may affect glue bond strength, which is critical to the mechanical performance of plywood.

c) Post Treatment of Finished Products

Post-treatment refers to the application of preservative treatments to wood composite products after the manufacturing process is complete. These treatments are typically carried out through methods such as immersion or spraying and are primarily intended to offer short-term protection against mold, decay, and moisture intrusion (Wu, 2004; Efhamisisi, 2015). One of the key advantages of post-treatment systems is that they are relatively easy to apply, making them an ideal choice for protecting materials during transportation, storage, and the construction process (Ross et al., 2003). Advanced techniques like vapor-phase treatment offer deeper penetration by forming a "penetrating barrier" of protection (Ross et al. 2003, Baileys et al. 2003). This process exposes composite products to volatile boron compounds like trimethyl borate (TMB) which lead to hydrolysis of the ester and deposition of the active preservative ingredient, boric acid in the wood (Murphy, 1994).

3. Standards and Regulatory Framework

In India, the durability and preservative treatment requirements for plywood and other wood-based panel products are governed by a series of Indian Standards specifications. IS 12120: 1987 gives details for protection of plywood, blockboard, flush door and particle board used internally or externally under diverse conditions to give economic service life. IS 5539: 1969 is another Indian Standard which deals with the treatment of plywood for protection against fungi, termites and other insects and marine borers and requirements of preservative treated plywood.

While these standards were formulated with the intention of ensuring durability and performance under various service conditions, their preservative treatment provisions remain largely rooted in solid wood preservation practices, with limited adaptation to the evolving technologies and practical constraints of the engineered panel industry.

Over time, the manufacturing ecosystem has shifted toward in-process treatments like glue-line poisoning (GLP), and the use of synthetic pyrethroids, many of which are not yet adequately reflected in the current versions of various standards. Furthermore, certain specified treatments, such as pressure impregnation at high retention levels, often result in practical difficulties like glue failure, warping, and surface degradation.

This section critically examines the preservative treatment clauses in IS 303, IS 4990, IS 710, and IS 1659, identifies gaps between prescribed standards and industry practices, and proposes improvements aligned with modern treatment technologies and international performance-based approaches.

3.1. IS 303: General Purpose Plywood

a) Current Provision

In General Purpose Plywood, IS 303, currently, veneer treatment is specified.

> 7.1.1.1 Veneers from non-durable species and sapwood of all species, when used for plywood manufacture shall be soaked in 1.25 percent solution of boric acid or 1.9 percent solution of borax at a temperature of 85 °C to 90 °C for a period of 10 min to 40 min depending upon the thickness of the veneers, or the veneers may be dipped in 2 percent solution of boric acid or 3 percent borax solution for 2 min and block stacked at least for 2 h. Alternatively, the veneers may be soaked at an ambient temperature in a mixture of 0.5 percent solution of sodium peotachlorophenate and 1.5 percent of borax in water, for a period of 2 min and then stacked for at least half an hour before drying.
>
> 7.1.1.2 For BWR and BWP Grade of plywood bonded with synthetic resin adhesive, the preservative may be given conveniently after boards come out of the press, while still hot or the treatment given to the veneers before bonding.
>
> 7.1.1.3 For BWR and BWP Grade, fixed type of preservative may be used subject to the agreement between the manufacturer and the user according to IS 5539.
>
> 7.1.1.4 Any other type of preservative treatment may also be given to plywood or veneer as per agreement between the manufacturer and the purchaser, or as declared by the manufacturer.

b) Challenges and Limitations

The veneer treatment method specified in the standard is seldom adopted by the industry today due to its impracticality and lack of consistency. In contrast,

most manufacturers adopt glue line treatment, which has proven to be more effective and reliable than traditional veneer treatment in providing protection against microbial and insect attack. Many plywood products are used for short-term purposes (e.g., packaging) and do not require high levels of biological protection. However, the standard does not differentiate between plywood used for short-duration, indoor applications and those exposed to moderate biological risks, resulting in a one-size-fits-all preservation requirement.

c) Suggested Provision

Current industrial practice primarily involves glue-line treatment, followed by briefly immersing or spraying the boards with chemical solutions. The main objective of this step is to achieve a uniform surface colour and to deposit a superficial layer of preservative chemicals. Considering these practices, there is a need to revise the treatment clause in IS 303 to explicitly address both treated and untreated products, regardless of their grade—MR (Moisture Resistant), BWR (Boiling Water Resistant), or BWP (Boiling Waterproof). The revised clause should also include provisions for appropriate marking on the product surface to distinguish between treated and untreated boards. This will help meet diverse market requirements and enhance transparency in product classification.

It is recommended that Clause 7.1.1.1 of IS 303 be modified to provide flexibility in preservative treatment, depending on intended end use:

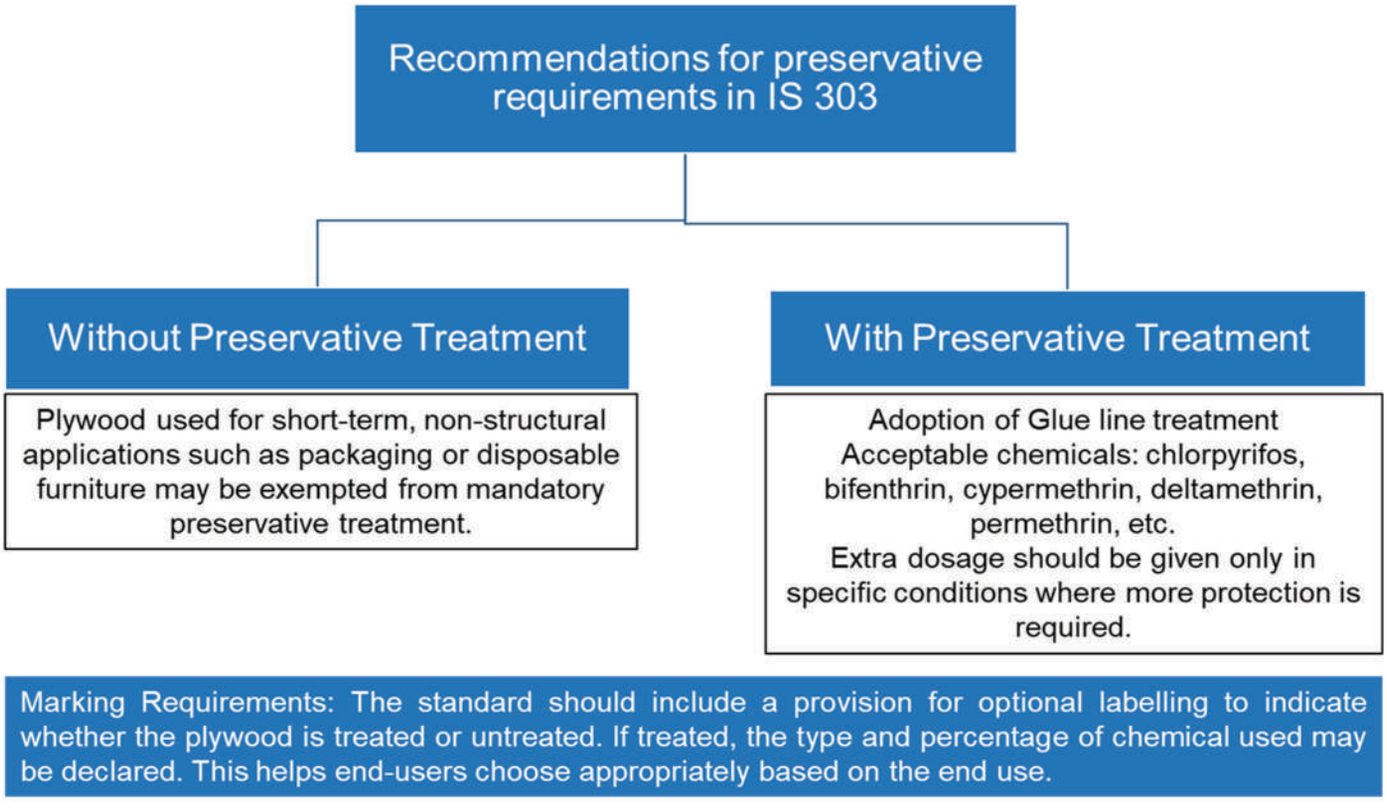
3.2. IS 4990: Shuttering Plywood

a) Current Provision

IS 4990 governs the specifications for shuttering plywood used as a temporary formwork in reinforced concrete construction. As per the current standard, the plywood must undergo pressure treatment with fixed-type preservatives such as Acid Copper Chrome (ACC) or Copper Chrome Boron (CCB), with a minimum retention of 12 kg/m^3. The standard assumes a need for long-term durability despite the short service life of the product.

b) Challenges and Limitations

Shuttering plywood has a Short Service Life and is generally used for a short duration of 3 to 6 months and is often discarded after use. Applying intensive preservative treatment for such temporary applications is excessive and not economically viable. Moreover, pressure treatment often leads to non-uniform distribution, with excessive chemical retention on the surfaces and edges while leaving the core untreated, leading to a patchy appearance, discoloration, and a poor surface finish that affects the product's marketability. Dimensional instability is another concern, as post-treatment drying can cause warping, surface cracks, and a loss of flatness, all of which compromise the performance of shuttering plywood. The treatment process may also weaken glue bond strength due to repeated pressure and vacuum cycles, adversely impacting the structural reliability and potential for



reuse. Additionally, while IS 401 and IS 12120 recommend reapplication of preservatives at cut or drilled edges, such practices are rarely implemented on-site, as they are impractical for carpenters—leaving these exposed areas susceptible to localized fungal or borer attack.

c) Suggested Revisions

Most manufacturers rely on overlay protection using phenol-formaldehyde or creosol-formaldehyde resins, as in Coated Shuttering Plywood (CSC) and Film-Faced Shuttering Plywood (CSFF) types, which provide an envelope thereby providing sufficient surface resistance against fungal and termite attack for the expected lifespan of the shuttering formwork. Some also apply GLP treatment as an in-process solution, which does not alter surface finish or dimensional stability and maintains glue line strength.

In view of its short service life and inherently protected usage environment, shuttering plywood does not require such high levels of preservative treatment as currently prescribed. It is recommended that IS 4990 be revised to adopt a more performance-based and hazard-class-oriented approach, in line with international practices such as AS/NZS 1604.1:2021. This would recognize varying degrees of biological exposure and service life across shuttering panel types. Specifically, GLP-based treatment followed by a dip treatment in line with Hazard Class H3 should be permitted for CSC and CSFF types, while plain shuttering plywood (CS Type) may be treated with dip (hot and cold) methods at significantly lower chemical retention levels. In the plain type of shuttering plywood, three options can be given: with preservative, without preservative and dip treatment method. Manufacturers may declare the type of preservative and method of application used, especially if pressure treatment is not employed, ensuring clarity for users.

From an environmental standpoint, reducing the chemical load is equally important. Shuttering plywood, when disposed of after short-term use, often ends up in landfills or is burned, and a high preservative content could result in soil and water contamination or toxic emissions. Lowering chemical retention, using less toxic preservatives, and offering treatment flexibility would minimize the environmental impact while still ensuring functional performance.

3.3. IS 710: Marine Plywood

a) Current Provision

IS 710 specifies the requirements for marine-grade plywood, designed for use in highly moist and wet environments—including boat construction, coastal structures, and high-humidity interiors. According to Clause 5.3 of the standard, plywood must be given pressure impregnation with fixed-type preservatives such as Acid Copper Chrome (ACC) or Copper Chrome Boron (CCB) with a minimum retention of 12 kg/m^3, or 100 kg/m^3 in the case of creosote or creosote-oil formulations, following the procedures in IS 5539.

b) Challenges and Limitations

In practice, pressure impregnation at such high retention levels presents numerous difficulties in marine plywood manufacturing. One of major issues is the uneven distribution of preservatives, as the pressure treatment results in non-uniform penetration, with heavy chemical accumulation near surfaces and insufficient penetration in the core, leading to compromised long-term protection. This surface saturation often results in visible degradation,

For Plain Shuttering Plywood (CS Type)

Use of water-soluble fixed-type preservative treatment aligned with the H4 Hazard Class specifications from the same standard.

The shuttering plywood of plain CS type shall be given a preservative treatment as given in IS 5539 and conditioned to a moisture content not exceeding 15 percent. The preservative used shall have a copper-chrome-boron (CCB) composition or acid copper-chrome (ACC) composition, with retention of not less than 0.7 % of the dry weight of wood or 3.5 kg/m^3 through dip (hot and cold) treatment of the finished plywood panel.

For Coated Shuttering Plywood (CSC) and Film-Faced Shuttering Plywood (CSFF)

Adoption through glue-line treatment in accordance with the requirements specified under H3 Hazard Class of AS/NZS 1604.1:2021

The shuttering plywood of type CSC and CSFF shall be treated with glue line preservative chemicals such as Triadimefon or chlorpyrifos / equivalent chemical so as to achieve retention of 0.095 % based on the dry weight of wood or 0.5 kg/m^3

such as discoloration and blotching, making the product less marketable, especially for applications requiring clean aesthetics. Additionally, the high-pressure and vacuum cycles involved in treatment can adversely affect glue-line integrity, particularly when phenol-formaldehyde adhesives are used without ensuring compatibility with the preservative system. Warping, cupping, and other dimensional changes during post-treatment drying further limit the use of such panels in precision-based applications like cabinetry or marine interiors. Moreover, recommendations for on-site re-treatment of cut or drilled areas are rarely implemented in practice, especially in mobile or remote marine settings, leaving exposed sections vulnerable to fungal or borer attack.

Environmental implications are also significant. Disposal of heavily treated marine plywood can release harmful chemicals into soil and water or emit toxins when incinerated. Furthermore, the rigid specification in IS 710 fails to consider use-specific treatment needs, despite varied applications of marine plywood in boatbuilding, wet-area construction, and structural uses.

c) Suggested Revisions

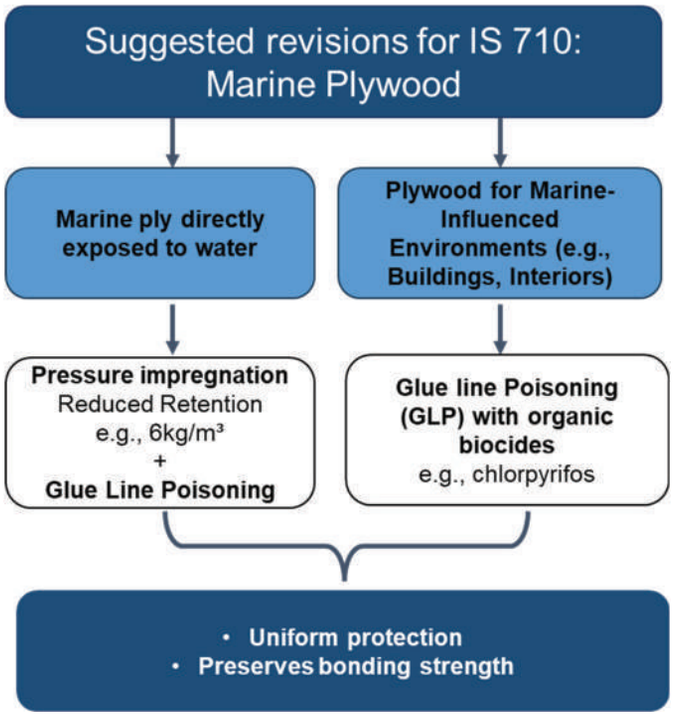
British Standard BS: 1088 does not mandate preservative treatment for marine plywood, instead recommends the use of naturally durable hardwoods with a density above 500 kg/m^3. However, for high-risk marine environments (Use Class 5 as per BS 335 and BS 8417), treatment is advised with a minimum chemical retention exceeding 1.0 kg/m^3, depending on the preservative. In the New Zealand standard, AS/NZS 1604 glue-line treatment of plywood using approved organic biocides such as cypermethrin, deltamethrin, permethrin, bifenthrin, and imidacloprid is allowed. Chemical retention and distribution are assessed through colorimetry and spot tests, with prescribed lethal doses tailored to different exposure conditions and target organisms.

To bring IS 710 in line with modern manufacturing practices and international benchmarks, a two-tiered treatment strategy is recommended based on the plywood's intended application. For marine plywood directly exposed to seawater, pressure impregnation may be retained as an option, but with reduced retention levels (e.g., 6 kg/m^3 for CCA, equivalent to H6 hazard class in AS/NZS 1604.1), followed by a Glue Line Poisoning (GLP), which are sufficient to resist marine borer and fungal attack without compromising plywood properties.

For applications not in direct contact with water, such as structural use, interiors of marine craft, or buildings in close vicinity to marine conditions, treatment through Glue Line Poisoning (GLP) with approved organic biocides (e.g., fipronil, chlorpyrifos, bifenthrin, permethrin) should be adopted as the primary method.

The advantages of this approach include uniform chemical distribution, non-leachability, preservation of bonding strength, and compatibility with overlays and finishes. Additionally, GLP-treated plywood shows superior durability at cut edges and drilled portions, where biological attack is most likely.

Thus, Clause 5.3 of IS 710 should be revised to recognize GLP and surface dip treatments as effective and preferred options. Pressure treatment may remain optional, based on buyer preference and end-use conditions. This update would ensure product durability, ease of manufacturing, cost-effectiveness, and environmental safety—without compromising the intended performance of marine-grade plywood.



3.4. IS 1659: Block Board-Specification

a) Current Provision

IS 1659 outlines specifications for block boards, including the use of preservative treatments to protect the wooden battens (fillers) against borers and insects. Clause 6.1 of the standard mandates that non-durable species, including sapwood, must be treated in accordance with IS 401. Additionally, Clause 9.2.6 prescribes a spot test to verify thorough preservative penetration across the cross-sectional area of the board, particularly for borax and boric acid-based treatments applied using hot and cold processes. This treatment aims to enhance biological durability, especially in applications where block boards are used in furniture, cabinetry, or wall paneling.

b) Challenges and Limitations

In practice, the standard's preservative treatment requirement, primarily based on borax dipping and verified through spot testing—poses several limitations. Blockboards contain solid wood cores, which often consist of low-durability plantation species like poplar or eucalyptus. These cores are more prone to borer and termite attack, but the standard prescribes no specific treatment for them. Wetting the filler wood (battens) during dip treatment can lead to dimensional instability, increased drying time, and challenges in maintaining product flatness and adhesive bond integrity. Second, the spot test currently mandated does not align with industry practices where non-water-based or in-process treatments, such as Glue Line Poisoning (GLP), are widely used and effective but do not show visible penetration like traditional borate treatments.

Additionally, block boards in modern use are typically protected externally through lamination, edge binding, or coating, further reducing the need for high-retention internal preservative treatments. Other panel products used for similar applications—such as MDF, plywood, and particleboard—do not have such mandatory penetration tests and instead follow performance-based durability evaluation. Requiring borax treatment and spot testing places block boards at a competitive disadvantage, despite the availability of safer and more efficient preservatives like bifenthrin, fipronil, chlorpyrifos, and nano-based formulations.

Moreover, the Mycological Test already included under Clause 9.2.4 of IS 1659 evaluates the biological resistance of the product and ensures protection against fungal degradation. This test is a more appropriate and performance-based indicator of treatment effectiveness, rendering the spot test redundant.

c) Suggested Revisions

To align IS 1659 with current manufacturing practices and actual use scenarios, several important revisions are recommended. First, the existing clause mandating veneer treatment with boric acid or borax should be made flexible by allowing alternative methods such as glue-line poisoning (GLP) or core strip treatment. These approaches are more practical, effective, and widely used in industry today. Preservation requirements should also be determined based on the intended application of the blockboard. Furthermore, the standard should recommend treating the solid wood core strips, which are particularly prone to biological attack, to enhance the overall durability of the product. Lastly, the standard should formally recognize glue-line poisoning as an effective and validated technique for providing biological resistance in blockboards, ensuring that regulatory provisions are consistent with proven industry methods.

4. Environmental Considerations: End-of-Life of Treated Panels

As the demand for wood-based panels continues to rise, so does the volume of preservative-treated products entering the waste stream at the end of their lifecycle. While treatments such as ACC, CCB, and creosote significantly improve the durability of plywood and blockboards during service, their environmental implications post-use remain largely unaddressed in most Indian standards and industry practices.

When treated panels are disposed of in open landfills, chemicals such as chromium, copper, arsenic, or creosote oils can leach into the ground, contaminating soil and groundwater. Similarly, incinerating treated wood, especially without proper emission control systems, can release toxic fumes and heavy metal residues into the air, contributing to serious health and environmental hazards. To mitigate the environmental risks posed by treated wood panels and align with international environmental safety standards, the following sustainable practices and policy interventions are recommended: it is critical to shift toward more environmentally friendly preservative systems. Preservatives should be applied only when necessary, and in doses optimized for the specific application to avoid overuse. For short-term or low risk uses, untreated wood should be preferred to minimize chemical exposure and environmental impact. Additionally, consumers should be provided with the option to choose between treated and untreated wood, based on their needs and intended use.

5. Conclusion and Way Forward

Chemical treatments are essential for improving the durability and performance of plywood, but they must be selected based on end-use, safety, cost, and environmental impact. As India's wood-based panel industry grows to meet demand for sustainable and cost-effective materials, the need for modern, efficient preservative practices is more urgent than ever. However, current BIS standards—such as IS 303, IS 4990, IS 710, and IS 1659—continue to mandate outdated methods like pressure impregnation and boric acid dipping, which are increasingly incompatible with present-day manufacturing.

Considering the detailed evaluation of the existing standards and their practical limitations, the following key recommendations are recommended to modernize preservative treatment practices for wood-based panels in India. First, the standards should be updated to include

widely adopted in-process methods such as glue-line poisoning, core strip treatment, and protective overlays, replacing outdated veneer dipping requirements. Emphasis should also be placed on the use of low-toxicity preservatives such as borates and pyrethroids, with a gradual move away from heavy-metal-based systems. Clear labelling on treated products, specifying preservative type and safety instructions, should be mandated to inform users and handlers. Finally, end-of-life considerations must be integrated into the standards by promoting environmentally sound disposal, recycling, or detoxification pathways for treated wood waste.

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Production & Quality Excellence Tour, Vietnam

Dates: 8th – 10th April 2025

Organized by: Federation of Indian Plywood & Panel Industry (FIPPI)

Participants:

1. Dr. M.P. Singh from FIPPI
2. Smt. Sujatha Dhanapal from IWST
3. Shri Prakash Vijaykumar from IWST
4. Dr. Purosottam Kumar Sharma from Greenpanel
5. Shri Nishikant Mishra from Greenpanel
6. Shri Sharda Kumar Tiwary from Duroply
7. Shri Hemant Sharan from Greenply
8. Shri Jagannath Das from CenturyPly

Introduction

The Vietnam Production and Quality Excellence Tour, conducted from 8th to 10th April 2025, focused on gaining first hand exposure to plywood manufacturing techniques, adhesive technologies, and export-ready furniture production models. The visit covered four key facilities, each demonstrating unique strengths in efficiency, sustainability, and scalability. The core objective was to study cost-effective methods of working with high-moisture core veneers, advanced glue formulations, and scalable models applicable to the Indian plywood industry.

Tour Highlights and Daily Summaries:

Day 1: 8th April, 2025 Glue Factory – Loc Phat Group Joint Stock Company

Location: Vietnam

Summary:

FIPPI members reached the Loc Phat Glue Factory to explore advanced adhesive technologies suited for high-moisture core veneers. The visit focused on eco-friendly resin formulations that meet global standards, with key insights into ammonium chloride-based bonding solutions that enhance strength and sustainability.

Discussion Points:

- Focus on UF resin formulation (E0, E1, E2 grades) for high-moisture core veneers.
- Use of ammonium chloride (NH_4Cl) as a hardener at the final stage to improve bonding performance.
- Controlled resin production process involving pH regulation, reflux heating, and cloud point testing.
- Resin preparation includes formalin, melamine, urea, PVA, and liquor ammonia.
- Ensures compatibility with high-moisture veneers and compliance with global emission norms.
- Shelf life of resin ranges between 5 to 20 days, depending on the grade.
- Differentiation from Indian practices through advanced glue formulation techniques.

Day 2: 9th April 2025 – Visit to Benchmark Industries

Location: Vietnam

Summary:

FIPPI members arrived at Benchmark Industries to explore cost-efficient plywood production using high-moisture veneers. The visit showcased a fully automated continuous line and highlighted material savings of 3–4% through optimized glue usage. The factory's lean, preservative-free process reflected a strong focus on efficiency and sustainability.

Discussion Points:

- Specialized in cost-efficient plywood production using high-moisture veneers without preservatives or additives.
- Achieved 3–4% savings in core veneer material through optimized glue and moisture control.
- Operated a fully automated, continuous line manufacturing process.
- Promoted lean manufacturing and rapid throughput with minimal environmental impact.

Day 3 (Morning): 10th April 2025 – Visits to Woodlands Industries & Tri Khoi Film Face Plywood Factory

Location: Vietnam

Summary:

FIPPI members arrived at Woodlands Industries to explore the advanced production processes and technologies in place, with a particular focus on the manufacturing of plywood, furniture, and specialized wood products using a variety of hardwood species. The visit offered insights into integrated operations, in-house

resin production, and export-grade finishing techniques.

Discussion Points:

- Manufacturing of plywood, furniture, and engineered wood products using hardwood veneers (Acacia, Eucalyptus, Styrax, Manglietia).
- Veneer thickness of 1.7 mm, with moisture maintained at 14–16%.
- Use of veneer dryers for high-moisture veneers (up to 30% moisture).
- In-house production of UF, MUF, and PF resins using formalin, melamine, PVA, and ammonia.
- Construction of 7-layer plywood, including birch and Sapeli face veneers.
- Use of hot melt pin staplers during assembly.
- UV and oil coating for improved durability and export finish.
- Manufacturing of CLT and GLT panels for IKEA and other international markets.
- Workforce of 36 across four continuous production lines.

Day 3 (Afternoon): 10th April 2025 – Tri Khoi Film Face Plywood Factory

Location: Vietnam

Summary:

FIPPI members visited the Try Khoi Film Faced Plywood Factory to assess its manufacturing processes, technological capabilities, and operational efficiency. The focus was particularly on the mat plywood production line utilizing Acacia wood veneer, where members observed sustainable practices, optimized resource utilization, and manual techniques contributing to consistent quality in a low-investment setup.

Discussion Points:

- Production of film-faced plywood using Acacia veneers.
- Continuous conveyor belt system for mat plywood production.
- Utilization of all veneer grades with patchwork techniques to minimize waste.
- Manual preparation of putty using calcium carbonate, UF resin, Maida, and hardener.
- Application of black film face overlay for aesthetic and durability.
- Hot pressing system with stainless steel plates and rubberized fabrics for heat distribution.
- Parameters used: 136°C temperature, 10 minutes pressing time, 9 MPa pressure.
- Manual hot press loading system.
- Final product (12mm, 8x4 sheet) weighs 21 kg.
- Emphasis on sustainable production and manual efficiency suitable for low-investment manufacturing.

Conclusion and Key Takeaways

The Vietnam tour successfully highlighted efficient and sustainable practices in plywood and adhesive manufacturing. It showed that high product quality can be achieved through both automated and manpower-based systems, depending on the scale. Key takeaways included the importance of using eco-friendly E0-grade resins, managing high-moisture veneers without heavy drying, integrating in-house adhesive and finishing processes, and replicating scalable models like Tri Khoi's for cost-effective production. These insights offer valuable direction for improving operations in the Indian plywood industry.

Recommendations and Further Improvement

- Introduce Automation in Manual Areas: Factories like Tri Khoi could benefit from partial automation in areas like hot press loading, which would improve throughput without large capital investments.
- Continuous Skill Development: Periodic training for production staff on glue handling, veneer treatment, and quality assessment can help maintain consistent standards.
- Invest in R&D for Resin Innovation: Customizing adhesive formulations based on regional moisture and wood types will ensure better bonding and durability.
- Strengthen Supplier Collaboration: Establishing long-term relationships with film, resin, and machinery suppliers may lead to innovation in raw material quality and cost control.
- Replicate Tri Khoi's Model in India: Small to mid-sized Indian plywood units should pilot Tri Khoi's manpower-based, low-cost model to address both scalability and affordability in semi-urban clusters.

Visual Highlights from the Production & Quality Excellence Tour

Sun drying of veneers.

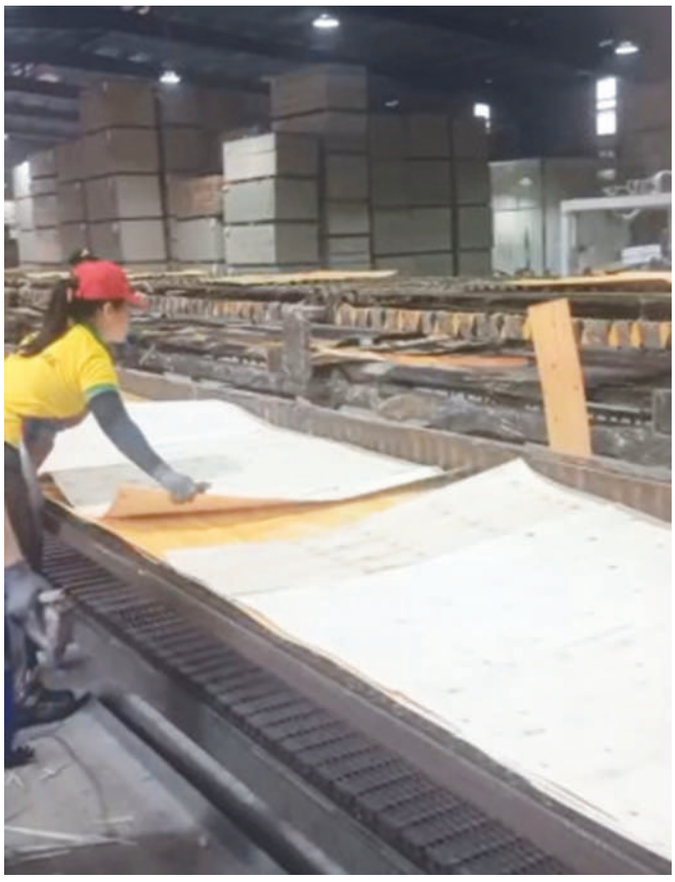
Vertical stack dryers.

Rolls supplying bottom and top layer of the mat.

Assembling lines with veneer rolls (for top and bottom layer).

Grinding of veneer edge for lap jointing and marking for seamless joint.

8 x 4 core veneers for manual laying on the base veneer.



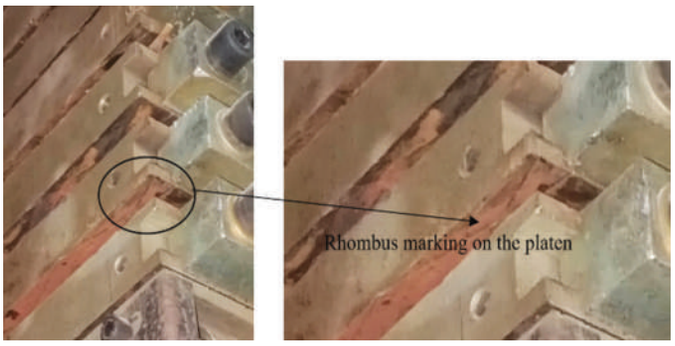
Assembling and pneumatic nailing of plastic pins.

Assembly of mat with glued and non-glued veneers.

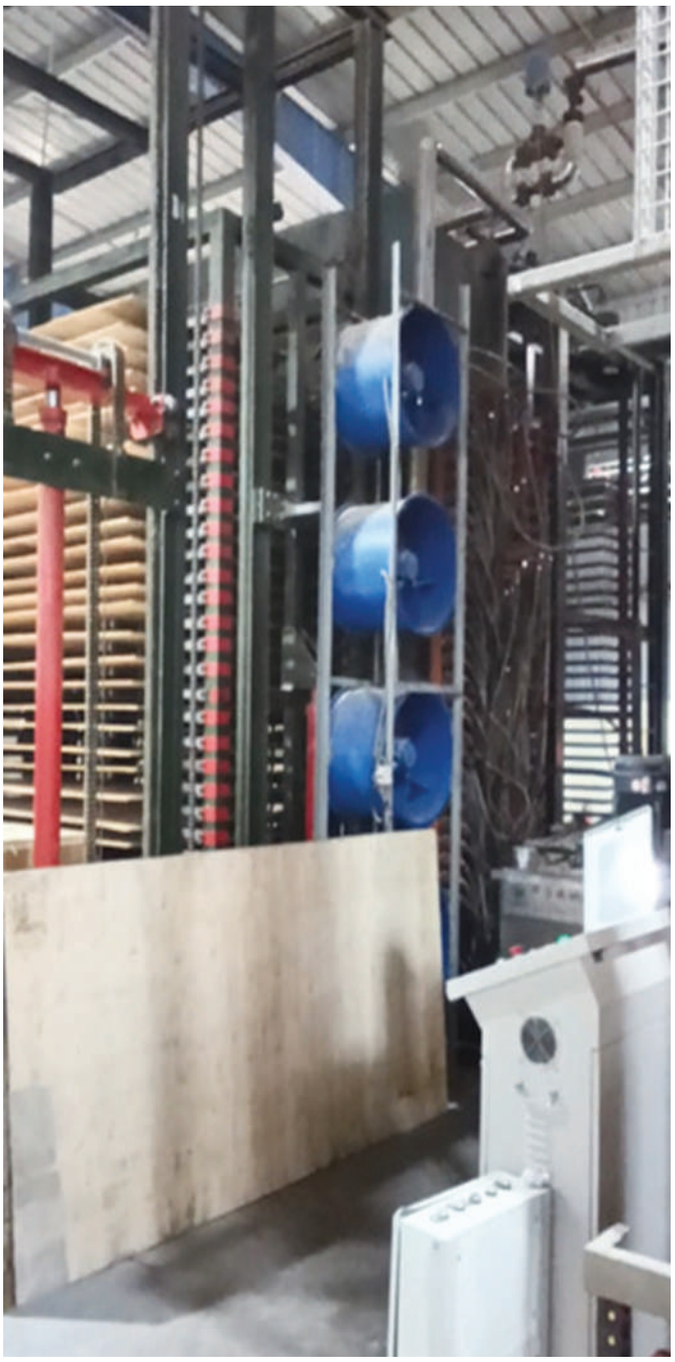
Assembling lines without veneer rolls and gluing of 4 x 4 veneer.

Trimming of core mats and Prepressing of the core mats.

Hot press with automatic loader and unloader.



Rhombus pattern carved in the platen for moisture release and compaction



Unloader equipped with inbuilt blowers to cool the panel after unloading.

Hot press equipped with individual inlet and outlet valves.

Application of Putty.

After application of face veneer (Birch)

Trimming and Sanding

Minor patching after sanding.

Stacking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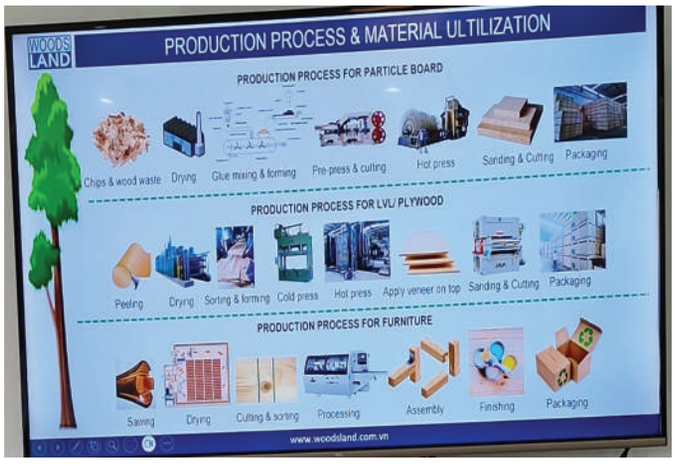
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FIPPI Sub-Committee meeting for the Review of Draft on Fire Retardant MDF and Particle Board

Members Present:

- Dr. C.N. Pandey, Senior Technical Advisor, FIPPI
- Dr. M.P. Singh, Director General, FIPPI
- Dr. Purushottam Sharma, M/s. Green Panel Industries Ltd.
- Dr. Mamatha Singh, Scientist, IWST Bengaluru
- Shri Rajeshwar Nair, M/s. Balaji Action Buildwell Pvt. Ltd.
- Shri G.S. Achary, Century Plyboard Ltd.
- Shri Vinay Chaturvedi, Century Plyboard Ltd.
- Shri Sumit Roy, M/S Century
- Shri Ramesh Vishwanathra, Greenlam Industries Ltd.
- Dr. Richa Bansal, Senior Research Analyst, FIPPI
- Shri Anthony Fernandes, Office Secretary, FIPPI

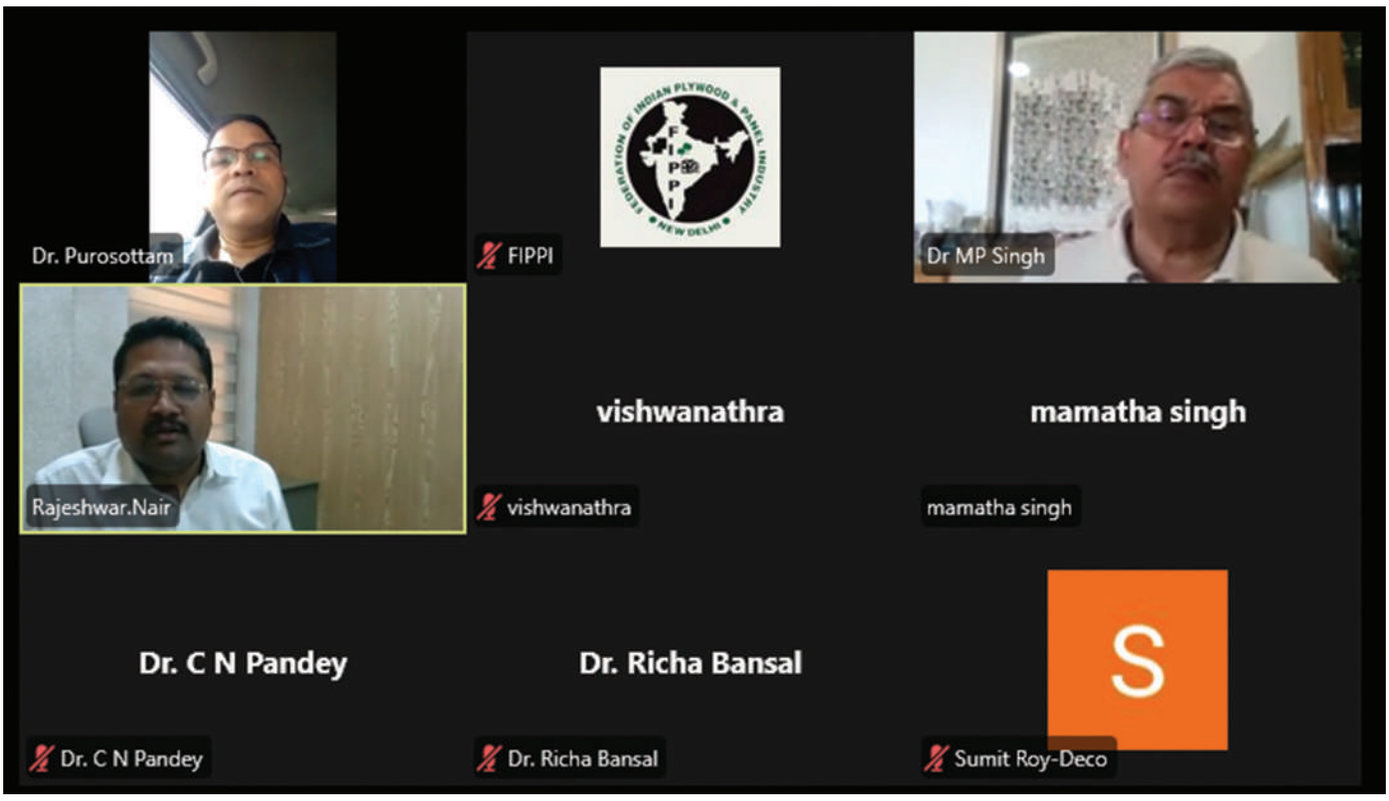
The Federation of Indian Plywood & Panel Industry (FIPPI) convened an online meeting on April 3, 2025, to review and discuss the draft formulation of the standard for Fire Retardant Medium Density Fibreboard (MDF) and Particle Board. The meeting brought together leading industry experts and scientists to share their insights and contribute to the development of the standard.

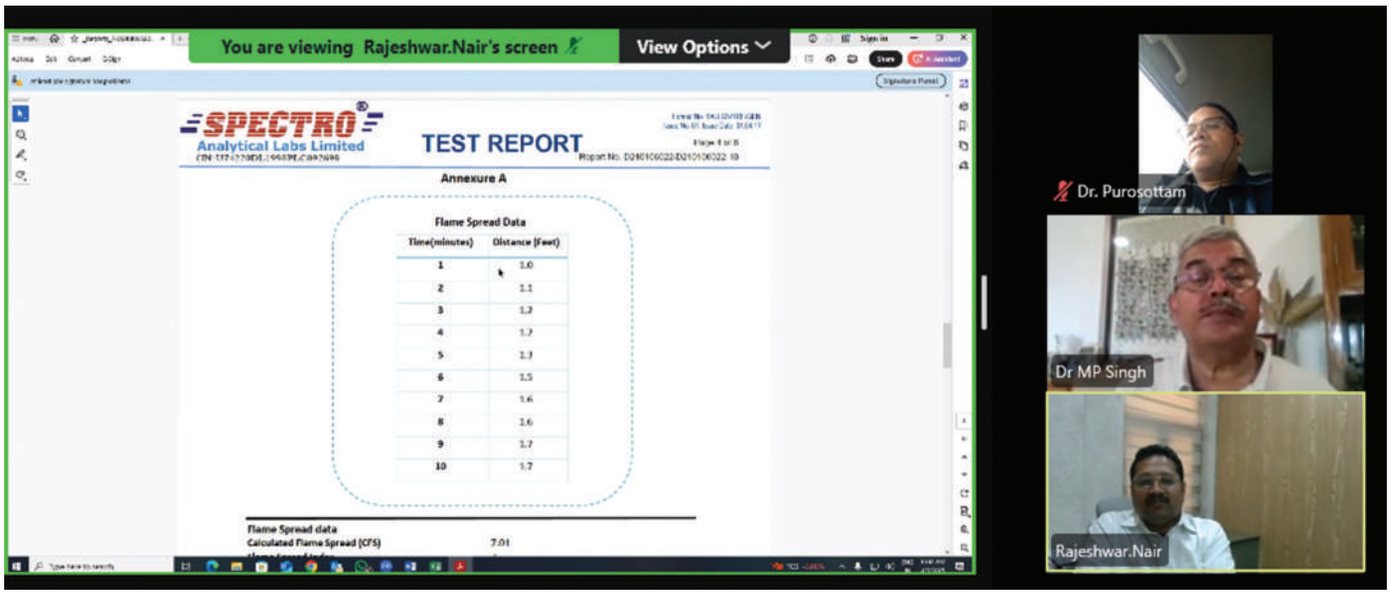
The first agenda of discussion was the testing of fire retardant MDF and particle board. Dr. Mamatha highlighted that at present there is no testing facility at IWST to test the fire retardant MDF and particle boards and emphasized on the need to establish a dedicated fire testing laboratory at the institute. Shri Rajeshwar Nair supported this suggestion, recognizing the importance of such a facility for advancing the standardization process.

Dr. Mamatha recommended that a clause for smoke suppression chemicals and their percentage limit should also be incorporated in the standard. If the chemical is added more than the required amount, it may lead to a loss in strength. She emphasized that the quality of the boards should be maintained along with providing fire resistance. She further suggested that the manufacturers should be given some liberty on the choice of fire-retardant chemicals as long as they meet the required performance criteria.

Since IWST currently does not have a fire testing facility, it was proposed that all samples should be tested externally. After comprehensive data is collected from these tests, the committee can proceed with the formulation of the standard.

Dr. Mamatha emphasized the importance of having a proper apparatus for testing the fire resistance of the boards. She said that the same sample used for testing the





physical and mechanical properties should be used for fire resistance to ensure consistency in the results. She also pointed out that the thickness of the boards is a crucial factor that significantly influences fire performance.

Shri Rajeshwar Nair and Dr. Mamatha said that we should align the Indian standard with internationally accepted norms. They proposed that the values in the standard should be specified based on the intended application and usage of the boards. Since there is currently limited data from industries that aligns with BS 476 and ASTM E84 standards, it was suggested that data from all relevant industries should be collected and analysed for this purpose.

Dr. M.P. Singh recommended that the National Building Code should be referred while drafting the standard. He also mentioned that according to the literature available, the industry should decide which values from the international standards, BS 476 and ASTM E84 are achievable. He further mentioned that a reference should be given in the standard about which value is taken from which international standard.

Dr. Mamatha proposed that the draft should address both laminated and unlaminated boards, ensuring the standard applies to a wider range of products.

Regarding thickness, the current draft limits board thickness to between 3 mm and 40 mm. Dr. Mamatha suggested that the thickness can be kept more than 40 mm. The members recommended that it should be as agreed between the manufacturer and the purchaser.

Dr. Mamatha mentioned that melamine is a highly effective fire retardant and recommended its use.

Dr. C.N. Pandey shared his views and suggested that the building code should be studied to determine whether the ASTM or BS standards are more appropriate for adoption. He suggested that the samples for physical and mechanical properties can be tested at IWST. Once the test results are available, the members can work on the development of standard. He also encouraged industries to send their samples to IWST to ensure that the data is collected and authenticated from one lab and based on the recommendations, the draft standard can be formulated.

Dr. Purushottam also suggested visiting CBRI, Roorkee which has a full-fledged testing facility for all the tests.

Dr. M.P. Singh concluded the meeting and requested Dr. Mamatha to prepare a revised draft of the standard incorporating all the points discussed during the meeting.❑

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1005, Vikrant Tower, 4, Rajendra Place, New Delhi-110008, India
Tel.: +91-11-25755649 (Direct), 25862301, Fax:+91-11-25768639
E-mail: fippi@fippi.org, Website: www.fippi.org

Minutes of Meeting: Awareness Programme on the Product Manual for IS 303: 2024 – Plywood for General Purposes & its Amendments

The Federation of Indian Plywood and Panel Industry (FIPPI) in collaboration with the Bureau of Indian Standards (BIS), organized an online interaction meeting on the 3rd April 2025 to deliberate on the Product Manual for IS 303 and its latest amendments.

Dr. M.P. Singh, Director General, FIPPI, welcomed the participants and introduced the guest speakers from BIS, Shri N Suryanarayan, Scientist F & Head – CMD-III and Shri Ashish Kumar Kanar, Scientist D, CMD-III.

Shri Ashish Kumar Kanar provided a detailed overview of the Product Manual covering the following: sampling guidelines, testing equipment requirements and the testing and inspection scheme. He also discussed about the latest amendment in IS 303 published in February 2025. He mentioned that the BIS will update the Product Manual to reflect this amendment, ensuring industry alignment and regulatory clarity.

A major point of discussion was the grouping guidelines, which currently specifies that the highest thickness of plywood shall be tested for all requirements to cover plywood of all thicknesses upto and including the thickness tested. In response, the members suggested their views as follows:

- Dr. C.N. Pandey highlighted that higher thickness plywood is less commonly manufactured. He suggested that the thickness should be optimized to give relaxation to MSMEs.
- Dr. Purushottam also suggested that an ideal thickness such as 12 mm should be kept for testing.
- Shri Moiz Vagh agreed to the above suggestions and said that higher thickness plywood is manufactured depending upon the requirements.
- Shri Sonu Aggarwal recommended that each factory should declare the thickness they are manufacturing regularly.
- Dr. M.P. Singh suggested that the critical and non-critical parameters should be identified and suggested that declaration from the manufacturer should be taken.

In response, Shri Ashish Kumar stated that high thickness is kept to ensure the capability of the manufacturer to manufacture the entire range.

The grouping guidelines specify that the manufacturer should declare the type of preservative treatment. To address this, Shri Moiz Vagh suggested that the preservative treatment should not be mandatory. Dr. C.N. Pandey supported this suggestion and said that the sapwood of most timber species used in plywood manufacturing is non-durable. From the last 30 years, glue line treatment is used which should be considered equivalent to preservative treatment.

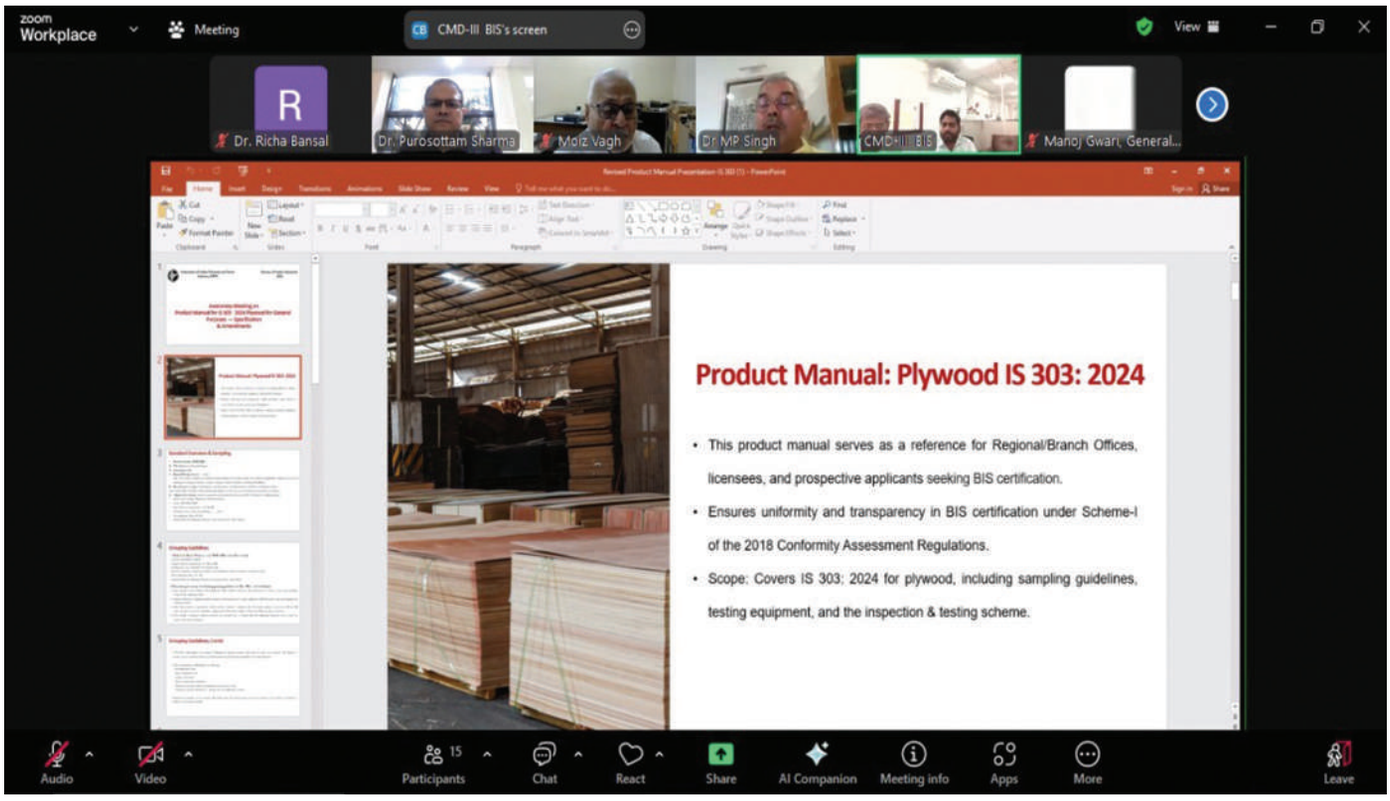
The guidelines stipulate that one sample of each Grade & Formaldehyde Class shall be tested for all requirements in order to cover that particular Grade & Formaldehyde Class. Dr. C.N. Pandey proposed that testing the highest grade should be sufficient to demonstrate the manufacturer's competence across lower grades. For e.g. if BWP grade is tested, it indicates the capability to manufacture both BWR and MR grades of plywood. He emphasized that more samples for testing leads to more burden on the manufacturers.

Regarding the declaration of testing protocols, it was discussed that the sampling frequency and lot details should be provided by the manufacturer as in their Quality Assurance Programme (QAP), and must be followed by them. Shri N. Suryanarayan clarified that the manufacturer can declare their own testing frequency based on their confidence level. During the inspection, BIS will verify the test records of the company to ensure consistency.

Shri J.K. Bihani raised concerns that there is a huge gap among MSME units and suggested that some relaxation should be given to the micro industries.

Dr. M.P. Singh mentioned that there should be a system for critical and non-critical parameters in the Product Manual. He suggested that a staggering can be done based on the priority of that parameter and compliance requirements.

The next agenda for discussion was the recent amendment in IS 303 published in February 2025. Shri Ashish Kumar explained that each grade of plywood will now be further classified into bending classes: F10, F20, F30, F40 and F50. The surface of plywood shall be of three types A, B and C based on the appearance. Plywood of both C type surfaces shall be used only in applications where the plywood is covered by other materials like foam/upholstery. The amendment also introduces a revised framework for strength requirements, with average



Modulus of Elasticity (MOE) and Modulus of Rupture (MOR) values defined by bending class. Formaldehyde emission testing under the perforator extraction method is mandatory for all classes under IS 303 and the test should be done for each grade of product. The marking clause in the latest amendment includes the bending class along with other marking requirements.

The members raised several queries to clarify and enhance their knowledge on this agenda. Shri Suresh Bahety asked that is there any relaxation if the plywood is marked as F20 and it passes the strength requirements of class F10. In response, Shri N. Suryanarayan clarified that this is not permissible and the manufacturer has to ensure that the product is meeting the minimum strength requirements as given in the standard. Actual MOR/ MOE (Bending Class) parameters should be higher than the declared values to avoid failure of sample and non-conformity.

Shri Sonu Aggarwal suggested that instead of licence cancellations, penalty should be imposed on the manufacturer in case of violation of any norms. BIS clarified that enforcement actions are not limited to manufacturers alone; violations by dealers and online platforms are also punishable. BIS also clarified that the licence is issued to manufacturer and not dealer and the manufacturer should declare a specific brand, if it is put by the dealer.

Concerns were also raised regarding the disposal of non-conforming or rejected materials. Dr. M.P. Singh emphasized the need to address the issue of rejected or the non-conforming material. Shri Vaidyanath also pointed that we should think about the non-conforming and rejected material which often end up being sold at lower values and discounts in the market.

In response, BIS clarified that the manufacturer is not allowed to sell non-conforming products in the market and after the material is rejected, the ISI mark has to be removed from the product. The manufacturer should find out ways to dispose the rejected material. BIS also insisted that in order to have less rejections, manufacturers must work toward improving their production processes.

Another query raised by members was regarding plywood products bearing the ISI mark that are imported into India and proper monitoring of their quality. In response, BIS clarified that they have established protocols for inspection of such cases. Samples are taken from the port for which BIS has their own testing frequency. Based on the results of testing, action is taken against such manufacturers if imported samples fail to meet the required standards.

In conclusion, Dr. M.P. Singh, requested every association and its members, to share their concerns and suggestions during the CED 20 meeting, for the required necessary amendments. He extended his gratitude to Shri N. Suryanarayan and Shri Ashish Kumar Kanar for providing clarity on several aspects of the Product Manual for IS 303 and its recent amendments. The members requested that the thickness of plywood as specified in the product manual should be considered and an optimum thickness should be declared.❑

FIPPI's Proposal for Revision of Preservative Treatment Norms in IS 4990:2024 for Shuttering Grade Plywood

FEDERATION OF INDIAN PLYWOOD & PANEL INDUSTRY

REGISTERED UNDER THE SOCIETIES REGISTRATION ACT XXI OF 1860, REGN. NO. S/2985/1968-69 DT. 4.1.1969

1005, VIKRANT TOWER, 4, RAJENDRA PLACE, NEW DELHI110 008, INDIA
Phone No.: +91-11-2575 5649 • **E-mail:** fippi@fippi.org • **Website:** www.fippi.org

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FIPPI/16/3-2025 May 19, 2025

To,

Shri Pradeep Singh Shekhawat
Joint Director and Scientist 'D',
Civil Engineering Department,
Bureau of Indian Standards,
9, Bahadur Shah Zafar Marg,
New Delhi 110 002.

Subject: Proposal for Review of Preservative treatment in IS 4990:2024 – Plywood for Concrete Shuttering Works.

Dear Sir,

With reference to the inputs submitted earlier on April 1st, 2025, regarding the revision of retention norms of IS 4990:2024 – Plywood for Concrete Works – Specification, we are pleased to submit our first draft proposal of the preservative retention requirement of IS 4990 for your consideration.

A copy of the draft proposal with the proposed amendments and provision for the preservative retention clause is attached herewith for your reference.

It is requested that this proposal be considered for deliberation and possible adoption in the upcoming revision of IS 4990.

Thanking you,

Dr. M. P. Singh
Director General,
Federation of Indian Plywood and Panel Industry (FIPPI)
New Delhi

Copy for information:

1. Director IWST cum Chairman, CED 20

Proposal for Review of IS 4990 – Shuttering Grade Plywood (To be discussed in the upcoming CED-20 Meeting)

1. Agenda

Plywood used for concrete shuttering must adhere to the requirements laid out in IS 4990, particularly with respect to construction details, surface finish, and flexural properties—all of which are currently well-aligned with international practices. However, it is proposed that the existing requirement for preservative treatment—specifically, the chemical retention level of 12 kg/m^3 be reviewed and reconsidered.

2. State of knowledge and Issues

For any preservative treatment of plywood, following parameters have to be assured:

1. Depth of preservative chemical penetration.
2. Uniform distribution of preservative chemicals throughout the panel.
3. Total loading of chemicals as required for a particular grade of plywood depending on its end use environment (Use Class)
4. Service Life of the product.
5. Suitability of the preservative process or method of treatment

There are a good number of BIS specifications for preservative treatment of wood and wood based panel products. Out of these, IS: 5539 is the only one specific for preservative treatment of plywood. This specification states that "Plywood can be given preservative treatment by the same methods as are used for solid wood" (Clause 0.3 of Forward). IS: 5539 also states that "where maximum protection is required, plywood should be completely penetrated by the preservative so that no untreated wood is left exposed when the sheet is cut or drilled in use" (Clause 0.3 of Forward).

When a finished plywood is given preservative treatment by the same method as that applicable for solid wood, preservative in solution can enter into plywood: (i) up to first glue layer through face veneer and (ii) a few centimeter into plywood through plywood edges. Preservative cannot reach into interior of plywood as required for thorough and uniform concentration of preservative chemicals throughout the plywood. Hence, purpose of preservative treatment is defeated if a finished plywood is given treatment by the same method as used for solid wood. However, due to non- availability of naturally durable timber, plywood is made from non-durable timber of plantation origin and hence all plywood, specially, for outdoor uses, require preservative treatment although chemical retention will vary with environment of end uses and expected Service Life of the product.

Preservative chemicals suggested in IS: 401 are proven with time. But the method of treatment by dipping or pressure impregnation are not suitable for plywood. Only veneer treatment as suggested in IS: 5539 is applicable for plywood. But for IS: 4990 (Shuttering ply) which at present require higher retention of chemicals like Copper salt (as suggested in IS: 401) is required, veneer treatment is not suitable as higher concentration of copper salt on veneer will interfere in bonding of veneer with adhesive, whereas we underline the essential properties for shuttering plywood as:

Structural Integrity: The plywood must be strong enough to support the weight of the wet concrete and withstand any loads during placement and curing without deforming.
Stability: It should be stable enough to maintain its shape and position throughout the concrete pouring process. Adequate bracing and support systems are necessary to prevent movement.
Waterproofing: The plywood should prevent water loss from the concrete mix. This helps in achieving the desired strength and durability of the concrete.
Smooth Finish: The inner surfaces of the plywood should be smooth to ensure a high-quality surface finish on the concrete. Rough surfaces can lead to defects.
Reusability: Ideally, plywood should be reusable for multiple projects, which can significantly reduce costs.
Compatibility with Concrete: The materials used for formwork should be compatible with concrete to avoid chemical reactions that could affect the concrete's properties.
Cost-Effectiveness: The design and materials should be economically feasible, considering both initial costs and lifecycle costs.
Safety: The formwork must be designed to ensure the safety of workers during installation, pouring, and removal.
Thermal Insulation: In some cases, the formwork should provide thermal insulation to ensure proper curing of the concrete, especially in extreme weather conditions.

Because of the higher retention of preservative chemicals required for shuttering ply (12 kg/m3) (IS: 4990) and the prescribed method of treatment (pressure impregnation as per IS: 4990 and IS: 401), no manufacturer can use BIS prescribed method of treatment for shuttering ply. The practical problems faced are: (i) distribution of chemicals are non-uniform throughout the panel – more on surface and edges, less in interior of central portion, (ii) If treatment process is made longer to achieve higher loading, much of the chemicals will be retained on surface, which gives ugly look of plywood surface and difficulty in its overlaying, (iii) preservative treated plywood gets

warped on drying after treatment and remains no more a useful material, (iv) very often glue bond gets affected due to high and alternate pressure and vacuum during pressure impregnation treatment, (v) IS: 401 and IS: 12120 suggest that exposed end after cutting and drilling has to be coated with preservative solution, is not always practical and unknown to carpenter – thus leaves the exposed end vulnerable to attack by borer and fungus.

In fact, plywood industry has been using many potential organic insecticides as glue line poison as preservative in plywood. IS: 12120 has also recommended use of glue line poison in preservative treatment of plywood (Amendment 2, August, 2002, Clause 5.5) in for Coated Shuttering Plywood (CSC) and Film-Faced Shuttering Plywood (CSFF) and give a final dip treatment in finished plywood in BIS recommended preservative solution of inorganic chemicals for plain shuttering plywood (CS type). The lethal dose and minimum retention of each chemical for glue line poisoning of shuttering plywood have been worked out through experimentation in consultation with chemical manufacturers. This process is working fine for making shuttering plywood for last 20 years in India. However no standard values have been incorporated in IS 4990.

Proposed Amendment with respect to the preservation treatment

A comparative study of international standards, particularly AS/NZS 1604.1:2021 (Australia/New Zealand), indicates that the hazard class system (H3 and H4) provides a more practical, performance-based, and industry-friendly approach to preservative treatment especially considering the Short Service Life of this product. In light of this, the following amendments to IS 4990 are suggested:

1. **For Coated Shuttering Plywood (CSC) and Film-Faced Shuttering Plywood (CSFF):** Adoption through glue-line treatment in accordance with the requirements specified under H3 Hazard Class of AS/NZS 1604.1:2021
2. **For Plain Shuttering Plywood (CS Type):** Use of water-soluble fixed-type preservative treatment aligned with the H4 Hazard Class specifications from the same standard.

This approach ensures adequate protection for plywood under construction site conditions while providing flexibility to manufacturers and better alignment with global practices. It is requested that this proposal be considered for deliberation and possible adoption in the upcoming revision of IS 4990.

Based on the above suggestions received from the technical committee, we propose the following provision for the preservative retention clause as mentioned in IS 4990.

Current provision for retention in IS 4990	Suggested provision
Clause 10.11 **Retention of Preservative**	**Clause 10.11** **Retention of Preservative**
Plywood shall be treated as per 6.6 and shall have a retention of not less than 12 kg/m^3, when tested in accordance with IS 2753 (Part 1).	i) The shuttering plywood of plain CS type shall be treated with water soluble fixed type preservative such as ACC/CCA/CCB and shall have a chemical retention not less than 0.7 % of dry weight of wood or 3.5 kg/m^3, when tested in accordance with IS 2753 (Part 1). ii) The shuttering plywood of type CSC and CSFF shall be treated with glue line preservative chemicals such as Triadimefon or chlorpyrifos / equivalent chemical so as to achieve retention of 0.095 % based on the dry weight of wood or 0.5 kg/m^3.
Clause 6.6 The plywood after manufacture shall be given a preservative treatment as given in IS 5539 and conditioned to a moisture content not exceeding 15 percent. The preservative used shall have a copper- chrome-boron (CCB) composition or acid copper- chrome (ACC) composition, with retention of not less than 12 kg/m^3.	**Clause 6.6** i) The shuttering plywood of plain CS type shall be given a preservative treatment as given in IS 5539 and conditioned to a moisture content not exceeding 15 percent. The preservative used shall have a copper-chrome-boron (CCB) composition or acid copper- chrome (ACC) composition, with retention of not less than 0.7 % of the dry weight of wood or 3.5 kg/m^3 through dip (hot and cold) treatment of the finished plywood panel. ii) The other two types of shuttering plywood which are CSC and CSFF shall be treated with glue line treatment using Triadimefon or similar preservative chemicals such as chlorpyrifos/equivalent chemicals with retention of 0.095% based on the dry weight of wood or 0.5 kg/m^3. No additional preservative treatment is required as the overlays of phenol or creosol formaldehyde resin, itself offers sufficient protection during use.

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FIPPI Urges DPIIT to Streamline QCO Compliance for Resin Use in Plywood Manufacturing

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1005, VIKRANT TOWER, 4, RAJENDRA PLACE, NEW DELHI110 008, INDIA
Phone No.: +91-11-2575 5649 • **E-mail:** fippi@fippi.org • **Website:** www.fippi.org

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FIPPI/80/3-9-2025 22nd May 2025

To,

Sh. Sanjiv
Joint Secretary
Department for Promotion of Industry and Internal Trade (DPIIT)
Ministry of Commerce & Industry
Government of India
Vanijya Bhawan, New Delhi.

Subject: Comments on Draft Synthetic Resin Adhesives Synthetic for plywood (Phenolic and Aminoplastic) - Specification (Quality Control) Order, 2025 – Request for Exemption for Captive Use in Plywood manufacturing units having BIS license mandatorily.

Reference: Meeting Notice dated 14.05.2025 – Stakeholder Consultation on 21st May 2025.

Sir,

With reference to the above-mentioned stakeholder consultation meeting on the Draft Synthetic Resin Adhesives (Quality Control) Order, 2025, it was discussed that the Quality Control Order shall be applicable to synthetic resin adhesives as well as to plywood and other panel products. This implementation, however, may impose an undue burden on plywood industries as a significant portion of synthetic resin adhesives, particularly those conforming to IS 848:2006, are manufactured and used captively by plywood industries for their day-to-day production. These adhesives are not intended for sale in the open market but are consumed internally during the manufacturing of wood-based panels. In contrast, there are other units that solely manufacture and market resin/adhesives to the panel industry.

We would like to bring to your kind notice that Synthetic Resin Adhesives (Quality Control) Order, 2025 implies that the adhesives should comply with cyclic boil dry test requirements corresponding to the grade of plywood. Additionally, tests such as shelf life, pot life, and pH are included to assess the quality of resin stored for long periods. The shelf life and pot life of adhesives are important when they are stored for extended periods, as this may affect bond integrity. However, the critical parameter to assess bond quality is the cyclic boil water resistance test. Plywood made using specified resin formulations and manufacturing parameters is subjected to this test, as required under IS 303, IS 4990 and IS 710 for the final product, all of which are covered under QCO 2024 for Plywood.

Importantly, the key parameter for bond quality or integrity of the final product is the water resistance test as specified in IS 303 for each grade of plywood (MR, BWR, BWP) under clause 11.3.1. Since water resistance test in the final plywood is mandatory and subjected to quality tests which are already covered under applicable QCOs,

imposing mandatory BIS certification for adhesives used solely within such integrated production units may result in unnecessary duplication of regulatory compliance, increased cost and operational burden on the manufacturers, without any benefit in **product quality assurance.**

In view of the above, it is sincerely requested that a suitable exemption may be considered in the final Quality Control Order for synthetic resin adhesives, specifically exempting adhesives manufactured and used captively within integrated production units, where the end-products (e.g., plywood) are already mandatorily standard certified under the applicable Quality Control Orders.

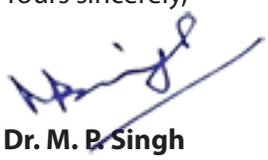
Please consider the following proposed exemption clause to be included in the Quality Control Order for IS 848:

However, adhesives manufactured and solely used captively within integrated plywood production units mandatorily having BIS licensing (as applicable under Quality Control Order 2024) shall be exempted from the additional requirements of this Quality Control Order"

We believe that the above inputs and proposed clause for exemption will be duly considered during finalization of the Quality Control Orders.

Thanking you.

Yours sincerely,



Dr. M. P. Singh
Director General,
Federation of Indian Plywood and Panel Industry (FIPPI)
New Delhi

Copy to:
Sh. Pramod Kumar Tiwari Director General,
Bureau of Indian Standards (BIS) New Delhi

FIPPI Proposes Comprehensive Amendments to IS 1659 for Block Boards

In line with the proceedings of the thirty-third meeting of the Sectional Committee on Wood and Other Lignocellulosic Products, CED 20, and the discussion under Item 3 – Finalization of Drafts under Wide Circulation for Amendments to Indian Standards – FIPPI convened an internal meeting to deliberate on the proposed revision of IS 1659: Block Board Specification. Based on recommendations from the FIPPI Technical Committee and with the objective of harmonizing IS 1659 with other relevant Indian Standards, FIPPI proposed the following suggestions.

1. Inclusion of Additional Bending Strength Class – F10 along with F30 and F50

In the draft amendment no. 3 for block boards, a new clause 4.4 for bending class has been added according to which:

In terms of bending class, each grade and type of block board shall be further classified in bending classes as follows:

a) Bending Class F30; and

b) Bending Class F50.'

However, it is noted that IS 303 (Plywood for General Use) has been recently amended to include a new F10 bending class to accommodate the use of diverse timber species from different parts of the country. Considering a similar diversity of raw materials in the manufacture of block boards, especially with the increasing use of agroforestry timber, it has been proposed that the standard should also include the F10 class. Therefore, there should be a provision for three bending classes F10, F30 and F50.

Table 1: Suggested Average Values of Modulus of Elasticity (MoE) and Modulus of Rupture (MoR).

Sl. No.	Properties	Bending Class (F)	Requirements (N/mm^2)
1.	Modulus of Elasticity (MoE), N/mm^2, Avg., Min. Along (direction parallel to the grain direction of the top veneer)	F10 F30 F50	1000 3000 5000
2.	Modulus of Rupture (MoE), N/mm^2, Avg., Min. Along (direction parallel to the grain direction of the top veneer)	F10 F30 F50	10 30 50

2. Modulus of Elasticity (MoE) and Modulus of Rupture (MoR) requirements

The current MoE and MoR requirements as per the draft amendment 3 for block boards specifies the values for both along and across the grain. The new recommended values based on the three bending classes are given in Table 1. It is also recommended that the values along the grain direction (and not across the grain) only should be considered for classifying the block boards under bending class F10, F30, and F50.

3. Addition of BWR grade along with the MR & BWP grades of block boards

The possibility of including BWR grade in the clause 4 "Grades and Types" along with the MR and BWP grades should be considered. This has been suggested keeping in view the classification as given in IS 303: General Purpose Plywood. The inclusion of the BWR grade will allow manufacturers to cater to the requirements of the market and fulfil customer demands.

4. Preservative Treatment: Addition of Glue line treatment along with provision for treatment with other water-soluble chemicals

The current clause 6.1 for preservative treatment in IS 1659 specifies that: Species of timber marked with (*) in Annex B and Annex C and sapwood of all species, and all non-durable species shall be treated as mentioned in 1S 401. Trimmed and cut ends of a finished block board may be given a protective treatment.

In today's market block board is mostly used in panelling, making furniture like cupboards and shelves. They are further protected by lamination and edge binding. There are many substitutes of block board in the market such as MDF, plywood and particle board, which form a big market of this segment.

Keeping in view the standards for the above products, they do not have mandatory preservative treatments which are given as guidelines. Also, there are no tests given to check the treatment done. On similar grounds it is suggested that IS 1659 should be allowed to be treated by glueline poisoning and not just borax dipping and the spot test to determine borax treatment be removed. It has been proven that protection with glue line poisoning is the most economical method of doing the same. Chemicals such as bifenthrin, fipronil, nano preservatives, and chlorpyrifos have shown effective results in this treatment process.

The following requirements for preservative treatment in plywood, particle board and MDF are given below for justification of our proposal:

A) IS 303: 2024 Plywood for General Purpose-specification

Clause 7.1.1.4. Any other type of preservative treatment may also be given to plywood or veneer as per agreement between the manufacturer and the purchaser, or as declared by the manufacturer.

NOTE — In case of any other type of preservative treatment, the same shall be declared by the manufacturer.

B) IS 3087: 2005 Particle Boards of Wood and Other Lignocellulosic Materials (Medium Density) for general Purposes — Specification

Clause 6.3. Preservative Treatment

A suitable preservative may be added to the particle mix at the time of mixing of adhesive. The following percentages preservatives are regarded as suitable:

a) Sodium pentachlorophenate: 1 percent on the basis of oven dry weight of particles, or

b) Trichlorophenol: 5 percent on the basis of resin adhesive mix

Alternatively, 2 percent of sodium pentachlorophenate or trichlorophenol inorganic solution should be applied on the surface and edges.

C) IS 12406: 2021 Medium Density Fibre Boards for General Purpose — Specification

5.4. Preservative

A suitable preservative may be added to the fibre mix at the mixing stage of adhesive. The following preservatives are regarded as suitable, and their percentage is given on the basis of oven dry weight of the fibres:

a) Sodium pentachlorophenate to the extent of 2 percent, and

b) Trichlorophenol to the extent of 5 percent.

5. Spot Test – Recommendation for revision (Clause 9.2.6)

The current clause 9.2.6 specifies the spot test "The preservative treatment when tested according to the method given in Annex K, at any given place after cutting across the entire cross-sectional area for the width of the block board shall show through and through penetration of preservative chemical".

The current mandatory requirement for spot test should be removed as the standard already includes a Mycological Test under Clause 9.2.4. It has been made clear that mycological test is to ensure protection against fungal degradation whereas treatment of wooden batten with borax and boric acid solution in water through hot and cold treatment process protects the block board from insect and borer attack. The manufacturers should be allowed to use any kind of preservative treatment as long as the block board passes the mycological test.

As per current and modern practices, industries are doing GLP and other treatments (surface and veneer) for durability of block boards, BIS may develop the test method for those chemicals as well. For the time being, a spot test should be considered as an optional test.

6. Formaldehyde Emission Test Methodology – Recommendation for Revision (Clause 9.2.7)

In the latest draft amendment for block boards, dated 27th February, a new clause 9.2.7 for Formaldehyde Content Test has been added which states that "Test of free formaldehyde content in the sample shall be done by perforator method as per IS 13745….". Based on the concerns raised regarding the appropriateness of the Perforator Method for emission testing in block boards, which typically has only two glue lines. The perforator method, based on board mass, can yield distorted results for block boards (e.g., an 18mm block board may show comparable emissions to a 6mm plywood panel, due to its lower glue content). Therefore, it is recommended to adopt the Desiccator Method for emission testing in block boards as it will give more reliable results.

7. Face Veneer Specification: Removal of the thickness requirement of face veneer and cross band (Clause 6.3.1)

Manufacturing clause 6.3.1 is not required so long mechanical and physical properties can be achieved by the manufacturer by exercising different manufacturing options. The current requirement of 0.5 mm to 1.5 mm veneer is not available in the Indian market. This also restricts the construction style of the manufacturer. The face Veneer is being entirely imported and is available in 0.2 to 0.4 mm thickness. Moreover, the thickness requirement of face veneer has also been removed in the new revision of IS 303.

Therefore, it is suggested that the restrictions on face veneer thickness criteria may be removed, and it is thereby requested to revise the clause 6.3.1 given in IS 1659. The committee noted that most block boards currently in production use agroforestry timber for the core and imported face veneers of 0.2 mm thickness. This was acknowledged as a prevailing industry practice and should be considered in the drafting of relevant specifications.

8. Tolerances in length, width and variation in thickness

Currently there is no tolerance allowed on the negative side. Negative tolerance can occur due to manual

error. The length and width do not affect the quality of the boards whatsoever and might vary due to manual error and hence the committee has proposed to add the negative tolerance limits:

Dimension	Tolerance
Length	+6 mm
	-3 mm
Width	+ 3mm
	-1 mm

The length and width tolerance suggested are based on the values given in other Indian standards.

Variation in thickness: Block boards are constructed using multiple battens and it is very difficult to control the thickness of each one of them. Secondly, the compression loss varies during press due to variation in density of different core veneers, and varying density of each core and batten it is hard to achieve variation of 0.5 mm in one single board. Therefore, it should be replaced to 1.0 mm.

9. Width of batten: Recommendation for increase in width

Clause 3.1. of IS 1659 defines block board as: A board having a core made up of strips of wood, not exceeding 30 mm in width, which may or may not be glued together and the core is glued to two or more veneers, on either side with grain direction of core and veneers running at right angles to one another.

It is proposed that the width of the batten should be allowed up to 50 mm. As fillers are dependent mostly on imported wood such as Pine which is available in approximately 38-40 mm width in general. Wider filler helps in achieving better strength properties as prevalent in other international standards to minimize unnecessary downsizing of batons from available timber. This will also help minimize wastage due to the number of cuts.

10. Removal of criteria of using only smooth core

Current Clause 6.3 for Cross Bands and Faces states that:

Veneers used for cross bands and faces shall be either rotary cut or sliced and shall be smooth. The moisture content in the veneers shall be between 8 and 12 percent.

The committee proposed to remove 'shall be smooth' for cross bands. Normally only 20%-40% of core veneer obtained is of strictly smooth quality and is hence open to interpretations. To be able to utilize all the raw material, it has been decided to make the smoothness optional as long as it does not affect the bonding strength and static bending strength.

We hope the above suggestions are given due consideration, as they reflect the current manufacturing practices, promote material efficiency, and align IS 1659 with evolving industry standards.❑

FEDERATION OF INDIAN PLYWOOD AND PANEL INDUSTRY

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Mission

To make FIPPI a robust organization representing all firms, companies, corporations, associations, and individuals engaged in the 'Plywood & Panel' industry in India nationally and internationally, promoting their interests, fostering cooperation among members, and advocating for policies and institutions to support the sector's growth, quality, competitiveness, sustainability, and stewardship.

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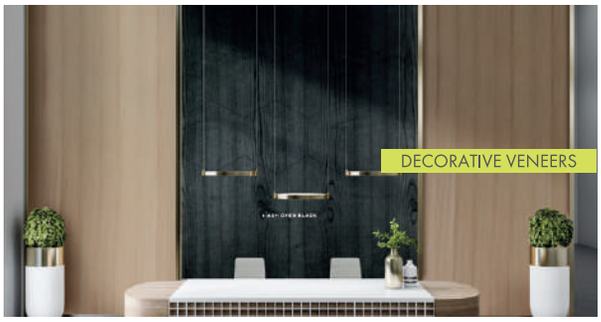

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FIPPI Response to AFMT Representation on Technical Products Overlapping with General Products under QCO

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FIPPI/AFMT-QCO-I-2025 Date: 23 June 2025

To

Mr. Amiet R. Barot
President
Association of All Furniture Manufacturers & Traders (AFMT)

Subject: Response to AFMT Representation on Technical Products Overlapping with General Products under QCO

Ref.: AFMT Representation Letter to DPIIT dated 12.02.2025

Respected Sir,

To address the points raised by AFMT, the Federation of Indian Plywood and Panel Industry (FIPPI) convened a virtual meeting on 16th June 2025, with participation from leading plywood, MDF, and particle board manufacturers who deliberated upon the issues raised by AFMT.

We are pleased to share the consolidated views and outcomes based on the discussions:

1. Most of the technical-grade value-added products are already being manufactured domestically and are available in existing inventory of the manufacturers.
2. The industry representatives have requested further clarity regarding the specific technical specifications for some of these products flagged by AFMT. The members have requested to share the detailed technical specifications or references to any relevant international standards to enable alignment with existing capabilities and help the industry in developing such products in line with market demand.
3. These value-added products are based on substrates such as plywood, MDF, and particle board, which are already regulated under the existing QCO framework.
4. In this context, several representatives opined that seeking a No Objection Certificate (NOC) for such products may not align with the intent or spirit of the current QCO framework, as the base materials are already regulated.
5. FIPPI requests AFMT to submit physical samples of the value-added products, which can be sent to BIS-accredited laboratories to determine technical conformity and enable the formulation of any necessary Indian standards.

6. The industry representatives have confirmed their preparedness to initiate production of the relevant products based on AFMT's specifications and anticipated demand.

Please find attached the Minutes of the FIPPI meeting held on 16th June 2025 for your consideration.

We would be pleased to participate in any follow-up discussions or provide further technical inputs as required.

With Regards,

Anthony Fernandes
Office Secretary
Federation of Indian Plywood and Panel Industry (FIPPI)

Copy to:

1. **Shri Mohammad Ishrar Ali**
   Director
   Department for Promotion of Industry and Internal Trade
   Ministry of Commerce and Industry
   Vanijya Bhawan, New Delhi – 110001

2. **Shri Pradeep Singh Shekhawat**
   Joint Director and Scientist D,
   Civil Engineering Department,
   Bureau of Indian Standards,
   9, Bahadur Shah Zafar Marg,
   New Delhi – 110002

3. **Shri. Rajesh S. Kallaje, IFS**
   Director IWST cum Chairman,
   CED 20

Minutes of Meeting (MoM) held on 16th June 2025 FIPPI Sub-Committee on Innovations and Standardization

Topic: AFMT Representation: Challenges and Opportunities for Plywood and Panel Industries on Product Innovations and Standardization

A virtual meeting was convened by the Federation of Indian Plywood and Panel Industry (FIPPI) on 16th June 2025 on the AFMT Representation requesting for No Objection Certificates in Advance for Products with overlapping of HSN Codes for Products not covered in QCO to explore the challenges and opportunities for Plywood and Panel Industries under Make in India campaign of Government of India. This meeting was attended by representatives from leading plywood, MDF, and particle board manufacturing industries of the country. The meeting began on a positive note, with participants expressing a constructive approach toward addressing the concerns raised by AFMT.

The meeting focused on discussing product specifications and standards for various wood- based products including particle board, MDF, and plywood, with participants representing different manufacturing organizations sharing their capabilities to manufacture different products and their requirements. Technical discussions covered various aspects including thickness tolerances, moisture resistance, fire reaction classes, and emission standards, with particular attention to meeting international certifications.

It was noted that most of the technical-grade value-added products are already being manufactured domestically and are available in existing inventory of the manufacturers. However, the industry representatives desired further clarity regarding the specific technical specifications of these products flagged by AFMT. In particular, they requested that either detailed technical specifications or references to any relevant international standards be shared to enable alignment with existing capabilities.

A key point of discussion was the nature of these value-added products, which are primarily based on substrates such as plywood, MDF, and particle board—materials already covered under the Quality Control Order (QCO) issued by DPIIT. In this context, several representatives opined that seeking a No Objection Certificate (NOC) for such products may not align with the intent or spirit of the current QCO framework, as the base materials are already regulated.

To facilitate a more informed response, the industry representatives requested that AFMT share physical samples of the proposed value-added products. These would be tested at BIS- accredited laboratories to determine technical conformity and enable the formulation of any necessary internal standards.

The following agendas were discussed:

1. Annexure 1: Plywood-Technical Products overlapping with General Purpose/Application Products

- The members deliberated on the technical specifications of various plywood products, with particular emphasis on thickness tolerances, surface finish requirements, and coating properties. Mr. Abhishek Kar from Greenply Industries shared that their company is already producing pre-laminated plywood, which demands a high level of manufacturing precision. The other manufacturers were encouraged to work on achieving precision calibration levels required for pre-laminated plywood production.
- Mr. Abhishek Kar from Green Ply further informed that synchronized melamine- faced plywood is also being manufactured by them. In addition, flexible/bending plywood, which has a growing market, is being produced by nearly all participating manufacturers. Other industries confirmed that they will soon start trials for synchronized melamine faced plywood to fulfil market requirements and demonstrate their capabilities to manufacture such products.
- Raw Plywood for Short Cycle Lamination and Foil lamination- The discussion also included raw plywood for short cycle lamination and foil lamination. The members confirmed that this product can also be manufactured as per the requirements of thickness tolerance of ± 0.3 mm and defect-free surfaces as outlined in the AFMT representation.
- As there is no specific standard for prelaminated

plywood and the above-mentioned products, members proposed that these variants be grouped under a unified pre- laminated plywood standard, with specific options and classifications for each type.

- Birch Plywood in Plain and Film faced variety- The discussion also covered birch plywood used in routing and toy manufacturing, noting that currently this was imported from Russia in a variety of thicknesses to meet these specialized requirements. By definition, it is generally covered under IS 303 until and unless peculiarity of products are specified for exemption.

2. Annexure 2: Particleboard- Technical Products overlapping with General Purpose / Application Products

- The discussion primarily focused on particle board products, including pre-laminated and electrostatically dissipative particle boards, with a focus on their specifications, applications, and testing requirements.
- Pre-laminated or Melamine faced or Post laminated Electrostatically Dissipative Particle board (ESA/ESD Type): The Electrostatically Dissipative Particle boards are highly specialized boards infused with charcoal, and are primarily used in the electronics industries. The end users of such boards are DRDO, ISRO, Foxconn, Bosch, etc. It was noted that the Merino Group had accepted to make this product in the previous meeting. Action Tesa also confirmed their willingness to manufacture it. However, members emphasized the need for standardized testing procedures and sample evaluations to support product development. A key challenge noted was that the charcoal infusion tends to reduce the properties of the board.
- Fire rated particle board in plain and pre-laminated variety- The members agreed that this product can be manufactured according to IS 5509. A project has already been given to IWST to develop a standard for fire-retardant particle board and MDF. The European standard can be used for guidance purpose during manufacturing such product. Dr. C.N. Pandey suggested that the industry should prepare some samples for demonstration. He also emphasized the importance of considering parameters such as length and width tolerances, thickness tolerances and resistance against moisture variation. If these criteria are met, the production of fire-retardant particle boards should pose no significant challenge.
- As per the AFMT representation, some of the furniture manufacturers require fire rated particle boards passing the B-s1, d0 Euro Class as per EN 13501-1 as well as TABLE 8 EN 13986:2006+A1:2015: EN 13501-1 D-s2, d0 with proper certifications from Global Test Houses as per EN standards only.
- Dr. M.P. Singh said that though this is a technical challenge, the industries should try to meet the above requirements. Mr. K. Pandey from Action Tesa informed that class B and C is achievable whereas class A is challenging.
- Dr. M.P. Singh encouraged manufacturers to produce samples of these products for display at upcoming industry exhibitions, such as MATECIA, to highlight domestic manufacturing capabilities.
- Dr. M.P. Singh suggested that we can work together with IWST for developing such products. A group of two-three members from each industry can be formed to work together on one specialized product to expedite the innovation, development and deployment.
- Low Density Particle board (density upto 500 kg/m3)- The members informed that there is no difficulty in manufacturing this product which is often done by flat press process.
- Plain and Prelaminated/Melamine faced particleboard as per EN 16516 or F**** emission norms and with 100% FSC or PEFC certifications- The members agreed that while achieving certain higher classification standards like F**** (super E0) would be challenging, they could focus on meeting the more widely accepted F*** standard which aligns with E0 and other international standards. The members discussed product specifications and certifications, particularly focusing on FSC certification. They confirmed that they have existing certification licenses and capabilities to produce E0 and E1 products.
- Nitrogen Excimer Energy coated decorative particleboard in veneer and PET- Mr. K. Pandey informed that this product already exists in the market. However, there is no Indian Standard for this product. Currently, Chinese Standards are being referred for reference. He also mentioned that the market demand for this product is limited and there are very few buyers who require this product.

- Dr MP Singh suggested to include all categories of overlays in the existing IS standard for Pre-laminated Particle Boards.

3. Annexure 3: Medium Density Fibreboard (MDF)- Technical Products overlapping with General Purpose/Application Products

- Fire rated medium density fibreboard (MDF) in plain and pre-laminated variety- As per the representation "Few of the Furniture manufacturers require small requirements of technical products like Fire Rated Medium Density Fibreboard passing the B-s1, d0 and B-s2, d0 Euro Class as per EN 13501-1 as well as Class A as per ASTM E84 with proper certifications from Global Test Houses as per EN and USA based standards only". Members agreed that Class B fire-rated MDF can be manufactured domestically. However, the demand of this product is low.
- Dr. M.P. Singh advised the manufactures to produce and test the fire-retardant MDF according to EN 13501 and ASTM E84 standards and check if there are any difficulties in manufacturing. He further suggested that industries should send their samples to IWST and then correlate the value obtained with IS 5509.
- Plain and Prelaminated/Melamine faced Medium Density Fibreboard as per EN 16516 or F**** emission norms and with 100% FSC or PEFC certifications- Members demonstrated their capability to produce E0 emission grade MDF/ particle boards with FSC certification. Dr. M.P. Singh requested all manufacturers to formally communicate their capability and readiness either to FIPPI or directly to AFMT/BIS. He clarified that exemptions for FSC/PEFC-certified products or for lower emission grades than E1 (which are not currently covered under Indian Standards) is not possible as IS standard mandates certain minimum values for certification with no bar on improved values or performance.
- Plain and Prelaminated/Melamine faced High Density Fibreboard (HDF) of Density 900+ kgs/ m3- The members informed that high density fibreboard products are already available in the market and there is no difficulty in manufacturing such products.
- PU/Acrylic/PET/Paper foiled Medium Density Fibreboard- Mr. K. Pandey informed that they are already selling this product in the market. However, the market response is not good. Moreover, the PET foiled MDF board is problematic.
- Pine and Whitish Rubber Wood Medium Density Fibreboard- The members addressed concerns about laser cutting marks on MDF products made from indigenous timber species, which were causing quality issues and increased costs for small-scale industries. One of the members suggested that some inhouse trials and experiments need to be carried out to achieve specific properties irrespective of the species used. Dr. M.P. Singh emphasized on collaborating with industries in Saharanpur to address the concerns of laser cutting marks on MDF. The members informed that this may be due to the high density of wood being used in manufacturing. Low density species such as poplar can be used and some trials can be done by industries to address this problem. Bhaskaran Sharma suggested that full debarking can be done to avoid black marks during laser cutting. Dr. M.P. Singh said that this type of product is primarily used by the toy and handicraft making industry and therefore, EPCH has raised several concerns regarding this issue of laser cutting marks. If the product is made, it will have a huge market potential.
- Nitrogen Excimer Energy Coated Decorative Medium Density Fibreboard in Veneer & PET- Mr. K. Pandey informed that they are selling this product in paper lamination and not in veneered lamination. If required, they can provide this product for testing. He also mentioned that the market for this product is small. Members also suggested to check whether there is any international standard for this kind of product.

Dr. C.N. Pandey informed that there should not be any separate standard for such value-added products. He requested all the industries to respond to this query and send a letter showcasing their capability to manufacture such products and provide a baseline and roadmap within a period of one week. The members agreed to the above-mentioned points and responded positively. The participants agreed that developing some of these products would require significant research and development efforts, with a focus on achieving high precision and quality standards. The next meeting has been scheduled after 1 month to get an update on the progress made in this direction.

Finally, the industry representatives agreed to revert within a week, confirming their preparedness to initiate production of the relevant products based on AFMT's specifications and anticipated demand.❑

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Trends and Dynamics of Agroforestry in India

R. K. Sapra, I.F.S (Retd)
(Former MD of Haryana State Forest Development Corporation)

The India State of Forest Report (ISFR)-2023, released by the Forest Survey of India (FSI), Dehradun, provides latest insights on the forest and tree cover in the country. The FSI has been assessing the growing stock of the Trees Outside Forests (TOF) in India under the National Forest Inventory (NFI) Programme since 2002. Initially, the country was divided into 14 physiographic zones, and 60 districts were selected for a detailed inventory over a two-year cycle. In 2016, the FSI modified the NFI's sampling design to generate state-level TOF estimates and reduced the revisit time from 20 years to 10 years. This updated design involves a grid-based system with uniform 5 km x 5 km grids, with specific grids selected each year for detailed inventory. Agroforestry, being the subset of TOF, has been estimated based on the estimates of TOF.

Areas under Agroforestry

According to the ISFR-2023, India's agroforestry area stood at 128 lakh hectares in 2023, accounting for 3.9% of the country's total geographical area. This includes 09 lakh hectares area of trees with diameter at breast height (dbh) of 5-10 cm and bamboo cover (FSI, 2023). The area under agroforestry is about 42% of the area under TOF across India. As shown in Table-1, the highest percentage of agroforestry area is found in the north-eastern region of India (4.9%), while the central and northern regions have percentage of area under agroforestry that are below the national average. The intensive agricultural cultivation in the fertile northern region and the higher proportion of forested areas in the central region explain the lower percentage of agroforestry areas in these regions.

Table-1. Zone-wise number of trees (crore*) and Volume (crore m3) of Trees under Agroforestry.						
Region	Geographical Area (lakh** ha)	Agroforestry Area (lakh ha)	Agroforestry Area (%)	Total no of trees (crore)	Total Volume (crore m^3)	Volume /tree (m^3)
Central	443	13.3	3.0	65	16.4	0.25
East	436	20.1	4.6	89	24.4	0.27
North	1011	30.9	3.1	175	26.2	0.15
North-east	253	12.5	4.9	76	9.4	0.12
South	636	28.4	4.5	263	30.9	0.12
West	508	22.4	4.4	161	21.9	0.13
Total	3287	127.6	3.9	829	129.2	0.16

According to annexure-I, Maharashtra, Rajasthan, Uttar Pradesh, Karnataka, Madhya Pradesh, Gujarat, Andhra Pradesh, Chhattisgarh, and Odisha, are the leading states in terms of total area under agroforestry. The states/UTs where more than 10% of their geographical area is under agroforestry are Lakshadweep (16.7%), Kerala (13.7%) and Meghalaya (10.5%). Over the past decade (2013–2023), the area under agroforestry has increased by 21 lakh hectares, representing a 20% rise. However, this increase is not directly comparable to the 2013 assessment, as it did not include the areas of trees with dbh of 5–10 cm and bamboo cover, which are included in the 2023 assessment. The above-mentioned states excluding Madhya Pradesh and Odisha, and additionally, Kerala has significantly contributed to the expansion of agroforestry areas during the period 2013-2023 (FSI, 2023).

Growing Stock under Agroforestry

Number of Trees

According to Table-1, there are approximately 829 crore trees under agroforestry in India in 2023, which is 77% of the number of trees under TOF across India. The southern region has the highest number of 263 crore trees under agroforestry, while the central region has the lowest, only 65 crore trees. As per Annexure-I, Maharashtra leads with the highest number of trees under agroforestry followed by Karnataka, Uttar Pradesh, Rajasthan, Tamil Nadu, and Kerala.

According to ISFR-2023, the top ten species by the number of trees under agroforestry in 2023 are: Mangifera indica (mango), Azadirachta indica (neem), Prosopis juliflora (mesquite), Areca catechu (areca palm), Eucalyptus species, Tectona grandis (teak), Cocos nucifera (coconut), Butea monosperma (dhak), Acacia nilotica (kikar), and Ziziphus mauritiana (ber). A significant change in the top ten species is the rise of mesquite to third place, which did not appear in the top 40 species in 2013. Mesquite is primarily found along agricultural bunds and contributes 5.9% of the total estimated number of trees across India (FSI, 2023). Although not intentionally planted by farmers, it has spread naturally across salt-affected, waterlogged and unproductive farmlands. Additionally, ber has improved its ranking and entered the top ten species in 2023. On the other hand, Borassus flabelliformis (palmyra palm) which was in the top ten species in 2013, has fallen out of the top ranks in 2023.

The increased planting of eucalyptus and teak species shows their growing importance as source of industrial wood in India. Meanwhile, neem, dhak, and kikar continue to be traditional multipurpose species widely grown in rural landscapes. Four fruit bearing species—mango, areca palm, coconut, and ber are being preferred widely due to their higher profitability as compared to other alternatives and have been extensively promoted under India's Horticultural Mission. These species also contribute to wood production when they become unproductive as they age.

Volume of Trees

According to Table-1, the total volume of growing stock under agroforestry in India in 2023 is estimated at 129 crore m^3, which is 66% of the volume of TOF across India. This includes trees with diameter at breast height (dbh) of 5 to 10 cm and bamboos which contribute only about 2.4% to the overall growing stock. The highest total volume of trees is found in the southern region with 30.9 crore m^3 of growing stock, while the lowest is in the north-eastern region with 9.4 crore m^3 of growing stock. As per annexure-I, Maharashtra has the highest volume of growing stock in agroforestry, followed by Karnataka, Odisha, Rajasthan, Chhattisgarh, Madhya Pradesh, and Uttar Pradesh. According to the ISFR-2023, between 2013 and 2023, the volume of growing stock in agroforestry increased by 29 crore m^3, reflecting a 29% rise. A significant

increase in the volume of growing stock under agroforestry has occurred in these states in the past decade.

The average volume of trees under agroforestry varies by region. In northern, southern, western, and north-eastern regions, tree sizes are smaller than the national average (0.16 m^3) due to shorter harvesting periods and prevalence of commercial tree crops and bamboo clumps. In contrast, central and eastern regions have larger tree sizes, attributed to naturally occurring or planted multipurpose trees. Tree sizes range from 0.08 m^3 in Kerala to 0.50 m^3 in Chandigarh. Regional variations are influenced by factors like agriculture intensity, size of agricultural landholding, commercial tree crops, bamboo clumps, and climate conditions.

Wood Production

As per ISFR-2023, the potential production of industrial wood from TOF has been estimated as 915 lakh m3 per year which is an increase of about 225 lakh m3 (30%) over the estimates of industrial wood reported in ISFR-2017 and meets about 85% demand of the industrial wood of India. The area under agroforestry is about 42% of the total area under TOF with 77% of tree growth across India. Hence, the contribution of agroforestry in wood production from TOF is more as compared to other areas due to shorter harvesting periods of commercial tree crops and bamboo clumps.

Recommendations

The recommendations for enhancing agroforestry are as follows:

1. The planting stock of tree species commonly used in commercial forestry such as Eucalyptus species, Populus species (poplar), Casuarina species (casuarina), Leucaena leucocephala (subabul), Melia dubia (Malabar neem), teak, Acacia auriculiformis, Ailanthus excelsa (ailanthus), Dalbergia sissoo (shisham), Gmelina arborea, Grevillea robusta (silver oak), and Melia azedarach (Bakain) should be continuously improved. This includes developing new varieties/clones to enhance their productivity, disease resistance and drought tolerance. Increasing the production of commercial wood will help in meeting the raw material demands of wood-based industries and reduce the import of wood and wood products.
2. The planting stock of multipurpose tree species such as neem, dhak, kikar, Acacia leucophloea (ronj), Grewia oppositifolia (bhimal), Holoptelea integrifolia (desi papri), Madhuca latifolia (mahua), Pongamia pinnata (badam papri), Prosopis cineraria (jand), Syzygium cumini (jamun), Tamarindus indica (imli) and Terminalia arjuna (arjun) should also be improved to increase the productivity of non-timber products and boost their commercial utilization. This would help in improving the livelihoods of rural communities and contribute to economic development.
3. The rapid spread of mesquite which ranks third in 2023, is highly detrimental and should be eradicated from unsuitable locations. Although it serves as free fuelwood and is well-suited for saline and alkali soils, it needs to be carefully managed and promoted for its use in problematic sites.
4. The agroforestry primarily focuses on three types of tree crops: commercial tree crops (both forestry and horticultural), naturally or planted multipurpose trees, and bamboo clumps. For future agroforestry statistics, it is suggested that data of bamboo clumps may be reported separately.
5. Similarly, the data on naturally or planted multipurpose and commercial tree crops should also be presented separately to understand their individual impacts. This breakdown of data will enhance planning and decision-making processes which are vital for the sustainable development of the agroforestry sector and the overall development of rural areas.

The development of the agroforestry sector is crucial for meeting the growing domestic demand for timber, non-timber forest products, and industrial needs. Promoting agroforestry will enhance farmers' incomes, provide employment opportunities, mitigate climate change effects, recharge groundwater and reduce the pressure on natural forests. Additionally, it will help save valuable foreign exchange and increase the tax revenue for both central and state governments. The growth of the agroforestry sector will also help in conservation of the environment.

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* 1 crore = 10 million; ** 1 lakh = 100,000

Reference

FSI, 2023. India State of Forest Report-2023, Forest Survey of India, Dehradun.

Annexure-I. State/UTs wise Number of trees (crore) and Volume (crore m^3) of Trees Under Agroforestry.							
Region	**State**	**Geographical Area (lakh ha)**	**Agroforestry Area (lakh ha)**	**Agroforestry Area (%)**	**Total no of trees (crore)**	**Total Volume (crore m^3)**	**Volume/ tree (m^3)**
Central	Chhattisgarh	135	5.6	4.1	27	8.2	0.30
Central	Madhya Pradesh	308	7.7	2.5	38	8.2	0.22
Sub total		**443**	**13.3**	**3.0**	**65**	**16.4**	**0.25**
East	Bihar	94	4.7	5.0	15	4.1	0.27
East	Jharkhand	80	4.2	5.3	20	6.6	0.33
East	Odisha	156	5.6	3.6	26	8.9	0.34
East	Sikkim	7	0.1	1.4	1	0.1	0.10
East	Tripura	10	0.7	7.0	4	0.6	0.15
East	West Bengal	89	4.8	5.4	23	4.1	0.18
Sub total		**436**	**20.1**	**4.6**	**89**	**24.4**	**0.27**
North	Delhi	1	0.02	2.0	0.08	0.01	0.13
North	Haryana	44	1.4	3.2	7	1.3	0.19
North	Himachal Pradesh	56	2.7	4.8	20	1.9	0.10
North	Punjab	51	1.7	3.3	9	1.7	0.19
North	Rajasthan	342	10.6	3.1	54	8.6	0.16
North	Uttar Pradesh	241	9.0	3.7	55	8.0	0.15
North	Uttarakhand	54	2.1	3.9	19	1.7	0.09
North	Chandigarh	0.1	0.0	2.0	0.002	0.001	0.50
North	J&K	222	3.4	1.5	11	3.0	0.27
Sub total		**1011**	**30.9**	**3.1**	**175**	**26.2**	**0.15**
North-east	Arunachal Pradesh	84	3.1	3.7	18	2.1	0.12
North-east	Assam	79	4.3	5.4	18	3.1	0.17
North-east	Manipur	22	0.6	2.7	4	0.5	0.13
North-east	Meghalaya	22	2.4	10.5	19	1.8	0.09
North-east	Mizoram	21	0.7	3.3	5	0.6	0.12
North-east	Nagaland	17	1.3	7.6	11	1.2	0.11
North-east	A&N islands	8	0.1	0.9	1	0.1	0.10
Sub total		**253**	**12.5**	**4.9**	**76**	**9.4**	**0.12**
South	Andhra Pradesh	163	6.0	3.7	42	6.9	0.16
South	Karnataka	192	7.9	4.1	90	9.8	0.11
South	Kerala	38	5.2	13.7	49	3.9	0.08
South	Tamil Nadu	130	5.4	4.2	52	6.1	0.12
South	Telangana	112	3.9	3.5	30	4.2	0.14
South	Puducherry	1	0.02	2.0	0.2	0.02	0.10
Sub total		**636**	**28.4**	**4.5**	**263**	**30.9**	**0.12**
West	Goa	4	0.4	10.0	3	0.2	0.07
West	Gujarat	196	7.5	3.8	42	7.9	0.19
West	Maharashtra	307	14.5	4.7	116	13.7	0.12
West	Dadra & NH, Daman & Diu	1	0.04	4.0	0.2	0.05	0.25
West	Lakshadweep	0.03	0.01	16.7	0.02	0.004	0.20
Sub total		**508**	**22.4**	**4.4**	**161**	**21.9**	**0.14**
Grand Total		**3,287**	**127.6**	**3.9**	**829**	**129.2**	**0.16**

Concerns of Wood based Industries on "The Model Rules for Felling Trees in Agriculture Land"

R.C. Dhiman
Sustainable Agroforestry Initiatives
Greenlam Industries Ltd., 2nd Floor, West Wing,
Worldmark 1, Aerocity, New Delhi.

Trees have been occurring on agriculture land since ages. Many naturally reproduced old trees have been unwillingly retained on agriculture land because of their large sizes posed difficulties in disposal; their close association with spiritual and religious sentiments and transit regulations applicable in many states make their harvesting difficult. Selling of such trees by farmers from their agriculture and private land for commercial value were worked under 10 years felling cycles initially by the state forest departments and subsequently by the state forest corporations. The sale proceed from these trees was handed over to the landowners after deducting service charges on harvesting and marketing. As such there was not much issue in harvesting and marketing of their wood as it was done by the state agencies. With mechanization of agriculture, the number of such trees is on gradual decline over the years. There were approximately 0.6 billion such large sized trees (>96 m^2 crown size) in India during 2014.

Planting a tree or a couple of them around water bodies like tube wells, irrigation channels etc. of the agriculture fields was a normal practice for the purpose of getting shade to take shelter during hot weather. The wood available from such trees was very small and largely used for domestic and agriculture activities and as such they did not have a serious issue of regulations on felling and transit. The planting of farmer's friendly forest trees on agriculture land started picking up during 1970's under social and farm forestry projects which was well spread across the country. Felling and transit regulations on trees grown in agriculture land have been repeatedly discussed right from the initiation of these projects and continued till date. Himachal Pradesh was the first state in the country which exempted five tree species grown on agriculture lands under its 3-Dimensuonal Farm Forestry Project implemented during late 1970's. Other states gradually started exempting more such trees and the process is continuing till date.

Growing forest trees on commercial lines was initiated during mid 1970's by initially promoting Poplar for matchwood production and latter on adding Eucalyptus, Casuarina, Leucaena, Acacias and some others to the list for wood production to other wood based industry (WBI). The activity of planting trees on farmland expanded in those locations and states where there were no regulations on felling and transit on such trees or where their growing was lucrative enough to wear the additional costs on procuring felling and transit permissions. This synergy among the farmers, WBI and market forces proved so useful that the wood production has expanded and virtually shifted from forests to agriculture land so much so that currently around 92% (>90 Mm3) wood is sourced from such trees in the country. There is no other parallel example anywhere in the world where such a huge wood volume is being produced by small farmers in their agriculture land. Policy and planning authorities have regularly suggested promotion of planting trees in agriculture land by deregulating the exiting restrictions including felling and transit regulations from time to time.

MOEF&CC, recently in June 2025, issued advisory framework on Model Rules for Felling Trees in Agriculture Land to the states for issuing state specific notifications on these rules. It is claimed that these rules will ease out growing trees on agriculture land and will further expand agroforestry and wood production. Many farmers, WBI, professionals and others reacted vociferously on these regulations and are questioning the objective, timing and process for enforcing stringent regulations on felling trees grown in agriculture land. Majority of them feel that these regulations will work against the spirit of existing ecosystem favoring agroforestry. Having closely worked with farmers and WBI for a few decades, the author has tried to highlight issues from the perspective of both of them including the intentions of the government to push up TOF certification scheme and carbon trade (carbon credits).

Main ingredients of the guideline circular

The preface of the Rules (Section 1 and 2) mentions that these are issued to unlock the full potential of the agroforestry sector and to establish a regulatory mechanism framework that provides predictability and ease of doing business for farmers, entrepreneurs and investors. Centre after two rounds of consultations with states on the model rules for felling trees in agriculture land on 24th April and 19th May 2025, developed this framework and circulated it to the states/UTs with a request to examine it for adoption and notification. A key barrier reportedly identified by stakeholders is the lack of clear and harmonized rules for felling of trees grown on agriculture land which hampers both cultivation and marketing of agroforestry produce. The objective of these rules is stated to enhance the use of doing business in agroforestry and incentivize farmers to integrate trees into their farming systems without facing undue procedural hurdles. It is therefore considered necessary to provide a streamlined regulatory framework for the promotion, maintenance, felling of trees and certification of timber from non-forest lands; thereby encouraging landowners, farmers, and stakeholders to adopt agroforestry practices while ensuring sustainable resource management.

State level Committee (SLC) constituted under the Wood Based Industries (Establishment and Regulations) Guidelines 2016 has been authorized to act as the state level committee for the purpose of these rules as per its Section 3. The committee may get additional nomination from Revenue and Agriculture departments for this purpose. SLC will play an advisory role to the state for promotion of agroforestry, enhancing timber production from agroforestry, prescribe process and necessary qualification/experience for empanelment of Verifying Agencies, empanelment of Verifying Agencies for the verification of applications for felling and transit of timber from agriculture land; promote production of QPM in the state, facilitate use of technology for providing traceability of timber and its value-added products produced from agriculture land; and integrate the felling and transit modalities into the proposed National Timber management System (NTMS) for ease of doing business.

Applicants (mainly farmers) need to register their plantation areas in NTMS portal by filling documents related to land ownerships and locations (Section 5). Applicants are also required to provide and upload initial plantation details i. e, species-wise number of plants planted, month and year of planting and the average height of seedlings; applicant will upload details of the plantations periodically as suggested by SLC. Tree circumference to be measured at 1.37 m above ground level, geo-tagged photo of each tree is to be uploaded to ensure tractability and compliance. Plantation information is to be monitored by field functionaries of Forest Department, Panchayat Raj and Agriculture Department (Section 6). SLC will empanel Verifying Agencies to engage Auditors with relevant qualification and experience (Section 7).

The procedure for the issuance of felling permit is detailed under Section 8 which prescribes that the applicant will file online application in NTMS with the details of the trees to be felled from the registered plantations; trees will be verified by the Verifying Agency which will submit its report on land trees and estimated volume of harvestable timber. Further applicant seeking felling shall upload photos of 10 trees on the NTMS portal which shall have the capacity to calculate and compute the girth and height of trees, potential yield, and identification of species to facilitate the data entry process in the application form. Applicant will also convey the date of felling the trees, upload photos of the stumps of felled trees on the NTMS. Authorized department may send an officer to physically verify the felling.

On filing the verification report by Verifying Agency, a felling permit will be generated in a prescribed format for the plantations. An NOC shall be issued automatically through the portal for agriculture land with less than 10 trees. DFO has been authorized (under Section 10) to monitor the functioning of the Verifying Agencies by periodic supervision and monitoring, and will also submit their quarterly report to the SLC.

Concerns of Wood Based Industries

Many agencies have been repeatedly advocating the deregulation of felling and transit regulations on trees grown in agriculture land to create a congenial ecosystem for their expansion. This sudden change from deregulation to forced regulations on tree felling in agriculture land is contrary to the existing understanding till date.

These rules are advisory in nature from central government, they are going to become more complicated and stricter in their applications in the states. It is mentioned under Section 1.4 that these rules will suppress all the provisions of existing rules applicable in the state/UT to the extent in conflict with this rule. It is inferred that tree felling regulations will become stricter and time consuming for the plantations those will be registered with NTMS portal and more complicated for those plantations not registered with NTMS. In fact, the rules are silent for granting felling permissions for plantations not registered with the NTMS and this is likely to have much bigger and negative impact on the existing tree culture in agriculture land. It is feared that state agencies may starts considering that since no provision exists for felling of unregistered plantations in the rules as such they can only be harvested

after following the protocol given in these rules.

Rules do not mention anything about those farmers who do not want to register their plantations in NTMS under the given provisions. Many farmers may still wish to continue growing trees without following these rules for accruing tree based benefits from such trees. It is feared that a very large percentage of farmers may exit from growing trees if some space is not provisioned in these rules.

Asking farmers to remain engaged with the proposed National Management Timber System (NMTS) under these rules from the day of making plantations to recording and updating their periodic status on growth and size till the trees are harvested appears unrealistic. The suggested protocol of plantation documentation is a specialized and technical work which could be better handled by the trained and skilled persons. Farmers are likely to face a lot of issues in this process as most of the agriculture operations including tree culture are now being handled by elderly persons who will avoid themselves to get involved with such digital platforms on regular basis whereas educated young generation is gradually desisting from agriculture activities. Even if payoffs from the sale of wood from certified plantations become lucrative, many farmers will have to engage qualified and technically sound persons for doing these outsourced jobs to them. In that case, costs incurred on hiring such persons will further marginalize the returns to farmers. Repeated visits of government functionaries including Auditors, Verification Agencies and others during the period of growing such plantations may not be taken kindly by farmers.

The empanelment of required Verification Agencies mentioned above has been left to the DFOs who will be handling and supervising them at state level. Verification and auditing in this programme is going to very gigantic task. For example, during 2024-25 around 50 Crore clonal Eucalyptus plants were planted across the country and 3.75 Crore Poplar saplings in just north India. In case 100% of planted trees are to be captured in NTMS that will require a huge team of Verification Agencies and Auditors note merely in numbers but with adequate qualification and experience as per the existing norms laid down norms. Any additional over head cost incurred on these agencies will ultimately get transferred on wood value receipts by the farmers.

These model rules issued by the MoEF&CC were developed after a very limited consultation with the states. The two key stakeholders in the success of current agroforestry ecosystems are farmers and WBI and they will be impacted the most from the proposed rules. If any one of them exits the partnership, the agroforestry will collapse. Each state will have its own dynamics and the task will become difficult for most of them to holistically address the major concerns of the stakeholders. It would be better for the central ministry to evolve a general consensus at least on major sensitive issues at national level after having wider consultation with Farmers, WBI and institutes engaged on various dimensions of promotion and research of growing trees in agriculture land and then circulate amended rules to states for incorporating minor state specific ingredients. It is feared that many states will go ahead with the existing notifications on the format without much efforts which may prove counterproductive.

Rules and guidelines are subordinates to specific acts. It is hoped that the proposed rules will also have connectivity with specific acts. The past rules on felling and transit are viewed differently in some states where some exempted trees are continued to be treated at par with the old restrictive regulations on one or other context. For example, in some states the trees grown within a certain distance from government forests are not exempted from felling and transit regulations. If such regulations are governed by central rules (concurrent list) then implementation of state specific rules in such cases would be difficult. The term tree is loosely defined in these rules as "Tree includes palms, stumps, brush-wood and canes".

These rules are framed till the stage the trees are felled without connecting them with the transit of harvested wood. The country has already rolled out One Nation-One Pass under National Transit Pass System (NTPS) a couple of years back. It would be better to connect the harvested wood transport with NTPS for avoiding another process of getting transit passes for wood from registered plantations under these rules.

The documentation part to be carried out by farmers under these rules needs serious reconsideration after wide consultations to make it more practical and low cost to growers and to keep farmers engaged in growing trees for wood production. Farmers have multiple options to shift from trees to other alternate crops; the WBI has little option of getting wood supply sourcing from imports. The import bill of wood and wood related products was around Rs 77000 Crore during 2022-23 accounted for 6% of the total wood demand. If the current wood production system from agriculture land collapses due to uncertainties, the biggest impact would be on the WBI and the country's import bill. It is suggested that these rules with suitable modifications may initially be tested as case studies for a selected trees and in a couple of locations on the pattern of NTPS which was tested initially in two states and was later rolled out at national level.❑

Environment Compliance for Plywood and Panel Industries with Resin & Without Resin

Vasudha Singh, Advocate,
Supreme Court of India

Introduction

The plywood and panel sector forms a crucial part of India's manufacturing economy, serving construction, housing, and furniture industries. This article examines the legal and regulatory framework that governs the sector, distinguishes between resin-based and non-resin-based operations, and analyses the recent judgment by National Green Tribunal, Principal Bench, New Delhi (hereinafter referred to as "NGT") dated 27 May, 2025 in Original Applicant Nos. 849-876/2024 [Sumit Saini v Wishwanath Plywood Industries], with reference to the judgment by Supreme Court of India dated 16 May, 2025 in Writ Petition (C) No. 1394/2023, Vanashakti v Union of India.

Environmental Pollution from Plywood Industries

Air pollution by plywood industries includes formaldehyde and Volatile Organic Compounds from glue application and curing in resin-based units, Particulate Matter from cutting, trimming, sanding, and combustion, as well as Carbon monoxide, Sulfur dioxide, and Nitrogen oxides from boilers burning wood waste. Water and soil pollution can be caused by leaching of resins, tannins, and chemicals from soaking timber and improper waste storage, and pollution of ground water due to discharge of untreated effluents. Solid waste includes sawdust, glue sludge etc., which may be hazardous.

Regulatory Framework Governing Environmental Compliance

The Environment (Protection) Act, 1986 (hereinafter referred to as "EPA") empowers the Central Government to take all necessary measures to protect and improve environmental quality. Under this Act, the Environment Impact Assessment (hereinafter referred to as "EIA") Notification, 2006 requires prior Environmental Clearance (hereinafter referred to as "EC") for industries listed in its Schedule. While plywood manufacturing is not listed, "Synthetic organic chemicals industry (dyes and dye intermediaries; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates)" require prior EC. Thus, the ambiguity arises when plywood industries meet their daily resin needs by manufacturing the resin on their premises.

All plywood units, resin-based or otherwise, must obtain Consent to Establish (hereinafter referred to as "CTE") and Consent to Operate (hereinafter referred to as "CTO") under the Air (Prevention and Control of Pollution) Act, 1981 and the Water (Prevention and Control of Pollution) Act, 1974. In 2016, the Central Pollution Control Board (hereinafter referred to as "CPCB") categorizes the plywood industries (without resin plants) as an Orange Category industry with a Pollution Index of 78.3, reflecting moderate to high pollution potential. Industries are evaluated based on their air emissions, water discharges, and hazardous waste generation.

However, there exists a lacuna in the regulatory framework regarding plywood industries. Unlike the brick kiln or stone crushing industries, plywood manufacturing does not have sector-specific guidelines. There is no uniform criteria for locating plywood industries, safety standards for formaldehyde handling, air pollution control device (APCD) requirements, chemical safety protocols for workers, or differentiation between the compliances required by plywood units with and without in-house resin production.

Conflict between the judgments in Vanshakti and Sumit Saini

In its decision in Sumit Saini, the NGT took cognizance of allegations that a cluster of plywood factories in

Yamuna Nagar, Haryana were operating in violation of environmental norms. It constituted a Joint Committee of State Environment Impact Assessment Authority, Haryana State Pollution Control Board, and the District Magistrate to conduct site inspections. The Committee found various non-compliances, including the absence of scrubbers, bag filters, and proper Effluent Treatment Plants in many resin-based units. It also observed groundwater contamination and improper fly ash disposal. While it was noted that the CTOs granted by the State Pollution Control Board explicitly included permission for plywood industries both with and without resin plants, the NGT held that a captive resin plant in a plywood industry would fall under the requirement of EC under the EIA Notification.

The NGT directed that all Respondent industries that had resin plants and manufactured formaldehyde chemicals will have their CTO revoked and remain closed until EC is obtained under the EIA notification. It issued a slew of other directions to the State Pollution Control Board, such as preparation and implemention a Standard Operating Procedure for proper disposal of wood ash and verify existing disposal practices, particularly dumping in low-lying areas, detailed verification of air pollution control mechanisms installed and their efficacy, formulation and inclusion of condition to raise plantation/green belt in CTOs, water sample analysis for domestic and industrial effluent in neighbouring areas. The Respondent industries were directed to maintain proper records of generation and disposal of wood ash and ensure proper disposal, as well as install flowmeters on borewells and maintain records of consumption of ground water. The NGT finally directed the Ministry of Environment, Forest and Climate Change to frame detailed environmental guidelines specific to the plywood industry.

While the judgment is a welcome step in clarifying the regulatory scenario for plywood industries in Haryana, it also exposes critical ambiguities, particularly for medium-sized industries like plywood manufacturing. Many units that use resins have been uncertain whether they fall within the ambit of activities requiring EC, especially when resin production is in-house but not the primary industrial activity. Historically, resin-based units have

usually operated without prior ECs, and continue to do so in other states. In such a scenario, the order of closure of fifteen of the Respondent industries till ECs are granted has unintended catastrophic consequences. In Vanashakti, a judgment delivered by the Supreme Court of India a week before the NGT pronounced its order in Sumit Saini, the Court categorically ruled against the routine grant of ex post facto environmental clearances, terming them antithetical to the environmental rule of law. The Court emphasized that environmental compliance must be anticipatory and not curative, reinforcing the principle that procedural safeguards under the EPA and the EIA Notification, 2006 cannot be circumvented through post-facto regularization.

Legal Paradox & the Way Forward

This raises a serious legal conundrum. While the NGT has directed plywood industries to remain closed until they obtain Environmental Clearance, the Supreme Court in Vanashakti has unequivocally held that such ex post facto clearances are not legally valid. The contradiction leaves the respondent industries trapped. They are compelled to obtain a clearance that is no longer legally permissible and are barred from operating until they do so. The direction of the NGT is, hence, effectively a death sentence for the industries in view of the decision in Vanashakti. Industries cannot be punished in such a disproportionate manner for gaps in policy. Closure of ongoing units, especially in MSME sectors like plywood, must be avoided where industries have acted in good faith. What is needed now is a harmonized policy, which could be time-bound to ensure compliance.

Before the judgment in Vanashakti was pronounced by the Supreme Court, the prevailing judicial position permitted the grant of ex post facto environmental clearances in exceptional cases. In Civil Appeal No. 4795/2021, M/s Pahwa Plastics Pvt. Ltd. v. Dastak NGO dated 25 March, 2022, the Supreme Court dealt with formaldehyde manufacturing units that had obtained Consent to Establish and Consent to Operate from the State Pollution Control Board, but had not secured prior Environmental Clearance. The Court noted that the units had been set up in good faith and, importantly, that the Pollution Control Board itself had believed that no EC was necessary. In these circumstances, the Court held that such units should not be shut down merely for lacking a prior EC, especially when they could be run sustainably without causing environmental damage. The Court made it clear that the appellants would be allowed to continue operating their units while their applications for EC were being processed.

Conclusion

In the case of the Respondent plywood units in in Sumit Saini, the NGT, did not take note of the Supreme Court's judgment in Vanashakti, delivered a week earlier. In this scenario, the legal regime spelled out in Pahwa Plastics should prevail, allowing the industries to operate till EC is processed. These plywood industries were operating under a clear legal framework, i.e., the Air (Prevention and Control of Pollution) Act, 1981 and the Water (Prevention and Control of Pollution) Act, 1974, which governed their consent to establish and operate. The real policy question is how to facilitate their transition into compliance under the EPA and the EIA Notification especially when resin production is not the primary activity.

Additionally, the EIA Notification, 2006 should be amended to explicitly categorize plywood industries under Category B2. This is crucial because Category 'B1' projects require scoping, public consultation, and appraisal, which are not proportionate or practical for small and medium plywood units. In contrast, Category 'B2' projects are appraised directly based on the proponent's application and Environmental Management Plan (EMP), without the need for public hearings. Given the moderate environmental impact and the MSME character of most plywood units, Category B2 classification would ensure regulatory compliance without overburdening the industries. On 11 April 2019, the Ministry of Environment, Forest and Climate Change wrote to the Indian Plywood Industries Research & Training Institute (IPIRTI), then a Government of India research institute on plywood, stating that "B2" categorisation should be given to "production of resin not exceeding 1000 tons per annum (4 tons per day) by captive manufacturing and utilization in plywood".

A just and time-bound transition mechanism must be developed that promotes environmentally sustainable industrial growth in the plywood sector. It is imperative that the government develops an industry-specific regulatory framework. This should include distinct standards for units having captive resin plants, uniform criteria for siting plywood industries, along with defined standards for emissions, effluent discharges, and waste management. Additionally, the EIA Notification, 2006 should be amended to explicitly categorize in-house resin manufacturing in plywood units, thereby eliminating the prevailing uncertainty. Finally, in order to facilitate a fair transition towards compliance, especially by MSMEs, technological upgrades and the adoption of cleaner, safer production methods should be incentivised.❑

Raw Material Sustainability Tour, Vietnam

Dates: 16th–19th April 2025

Organized by: Federation of Indian Plywood & Panel Industry (FIPPI)

Participants:

1. Dr. M.P. Singh from FIPPI
2. Shri Jinendra Kumar Jain from Greenply
3. Shri Madhu Rao from Action TESA
4. Shri Avinash Kumar Jha from Greenpanel
5. Shri Kondareddy Sunkireddy from Greenpanel
6. Shri Vinay Kumar Tunuguntla from CenturyPly

Introduction

The Vietnam Sustainability Tour 2025 aimed to study how Vietnam integrates forestry with plywood, MDF, and veneer manufacturing through a traceable and efficient supply chain. The delegation explored how government policies, land use strategies, and industry models have positioned Vietnam as a global leader in sustainable wood production.

With a strong focus on plantation practices, raw material sourcing, and certification standards, the tour offered valuable insights that can guide India's journey toward sustainable forestry and wood manufacturing.

Tour Highlights and Daily Summaries:

Day 1: April 16, 2025 - Appreciating Vietnam's Eco-Conscious Culture

Location: Ha Long Bay & Quang Ninh Museum, Hanoi

Summary:

The team arrived in Hanoi and proceeded to Ha Long Bay, where they explored Vietnam's ecological richness and scenic landscapes. A visit to the Quang Ninh Museum provided an overview of the country's cultural, historical, and environmental heritage. The delegation was particularly impressed by the high standards of cleanliness and the active role of communities in maintaining public hygiene and environmental awareness.

Discussion Points:

- Delegation arrived in Hanoi and travelled to Ha Long Bay.
- Explored natural ecosystems and scenic landscapes of the region.
- Visited Quang Ninh Museum, highlighting Vietnam's:
  - Ecological heritage
  - Cultural traditions
  - Historical significance
- Noted exceptional cleanliness of public spaces.
- Observed strong community involvement in hygiene and environmental upkeep.

Day 2: April 17, 2025 – Visit to Plywood, Core Veneer, Film Face & Laminates Factory

Location: Vinh City

Summary:

The team visited a plywood, veneer, and laminate manufacturing unit in Vinh City, where Acacia was observed as the primary raw material. Discussions focused on plantation cycles, yield patterns, cost structures, and export pricing. The factory showcased highly efficient operations with minimal manpower, well-maintained cleanliness, and an effective veneer grading system. The use of clonal plantations and rain-fed methods highlighted Vietnam's cost-effective and scalable forestry practices.

Discussion Points:

1. **Wood Specifications & Plantation Practices:**

- Acacia is the dominant plantation species due to fast growth, high yield, and adaptability.
- Moisture content in harvested wood varies seasonally from 48% to 55%, which affects processing.
- Harvesting cycle ranges between 5 to 8 years, with 130 MT/Ha yield at 5 years and ~10% annual growth until year 8.
- Cost structure:
  - Market price of wood: $56/MT delivered
  - Includes $12/MT for harvesting + loading and $19/MT for transport
- Standing crop value at the field is ~$25/MT.
- Wood has a density of 650–850 Kg/m^3, suitable for veneer production.
- No silviculture or mechanized maintenance – plantations are rain-fed and manually managed.
- All plantations are 100% clonal, ensuring uniformity and faster maturity.

2. **Consumption & Processing Parameters:**

- Peeling core thickness: Typically 1.7mm and 2.1mm.
- Log classification based on girth:
  - 12″ girth: used for veneer peeling
  - <12″ girth: diverted to MDF or chipping mills
- Grading of core veneer from Acacia:
  - 40% A-grade
  - 40% B-grade
  - 20% C-grade
- Grading of Eucalyptus core:
  - Higher A-grade percentage (60%), but costlier than Acacia.
- Export pricing of core veneer:
  - FOB $190/MT in Central & South Vietnam
  - FOB $155–165/MT in North Vietnam
- Wood-to-board ratio: 1 MT of wood = 1.3 CBM (input), yields ~0.84 CBM of core veneer.

3. Strategic & Policy Observations

- Government provides free land (99 years) to farmers, encouraging long-term plantations.
- Foreign industries receive 49-year land leases for plantation and manufacturing use.
- Major foreign players (e.g., Oojee Forest, Nippon Paper, Sumitomo) have established operations under this policy.
- Vietnam's tropical climate ensures sufficient rainfall, reducing the need for irrigation.
- Low labour requirement compared to Indian conditions – highly efficient workforce allocation.
- Minimum 56 hectares required for FSC certification, promoting scale and sustainability.
- Strong government backing for afforestation, local employment generation, and raw material security.

Day 3: April 18, 2025 – Visit to Plantations, Nursery Stock Point, and MDF Factory

Location: Rural areas & Thanh Thanh Dat MDF Factory

Summary:

The team visited to Acacia and Eucalyptus plantations, a nursery stock point, and the Thanh Thanh Dat MDF Factory. The plantations, largely located on undulated terrain, were grown using tissue culture saplings imported from Langsun, China. The MDF factory, with a production capacity of 600 CBM/day, stood out for its automated packaging line and organized production of standardized SKUs. Manual harvesting practices, seasonal moisture management, and seamless raw material flow from plantation to processing were key observations. Limited technical handholding for farmers was noted as an area for improvement.

Discussion Points:

1. MDF Factory – Thanh Thanh Dat (TTD):

- Factory Name: Thanh Thanh Dat MDF – one of the most modern MDF units visited.
- Production Capacity: 600 CBM per day – high throughput compared to Indian standards.
- Storage Capacity:
  - Dry season: 2–4 weeks
  - Rainy season: up to 2 months
  - Ensures uninterrupted supply for processing.
- Process Similarity: Operational flow is similar to Indian MDF units, indicating alignment with global manufacturing standards.
- Key Differentiator:
  - Mechanized packaging of finished goods, improving export-readiness and reducing human error.
- Yield Efficiency (W to B ratio):
  - 1.8 to 1.9 MT of wood used per 1 CBM of MDF.
- SKU Range:
  - MDF boards from 4mm to 25mm thickness.
  - Popular SKUs: 8mm, 12mm, 15mm, and 17mm—reflecting demand for standardized board sizes.

2. Acacia Saplings & Plantation Practices:

- Species Used: Acacia mangium (dominant) and Eucalyptus (to a lesser extent).
- Plantation Spacing: Standard spacing of 2m x 2m, supporting optimized land use.
- Sapling Source:
  - Imported tissue culture clones from Langsun, China, transported by road.
  - Packaged in polybags, ensuring survival during transit.
- Sapling Cost:
  - Purchase @1500 VND

- Sale @1700 VND – slight margin likely due to local handling or subsidies.

➢ Domestic Production:

- Government universities and research centres are planning mass-scale sapling production to reduce import dependency.

➢ Land Characteristics:

- Large-scale plantations, typically on undulated terrain.

➢ Challenge Identified:

- No technical guidance or extension services provided to farmers by universities or government agencies.
- Reliance on farmer experience can lead to inconsistencies in plantation quality.

3. Harvesting Practices & Site Observations

➢ Method:

- Manual harvesting using power chainsaws – labour-intensive, but effective on undulated land.

➢ Cost:

- $12/MT for harvesting and loading.

➢ Preferred Timing:

- Dry season harvesting is preferred to minimize wood moisture content.

➢ Yield:

- 120–130 MT/Ha at 5 years
- 200 MT/Ha at 6–7 years – shows strong growth potential with age.

➢ Wood Suitability for Peeling:

- 5-year-old Acacia yields 60–70% ply-grade wood.
- Beyond 8 years, wood becomes unsuitable for peeling due to hardness.

➢ Species Comparison:

- Acacia is 15–20% cheaper than Eucalyptus.
- However, Eucalyptus provides better veneer yield, making it a trade-off choice.

➢ Land Ownership:

- 80% of plantations are managed by farmers on forest land.
- 20% by industries – showing a healthy mix of private and industrial involvement.

➢ National Impact:

- Vietnam's forest cover is consistently increasing, supported by proactive plantation policies.

Day 4: April 19, 2025 – Visit to Thanh Thanh Dat Office and Wood Chip Factory

Location: Hai Phong

Summary:

The delegation visited the head office of Thanh Thanh Dat Co. Ltd. (TTD) and interacted with its Chairman, Mr. Tran Quang Luan. He emphasized TTD's intent to obtain BIS certification and resume exports to India. The group also toured TTD's wood chip factory, which operates with three chippers and a capacity of 40 MT/hour, receiving wood directly from forests without storage yards. TTD's ownership of shipping containers and export vessels, along with its network of 44 chip mills across Vietnam, demonstrated Vietnam's vertically integrated, export-ready infrastructure.

Discussion Points:

1. Company Profile – Thanh Thanh Dat Co. Ltd. (TTD)

➢ Chairman Interaction: Met with Mr. Tran Quang Luan, Chairman of TTD, who provided insights into the company's operations and future plans.

➢ Diverse Business Portfolio:

- TTD is a multi-sector enterprise, active in:
  - Wood and panel manufacturing
  - Ocean freight and shipping
  - Building construction
  - Real estate development

➢ Core Manufacturing Activities:

- Involves forest nurseries, collection of forest products, and production of:
  - Veneer
  - Plywood
  - Engineered wood products

➢ Scale of Operations:

- Operates 35 factories across 11 provinces in Vietnam.
- Annual turnover of approximately $300 million USD.

- Ranked as the second largest wood chip exporter to China and Korea.

2. Strategic Interaction with Chairman:

- Mr. Tran Quang Luan expressed keen interest in collaborating with Indian manufacturers in the wood panel industry.
- He emphasized the company's intention to obtain BIS certification to restart exports to India for both MDF and plywood.
- Currently, due to BIS norms, TTD's export operations are partially restricted, leading to reduced plant utilization.
- TTD maintains 4,000 hectares of plantation land, showcasing vertical integration from forest to export.

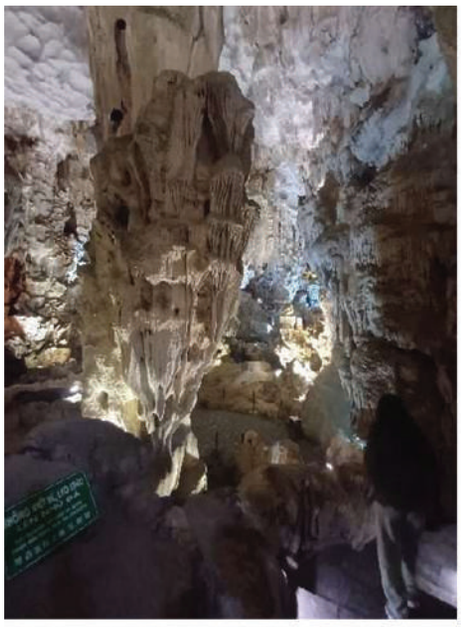
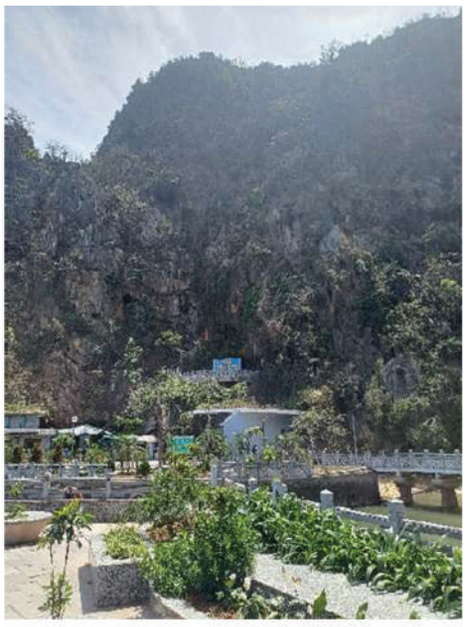
3. Wood Chip Factory – Operational Overview:

- Chipping Capacity:
  - Equipped with 3 chippers having a total throughput of 40 MT/hour.
- Logistics Efficiency:
  - No wood yard storage – wood is transported directly from forests to the chipper, enhancing freshness and reducing overhead.
- Export Infrastructure:
  - TTD operates 44 chip mills across Vietnam.
  - Owns containers and shipping vessels, giving it full control over logistics and export supply chains.
- Wood Source:
  - Chips are produced using debarked Acacia wood, a cost-effective and high-yield species.

Conclusion

Vietnam's wood industry is thriving due to its strong focus on sustainability, proactive FSC certification, and export-oriented practices. Despite challenges like rising costs and regulatory demands, the sector remains resilient and adaptable. With continued innovation and commitment to global standards, Vietnam is well-positioned to retain its leadership in the global wood products market.

Visual Highlights from the Sustainability Tour




ĐẢNG CỘNG SẢN VIỆT NAM QUANG VINH MUÔN NĂM !
ĐẢNG BỘ CÔNG TY TNHH THANH THÀNH ĐẠT
CHI BỘ CÔNG TY CỔ PHẦN DỐ MDF THANH THÀNH ĐẠT
ĐẠI HỘI NHIỆM KỲ 2022 - 2025


NHÀ MÁY GỖ PLYWOOD THANH THÀNH ĐẠT


NHÀ MÁY GỖ PLYWOOD THANH THÀNH ĐẠT


MỖI CÔNG NHÂN LÀ 1 KSC

Unlocking India's Agroforestry Carbon Potential: FIPPI Collaborates with ICFRE to Develop a Methodology for Agroforestry – Based Carbon Offset Projects Under the Indian Carbon Trading Scheme

FEDERATION OF INDIAN PLYWOOD & PANEL INDUSTRY

REGISTERED UNDER THE SOCIETIES REGISTRATION ACT XXI OF 1860, REGN. NO. S/2985/1968-69 DT. 4.1.1969

1005, VIKRANT TOWER, 4, RAJENDRA PLACE, NEW DELHI110 008, INDIA
Phone No.: +91-11-2575 5649 • **E-mail:** fippi@fippi.org • **Website:** www.fippi.org

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FIPPI/125-1/2025-26 Dated: April 25, 2025

To
The Director General
Indian Council of Forestry Research & Education
P.O. New Forest,
Dehradun-248006.

Subject: Development of Draft Methodology for Agroforestry Based Carbon Credit Projects under offset mechanism in the Carbon Credit Trading Scheme for Indian Carbon Market – reg.

Dear Madam,

The Energy Conservation (Amendment) Act, 2022 empowered the Central Government to specify the Carbon Credit Trading Scheme. The framework for Indian Carbon Market was developed by notifying the Carbon Credit Trading Scheme (CCTS) vide S.O. 2825(E), dated 28th June 2023 and amendment notification S.O. 5369(E), dated 19th December 2023. Under the CCTS. the Central Government has constituted the National Steering Committee for Indian Carbon Market (NSC-ICM) co-chaired by Secretary Ministry of Environment, Forest and Climate Change and Secretary, Ministry of Power to have direct oversight of the functioning of Indian carbon market.

2. With reference to the sub paragraph (2) (b) of the paragraph (5) of the notification, one of the functions of Bureau as ICM Administrator is "to identify the sectoral scope and develop the methodologies to be used under offset mechanism". Further, with reference to the sub- paragraph (2) of paragraph 11A of the notification, the Bureau on the recommendation of National Steering Committee for Indian carbon market and after approval of the Central Government is empowered to publish sectoral scope and methodologies from time to time. Further, during the 6th meeting of the NSC-ICM, the committee recommended the sectoral scope under the offset mechanism. The list of the sectors as recommended by the NSCICM and approved by the Central Government includes Agroforestry as available technology under offset mechanism of the Agriculture sector.

3. ICFRE is playing a key role in developing the agroforestry models for different agroclimatic zones of the country as well as developing the clones and varieties of the important tree species for productivity enhancement. ICFRE is also playing an important role in promoting sustainable land use and climate mitigation initiatives through nature-based solutions/ approaches. As you are aware, Indian Wood Based Industries are undertaking immense interest in growing Timber Species under Agroforestry for raw material sustainability, and agroforestry holds immense potential in this Carbon Credit Trading domain due to its climate mitigation co-benefits, biodiversity conservation,

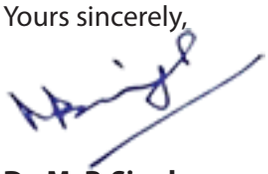
and rural livelihood enhancement. However, a major challenge in unlocking this potential is the lack of a robust, India-specific, and scientifically sound methodology for quantifying and verifying carbon sequestration from agroforestry systems. Such a methodology is essential for the inclusion of agroforestry projects in recognized carbon credit offset mechanisms.

4. In light of ICFRE's extensive expertise in forestry, carbon stock assessment, REDD Plus and forest ecosystem management, Federation of Indian Plywood and Panel Industry (FIPPI) respectfully requests your esteemed organisation to consider developing a standardized methodology specifically tailored to India's diverse agroclimatic zones. This methodology may be designed in alignment with IPCC guidelines and internationally recognized best practices to ensure its robustness and applicability across both compliance and voluntary carbon markets. I am confident that this collaborative initiative will not only enable landowners and farmers to actively engage in carbon markets, but will also make a substantial contribution to India's climate goals under the Paris Agreement and support the national objectives outlined in the National Mission for a Green India.

We would be pleased to extend our support to this effort, particularly in facilitating field-level data collection for development of methodology and piloting the implementation of the proposed methodology. We look forward to the opportunity to discuss this proposal further and explore potential pathways for partnership in developing a robust framework for agroforestry-based carbon credit projects.

Thank you,

Yours sincerely,



Dr. M. P. Singh
Director General,
Federation of Indian Plywood and Panel Industry (FIPPI)
New Delhi

Copt to:
Secretary,
Ministry of Environment, Forest & Climate Change
Indira Paryavaran Bhawan,
Jorbagh Road,
New Delhi-110 003

Project Proposal Submitted by ICFRE to FIPPI: Development of Methodology for Agroforestry – Based Carbon Offset Project for the Indian Domestic Carbon Market

Introduction:

India's forest and tree cover which is about 25.17% of its total geographical area, plays a vital role in ecological and economic development of the country. However, forests are degraded to meet the increasing demand of fuel, fodder, timber and non-timber forest products. Competing uses of land for agricultural, infrastructure developmental projects, human settlement and industries exerts tremendous pressure on the land resources of the country. Rising atmospheric carbon dioxide concentration and climate change will be additional stress on the forests making more vulnerable in the context of climate change. Despite pressures on the forests for development purposes, India is committed to achieve its National Forest Policy's Goal of having 33% of its geographical area under forest and tree cover. Besides, this there are Nationally Determined Contribution (NDC) targets committed by the country under the Paris Agreement, Land Degradation Neutrality target under the United Nations Convention to Combat Desertification, Biodiversity Targets under the Convention on Biological Diversity and Sustainable Development Goals to be achieved by 2030. NDC forestry target of India is to create additional carbon sink of 2.5 - 3 billion tonnes of carbon dioxide equivalent through additional forest and tree cover by 2030.

To reduce pressure on existing forests, to meet increasing demand of forest produces and to achieve national targets and international commitments some transformative actions are required to be taken on forest and non-forest lands. Agroforestry and farm forestry generate significant ecosystem services such as watershed protection, soil conservation, biodiversity conservation, carbon sequestration and avoided emissions, and also minimizes climatic and financial risks. Hence, agroforestry and farm forestry have potential for improving soil health, water conservation, carbon sequestration and biodiversity conservation. National Forest Policy, 1988 intends to reduce the pressure on natural forests for fuelwood, fodder and industrial raw material and lays emphasis on growing trees outside forests. National Agroforestry Policy (2014) also emphasized the environmental contribution of agroforestry through preventing deforestation, promoting carbon storage, conservation of biodiversity and reducing pressure on natural forests. Agroforestry and farm forestry also act as an important source for timber and fuel wood to meet the demands of fast-growing population of the country and can save huge amount of the foreign exchequer. Since the Green Revolution in India, agriculture has undergone significant diversification, with the adoption of various models such as mixed cropping and agroforestry. Trees into agricultural landscapes not only generate income through timber and non-timber products but also strengthens vital ecosystem services. Agroforestry plays a pivotal role in reducing vulnerability, enhancing the resilience of farming systems, and protecting rural livelihoods from climate-related risks.

Agroforestry systems make efficient use of land and serve as a catalyst for the provision of ecosystem services, playing a vital role in rehabilitating degraded and marginal lands (Rohrig et al., 2020). Numerous studies have emphasized the key advantages of agroforestry, such as generating additional income (Foster and Neufeldt, 2014) and providing climate regulation services, particularly carbon sequestration (Millennium Ecosystem Assessment, 2005). Furthermore, agroforestry systems contribute to biodiversity conservation, supply raw materials, prevent soil erosion and nutrient loss, and offer socio-economic benefits (Oteros- Rozas et al., 2018; Crous-Duran et al., 2020). However, the extent to which agroforestry systems can supply ecosystem services largely depends on cropping intensity and land cover changes (Rolo et al., 2021). Agroforestry, is increasingly being recognized as a sustainable land management strategy to mitigate the impacts of global climate change (IPCC, 2019).

In India, agroforestry has long been a traditional resource management and climate change adaptation practice. It involves the deliberate incorporation of trees into existing cropping systems. Historically, such systems have been adopted for their symbiotic benefits among crops, trees, and livestock, as well as for producing food and fibre (Chavan et al., 2015). Most agroforestry systems in India are shaped by indigenous knowledge and are tailored to local conditions and regional climates, resulting in significant variability across different areas (Chavan et al., 2015). Agroforestry systems are practiced across approximately 25.32 million hectares in India, accounting

for about 8.2% of the country's total geographical area (Dhyani et al., 2014). Agroforestry plays a significant role in enhancing rural livelihoods and contributes substantially to the Indian economy. According to Handa et al. (2016), agroforestry has the potential to generate up to 943 million person-days of employment annually across the nation. Recognizing its importance, India adopted the National Agroforestry Policy in 2014 to address critical issues related to research, extension, production, and marketing of agroforestry- based products, while also aligning with its climate change mitigation goals. Despite a number of efforts by the Government of India to promote agroforestry and farm forestry in the country, there are still some issues and challenges for its development and expansion such as complicated procedures for obtaining felling permit and transit pass, non-availability of organized trade of wood, lack of well-developed markets for agroforestry and farm forestry products, predominant buyers' market, absence of locally available wood processing units, non-availability of quality planting material, inadequate network of forest nurseries, pests and diseases management, lack of proper agro-economic model and their proper demonstration, no buy back guarantee from wood-based industries, lack of entrepreneurship among farmers and their tendency of risk-avoidance, lack of investments, inadequate knowledge dissemination, lack of coordination among the line departments of the State Governments etc. Institutional frameworks and domestic market mechanism that facilitate the adoption of agroforestry and farm forestry need to be developed to recognize the contribution of agroforestry and farm forestry in the national development.

ICFRE developed various agroforestry models for seven agro-climatic zones of India (ICFRE, 2020):

1. Trans Himalayan Region" Salix (Salix fragilis and S. alba) and poplar (P. euphratica, P. alba, P. nigra) based agroforestry model and Apple based horti-medicinal model.
2. Western Himalayan Region and Indo-gangetic Plains: Melia (Melia dubia)-Aonla (Emblica officinalis) based model, Poplar (Populus deltoides) based agri-silviculture, Poplar (Populus deltoides) based silviculture-medicinal models, Melia (Melia dubia) based agri- silviculture model, Eucalyptus (Eucalyptus teriticornis) based block model, Poplar (Populus deltoides)-Wheat agroforestry model.
3. Eastern Himalayan Region: King chilli (Capsicum annuum)-Arecanut (Areca catechu) based model, Gmelina (Gmelina arborea) based agri-silvi model
4. Gangetic Plain Region: Poplar (Populus deltoides) - wheat agri-silviculture model, Poplar (Populus deltoides) -maize agri-silviculture model, Poplar (Populus deltoides) -banana silvi-horticultuire model, Poplar (Populus deltoides)-turmeric agri-silviculture model and Poplar (Populus deltoides) –Jimikand agri-silviculture model.
5. Plateaus: Teak (Tectona grandis)-Turmeric (Curcuma domestica) silvimedicinal model, Bamboo (Dendrocalamus species) based silvi-agri model, Flemingia (Flemingia macrophylla and F. semialata) based model, Babul (Acacia nilotica)-Paddy (Oryza sativa) model, Sandalwood-Teak-Eucalyptus-Redsanders based silvi-agri model, Sandalwood (Santalum album) based agroforestry model.
6. Western Dry Region: Hardwickia binata based agroforestry model, Emblica officinalis based agroforestry model, Colophospermum mopane based agroforestry model and Prosopis cineraria-Zizyphus mauritiana agroforestry model.
7. Coastal Plains and Ghats: Casuarina (Casuarina equisetifolia)-Maize (Zea mays) agrisilviculture model, Casuarina (Casuarina equisetifolia)-Moringa (Moringa oleifera)- Maize (Zea mays) agri-silvi-horticulture model, Acacia auriculiformis -Napier grass silvi- pasture model, Tectona grandis-Phaseolus mungo agri-silviculture model, Acacia mangium -Beans (Vigna species) agri-silviculture model, Acacia mangium -Pepper (Piper nigrum) silvi-horticulture model and Casuarina spp. based windbreak agroforestry model.

ICAR brought a publication titled Agroforestry for Income Enhancement, Climate Resilience and Ecosystem Services in 2020 in which 16 agroforestry models (Poplar based Agroforestry Model, Eucalyptus based agroforestry Model, Casuarina based Agroforestry Model, Melia based Agroforestry Model, Teak based Agroforestry Model, Gamhar based Agroforestry Model, Shisham based Agroforestry Model, Mangium based Agroforestry Model, Bamboo based Agroforestry Model, Ardu based Agroforestry Model, Kapok based Agroforestry Model, Mulberry based Agroforestry Model, Calliandra and Mulberry based Agroforestry Model, Leucaena and Gliricidia based Agroforestry Model, Peach based Agroforestry Model and Apricot based Agroforestry Model) have been complied (ICAR, 2020).

Agroforestry and farm forestry are considered as the real game changer in extension of green cover for sustainable land and ecosystem management. Agroforestry and farm forestry provide ample opportunity

for the bio-economy and for support of forest-based industries, hence, play an important role in achieving India's national targets and international commitments related to climate change mitigation and adaptation, biodiversity conservation, combating desertification and land degradation and sustainable development goals; and shifting India towards an innovative, resource efficient and bio-based carbon neutral economy. India's ambitious net-zero target by 2070 and its evolving Indian Domestic Carbon Market present an opportunity to unlock the potential of agroforestry for climate change mitigation. India lacks a formal methodology to include agroforestry in the Carbon Credit Trading Scheme. While global standards like CDM, Verra, and Gold Standard offer frameworks, which are not fully compatible with the Indian agro-ecological and socio-economic context. However, the absence of a dedicated methodology for agroforestry-based carbon offset projects restricts farmers participation in carbon credit trading. This project proposes to fill this gap by developing a robust, science-based, and farmer-inclusive methodology suitable for adoption by farmers thereby enabling them to benefit from Carbon Credit Trading Scheme.

India ratified the Paris Agreement on Climate Change in 2016, committing to limit the global average temperature rise to below 2°C by the end of the century. As part of its first Nationally Determined Contributions (NDCs), India pledged to reduce the greenhouse gas (GHG) emission intensity of its economy by 33-35% by 2030 from 2005 levels. In August 2022, the Government of India updated its NDCs, raising its ambition to a 45% reduction in GHG emission intensity by 2030 from 2005 levels.

India is developing a robust National Framework for its Carbon Market. The Indian Carbon Market Framework has two key mechanism viz. compliance mechanism which aims to address the emissions from its energy use and industrial sectors and offset mechanism to incentivize the voluntary actions from entities for greenhouse gas reduction, thus providing a comprehensive approach to decarbonization of the economy. Government of India has approved 10 sectors in Offset Mechanism under Carbon Credit Trading Scheme. Agroforestry is covered under the sector agriculture.

Country specific methodology for agroforestry for the carbon offset mechanism needs to be developed for tapping the carbon sequestration potential of agroforestry system and enhancing the farmers income through Carbon Credit Trading Scheme. ICFRE in collaboration with Federation of Indian Plywood & Panel Industry is proposes to develop a scientifically rigorous, scalable, and MRV (Monitoring, Reporting, and Verification) compliant methodology tailored for agroforestry-based carbon offset projects as per the guidelines of the Carbon Credit Trading Scheme under the Indian Carbon Market.

Objectives: To develop a comprehensive methodology for agroforestry-based carbon offset project in the Carbon Credit Trading Scheme of the Indian Carbon Market.

Review of Literature:

There is growing interest in the role of various land-use systems in stabilizing atmospheric carbon dioxide levels either by reducing emissions or enhancing carbon sequestration through forestry and agroforestry approaches. The role of forests and trees in the carbon sequestration is well established (Singh and Lal, 2000), and forests are recognized as major carbon sinks (Wang et al., 2001). Consequently, land-use practices such as afforestation, reforestation, natural forest regeneration, silvicultural systems, and agroforestry have garnered significant attention for their potential to enhance terrestrial carbon storage (Brown, 1996; Canadell and Raupach, 2008). Agroforestry systems that are better managed show greater potential for carbon sequestration, both in the soil and in above-ground biomass. Below-ground tree biomass, in the form of roots, accounts for about one-fifth to one-quarter of the total living biomass and contributes to soil carbon through decaying root matter (Dhyani and Tripathi 2000). Furthermore, improved soil aggregation in natural forests, multi-layered agroforestry systems and agri-horti-silvi-pastoral systems through the maintenance of year-round vegetative cover can be attributed to the higher percentage of organic carbon present in the soil.

The Intergovernmental Panel on Climate Change also highlighted in its special report that converting wastelands and grasslands to agroforestry has the greatest potential to absorb atmospheric carbon dioxide in addition to its direct benefits (IPCC, 2007). Since carbon dioxide is the dominant greenhouse gas, accounting for 77% of total anthropogenic greenhouse gas emissions, reducing its concentration in the atmosphere is crucial. Carbon sequestration involves capturing atmospheric carbon dioxide and storing it long-term through both natural (soils and vegetation) and engineered techniques (Schrag, 2007). Among all natural methods, agroforestry offers a unique win-win opportunity for achieving both carbon sequestration and climate change mitigation and adaptation. Numerous studies have provided strong evidence that agroforestry systems can play a significant role in storing carbon in both aboveground biomass (Murthy et al., 2013) and belowground biomass (Nair et al., 2009). Agroforestry systems contribute to carbon sequestration through aboveground biomass (Montagini

and Nair, 2004; Mutuo et al., 2005; Verchot et al., 2007), belowground biomass, and soil carbon pools (Nair et al., 2009). In agroforestry systems, while trees sequester significant amounts of carbon, crops also contribute considerably to carbon fixation and storage, and crops enhance the organic matter content in the soil, which is a vital component of the terrestrial carbon pool (Ciampitti et al., 2011). Increasing the carbon pool in soil can be achieved through the adoption of appropriate crop rotations (Wright and Hons, 2005), integrated soil fertility management (Lal, 2010; Srinivasarao et al., 2012), precise fertilizer use, and organic amendments (Schuman et al., 2002; Mandal et al., 2007; Majumder et al., 2008), as well as the practice of conservation agriculture (Lal, 2009).

It is known fact that an agroforestry system sequesters more carbon into soil and vegetation than a monoculture farming system (Rimhanen et al., 2016). Agroforestry as a carbon sink represents untapped potential to feasibly deliver benefits from carbon schemes to poor smallholders in developing countries. It is important to explore the opportunities and options such as crop diversification, adoption of agroforestry systems. Agroforestry is highly desirable due to its positive impacts on both climate change adaptation and mitigation, as well as its ability to sustain farm income. The integration of trees with crops not only provides timber, fuel, fodder, and food but also helps reduce carbon dioxide levels in the atmosphere to an acceptable extent. The carbon sequestration potential of agroforestry systems is higher than that of any other land use system, except forests. The carbon sequestration potential of trees varies depending on species, structure, age, and spatial distribution. In agroforestry systems commonly practiced by farmers, with tree densities ranging from 312 to 800 trees/ha, the carbon sequestration potential typically ranges from 0.25 to 19.14 Mg C/ha/yr. Nair et al. (2010) reported a global range for carbon storage in agroforestry system from 0.29 to 15.21 Mg C/ha/yr in above-ground biomass, and between 30 and 300 Mg C/ha up to a depth of 1 meter in the soil, with tree ages ranging from 4 to 35 years. This indicates that agroforestry not only improves the livelihoods of small and marginal farmers but also contributes to mitigating global warming by enhancing the carbon sequestration potential of Indian agriculture (Ajit et al., 2013). A survey conducted across 32 districts in 12 states to assess existing agroforestry systems on farmers' fields by Dhyani et al., 2016 revealed that agroforestry is practiced throughout India and holds significant potential for carbon sequestration. The number of trees per hectare on these fields ranged from 2 to 204, with baseline standing biomass in the tree component varying from 0.58 to 113.12 Mg DM/ha. The total biomass, including both tree and crop biomass, ranged from 4.96 to 123.58 Mg DM/ha. The soil organic carbon in the baseline ranged from 4.28 to 24.13 Mg C/ha. The carbon sequestration potential of existing agroforestry systems at the district level was estimated to range from 0.05 to 2.78 Mg C/ha/yr. The average number of trees per hectare was found to be 19.44, with an average carbon sequestration potential of 0.34 Mg C/ha/yr at the national level. This translates to a potential mitigation of 1.245 Mg C/ha/yr from existing agroforestry systems. Consequently, the trees in these systems are estimated to mitigate more than 33% of the total greenhouse gas emissions from the agricultural sector annually at the national level (Dhyani et al., 2016).

A carbon market methodology defines a standard set of parameters, criteria, and operations required for the calculation of emission reductions or removals from a carbon project during its lifetime. Baselines, additionality, and leakage are key concepts in carbon market methodologies. Standardized methodologies are essential to quantifying real and accurate greenhouse gas benefits of a project and to generate carbon credits. The Clean Development Mechanism (CDM) framework under the Kyoto Protocol that allows industrialized countries to invest in emission-reduction projects in developing countries as a way to meet their own emission reduction targets. CDM project in forestry sector is known as Afforestation and Reforestation (A/R) which involves planting trees on land that either was not previously forested or that was deforested. CDM A/R methodologies are structured approaches used to quantify the net anthropogenic greenhouse gas removals by sinks, and to ensure projects comply with CDM rules. Following methodologies for CDM A/R are approved by the UNFCCC CDM Executive Board and include baseline methodologies, monitoring methodologies, and tools:

- **AR-AMS0003:** A/R Small-scale Methodology: Afforestation and reforestation project activities implemented on wetlands
- **AR-AMS0007:** A/R Small-scale Methodology: Afforestation and reforestation project activities implemented on lands other than wetlands
- **AR-ACM0003:** A/R Large-scale Consolidated Methodology: Afforestation and reforestation of lands except wetlands
- **AR-AM0014:** A/R Large-scale Methodology: Afforestation and reforestation of degraded mangrove habitats

Some of the methodologies currently being used in agriculture sector under the voluntary carbon markets are given below:

- The agricultural land management methodology (Verra VM0042)
- Methodology for biochar utilization in soil and non-soil applications (Verra VM0044)
- The Small-Holder Agriculture Mitigation Benefits Assessment (SHAMBA) tool (Plan Vivo)
- Soil organic carbon activity module (Gold Standard)
- Water and erosion impact assessment of sustainable agricultural land management projects (Gold Standard)
- Methane emission reduction by adjusted water management practice in rice cultivation (AMS-III AU)
- Methodology for the reduction of enteric methane emissions from ruminants through the use of feed ingredients (Verra VM0041)
- Methodology for reducing food loss and waste (Verra VM0046)
- Afforestation/Reforestation (A/R) GHG emissions reduction & sequestration methodology (Gold Standard)

India has been an active participant in the Clean Development Mechanism (CDM) under the Kyoto Protocol, particularly through Afforestation and Reforestation (A/R) projects. These initiatives aim to sequester carbon dioxide by expanding forest cover on degraded lands, while also delivering socio-economic and environmental co-benefits. Of the 67 CDM A/R projects registered globally, India accounts for 19 CDM A/R projects, highlighting its significant commitment to sustainable land-use practices and climate change mitigation. Besides this, 37 projects related to Agriculture, Forestry and Other Land Use sector from India are also registered under the voluntary carbon standard as per the following details:

Projects registered under VERRA (Agriculture, Forestry and Other Land Use)

S. No.	Name of the Project	Methodology	Estimated Annual Emission Reductions
1	Strengthening Rural Livelihoods of Smallholder Farmers In Tribal Districts of Odisha	AR-ACM0003	1,59,512
2	Restoration Of Homestead Land Of Poor Rural Communities In Assam & Meghalaya	AR-ACM0003	1,70,282
3	Sustainable Paddy Program	AMS-III.AU	54,252
4	Community Participative Forestry/Agroforestry Development Project in India	AR-AMS0007	10,371
5	Developing Climate Resilience of the Coastal Communities of Sundarbans Through Mangrove Afforestation	AR-AM0014	29,782
6	Participatory Mangrove Afforestation & Restoration in The West Coast of India	AR-AM0014	9,003
7	Core Carbon Sustainable Rice Productions	AMS-III.AU	1,375
8	Core Carbon Sustainable Rice Productions	AMS-III.AU	4,740
9	Grouped Reforestation Project by Cropzone Agro Forestry Pvt. Ltd.	AR-ACM0003	10,673
10	Mahogany Plantation In India	AR-ACM0003	8,446
11	Reforestation of Degraded Land by MTPL In India	AR-ACM0001	1,46,998
12	Plantation Project On Wastelands by Sun Plant Agro Limited	AR-AMS0005	1,708
13	Agricultural Land Management Project In Beed District, India Implemented By Godrej Properties Ltd.	VM0017	33,764
14	TIST Program In India	AR-AMS0001	11,047
15	Community-Based Reforestation Project On Degraded Lands In Uttar Pradesh, India By Indian Farm Forestry Development Co-Operative Ltd.	AR-AMS0005	5,651
16	Reforestation Of Degraded Land In Chhattisgarh, India	AR-ACM0002	5,007
17	Araku Valley Livelihood Project	AR-ACM0003	80,660
18	India Sundarbans Mangrove Restoration	AR-AM0014	51,249

Projects registered under Gold Standard (Agriculture Forestry and Other Land Use)			
S. No.	**Project Name**	**Methodology**	**Estimated Annual Credits**
1	Ayyalur Livelihoods Project	Afforestation/R eforestation GHG Emissions Reduction & Sequestration Methodology	70570
2	Plant For Planet		2250000
3	Plant For Planet		9000000
4	Tasar tree-based Afforestation for livelihood Sustainability And carbon Removal		369346
5	Plantation activities in Nestle India Milk Supply Chain		79620
6	Agroforestry project in India		22933
7	Improving Livelihoods of Farmer Communities through Afforestation in East Uttar Pradesh		663
9	Parry Agro Industries C Cubed Tea and Rubber Agroforestry for Carbon Sequestration Biodiversity Conservation and Improved Social Wellbeing		21000
10	Bamboo Plantation to secure livelihood of the indigenous communities in India		58871
11	Building Climate Resilience through Afforestation Reforestation & Agroforestry		145945
12	Forest Trees and Sustainable Livelihoods		2213
13	Enhancing Climate Community and Biodiversity benefits through restoration of barren uplands of vulnerable communities in Mayurbhanj district of Odisha		66734
14	Forest Trees and Sustainable Livelihoods		20000
15	Climate Action program for community led carbon sequestration		40000
16	Climate Action program for community led carbon sequestration		80000
17	Forest Trees and Sustainable Livelihoods		16000
18	Himalayan Oak Restoration Project		75517
19	Bagepalli CDM Reforestation Programme		92103
One project on REDD+ from Indi also registered under PLAN VIVO.			

Methodology:

Indian Carbon Market Methodology Development and Adoption Procedure will be followed for development of the methodology for agroforestry under the sectoral scope agriculture. Following key principles given in the Methodology Development and Adoption Procedure will be followed for development of the methodology:

Guiding Principles: The methodology development and its review shall follow principles based on the International Organization for Standardization (ISO) 14064 Part 2 (2019) specifications to ensure that methodology application facilitates compliance with GHG accounting principles. The application of following principles is fundamental to design and implementation of project under the Offset Mechanism and shall be consistently applied by the non-obligated entities and other relevant stakeholders.

Methodology Principles: The methodology and methodology tools shall adhere to the below mentioned principles and shall also follow the latest guidelines and requirements of the Development and assessment of Article 6.4 mechanism methodologies standard under Article 6.4 (Paris Agreement)

- The methodologies should enable the implementation of technologies or measures that are not commonly used or accessible in certain areas, to promote knowledge sharing and encourage the adoption of technologies or measures that lower costs and attract investment in low-carbon solutions.

- These methodologies should include provisions that support the gradual integration of more efficient and less greenhouse gas (GHG)-emitting technologies, as well as scalable and replicable mitigation activities. This approach should aim to expand the user base, increase geographic reach, and enhance the adoption of low-carbon solutions following their initial deployment.
- The methodologies must include reliable methods for estimating emission reductions or removals to ensure that the outcomes of project activity accurately reflect real reductions or removals of GHG emissions in tonnes. Such estimations shall be based on up to-date scientific information and reliable data. Furthermore, the methodologies must include provisions ensuring a robust system for monitoring, data collection, and reporting to maintain credibility. When secondary data is employed, the methodologies should require non-obligated entity to justify that the data source is suitable and that the data used is conservative.
- The methodologies must include provisions that ensure the baseline chosen for an emission reduction activity is demonstrated to be below the 'business-as-usual' (BAU) level. BAU emissions serve as plausible reference points or scenarios for GHG emissions prior to or without the implementation of the activity. To achieve this, these methodologies should require the identification of the BAU scenario or reference benchmark emissions and outline a method for estimating them.
- The methodologies must include or reference provisions that mandate the accounting of uncertainties related to emission factors, activity data, and other estimation parameters used in calculating emission reductions or removals, in accordance with relevant IPCC guidelines.
- The methodologies must include provisions that consider relevant national, regional, or local social, economic, environmental, and technological circumstances, using robust and verifiable data. These methodologies should specify the type of data and information needed to meet these provisions, particularly concerning eligibility conditions, baseline setting, and demonstrating additionality.

Following steps will be followed for development of the methodology:

Step 1: Methodology Concept Note Submission
Methodology developer submits the methodology concept note and ICM Administrator reviews the concept note and provides decision on concept note submission.

↓

Step 2: Draft Methodology Preparation
On approval of the concept note, Methodology developer submits the draft of the methodology and ICM Administrator assesses the eligibility in line with the "Methodology Development and Adoption Procedure."

↓

Step 3: Methodology Review by Technical Committee for Offset Mechanism
ICM Administrator conducts a completeness check submits to the Technical Committee for review. The ICM Administrator responds to the review comments by committee and obtains approval from the committee for publishing it on ICM web portal for public comments.

↓

Step 4: Draft Methodology for Public Comments
ICM Administrator publishes the draft methodology on the ICM web portal for public comments for 30 calendar days.

↓

Step 5: Publication of methodology on ICM Web-Portal
The public comments are addressed by the methodology developer through changes/revisions in consultation with the ICM Administrator. The Technical Committee reviews the revised methodology and prepares its recommendations.Subsequently, ICM Administrator, on the recommendation of the NSC-ICM and approval of the Central Government publishes the methodology on ICM Web Portal.

Concept for development of new methodology for agroforestry-based Carbon Offset Project will be prepared as per the following concept submission form for approval of the ICM Administrator (Bureau of Energy Efficiency):

Methodology Concept Submission Form

Purpose:

To be used when submitting new methodologies in accordance with ICM "Methodology Development and Adoption Procedure"

Part 1: General Details

1.	Name of the Organization (legal entity name):	
2.	Registered Address:	
3.	Address:	
4.	(where communication will be sent- e.g. Registered/Headquarters)	
5.	Telephone/Mobile:	
6.	E-mail:	
7.	Registered Address:	
8.	Nodal Persons: (point of contact with Administrator regarding ICM project cycle)	

Part 2: Proposed Methodology Details

1.	Title of the proposed methodology or tool:				
2.	Type: New:	☐	Methodology	☐	Tool
	Revision:	☐	Methodology	☐	Tool
	(Provide a brief statement on the proposed change in case of revision)				
3.	Sectoral Scope:				
4.	Summary of methodology idea:				
5.	Baseline Scenario:				
6.	Demonstration of Additionality:				
7.	Quantification of SDG Impacts:				
8.	Monitoring of SDGs:				
9.	Risks and Mitigation Plan:				

Date: .....

Version: 1.0

Indicative Approaches to be followed:

Scoping and Baseline Study

- Literature review of agroforestry systems and existing carbon methodologies
- Field surveys and stakeholder consultations.
- GIS and remote sensing tools to assess land-use changes and carbon stock baselines.

Carbon Potential Assessment

- Establish sample plots in diverse agroforestry systems.
- Biomass measurements using IPCC Tier II/III protocols.
- Soil carbon analysis and allometric equation application.

Methodology Design

- Define project boundary, baseline scenario, additionality tests.
- Emission reduction calculation protocols.
- Leakage, permanence, and uncertainty analysis.
- MRV and data management system design.

Pilot Testing and Validation

- Select pilot sites.
- Implement methodology.
- Monitor outcomes and refine methodology.

Finalization

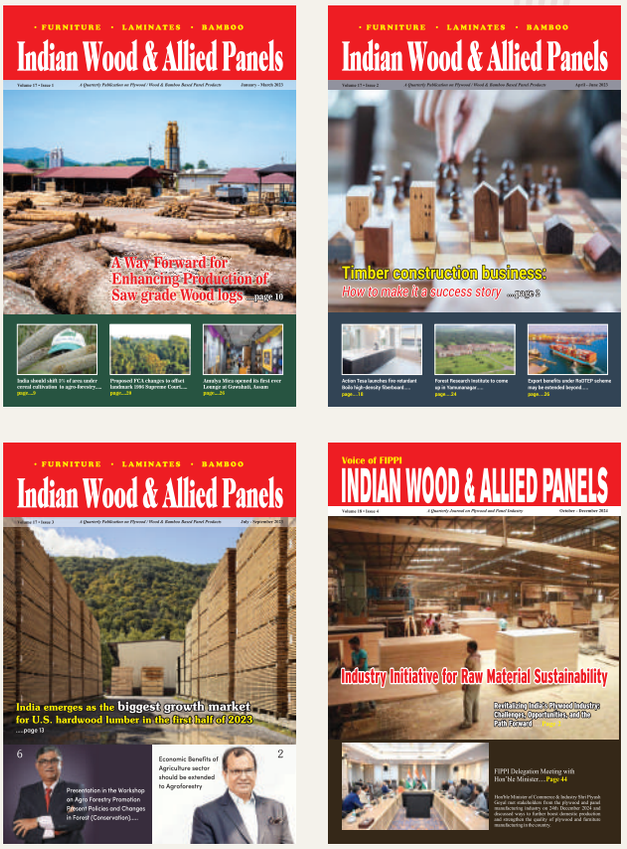
- Submit the methodology for stakeholder and expert review.
- Liaise with Bureau of Energy Efficiency and Ministry of Environment, Forest and Climate Change.
- Submission of methodology to the Bureau of Energy Efficiency for approval.
- Develop a toolkit and guidance manual.

Duration of the Study: 10 Months

Organisations Responsible for Developing the Methodology: ICFRE, Dehradun in collaboration with Federation of Indian Plywood & Panel Industry, New Delhi.

Principal Investigator from ICFRE:	**Dr. R. S. Rawat** Scientist 'E', Biodiversity and Climate Change Division Indian Council of Forestry Research and Education, P.O. New Forest, Dehradun – 248006 Email: rawatrs@icfre.org rsbrawat@gmail.com Phone No. 0135-2224803 Mobile No. 9456565525.❑

FEDERATION OF INDIAN PLYWOOD AND PANEL INDUSTRY



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FIPPI-ICFRE Collaboration Moves Forward on National Agroforestry Carbon Credit Method

FEDERATION OF INDIAN PLYWOOD & PANEL INDUSTRY

REGISTERED UNDER THE SOCIETIES REGISTRATION ACT XXI OF 1860, REGN. NO. S/2985/1968-69 DT. 4.1.1969

1005, VIKRANT TOWER, 4, RAJENDRA PLACE, NEW DELHI110 008, INDIA
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FIPPI/125-3/2025-26 Date: 10.06.2025

To,
Smt. Kanchan Devi
Director General,
Indian Council of Forestry Research and Education (ICFRE)
P.O. New Forest, Dehradun – 248006.

Subject: Acceptance of Project Proposal on "Development of Methodology for Agroforestry- Based Carbon Offset Projects for the Indian Domestic Carbon Market."

Ref.: Your letter No. 1-10/2023/BCC/ICFRE/106 dated 5 June 2025.

Dear Madam,

We extend our sincere appreciation to the Indian Council of Forestry Research and Education (ICFRE) for submitting the detailed and timely project proposal titled "Development of Methodology for Agroforestry-Based Carbon Offset Projects for the Indian Domestic Carbon Market".

2. We are pleased to inform you that the Federation of Indian Plywood and Panel Industry (FIPPI) is in agreement with the project proposal along with the scope, objectives, and approach outlined in the proposal. We are happy to convey that one of our esteemed member industries shall sponsor the project as part of its Corporate Social Responsibility (CSR) contribution. In this regard, we kindly request you to share the designated CSR number and associated funding details to facilitate the smooth transfer of funds and initiation of project activities.

3. Additionally, we believe that the concept of developing such a method should be brought to the attention of the Hon'ble Secretary, Ministry of Environment, Forest and Climate Change, Government of India, who also serves as the Ex-Officio Co-Chairperson of the National Steering Committee for the Indian Carbon Market. The Ministry's awareness and endorsement will further ensure alignment of this methodology with national carbon market policies and frameworks.

We look forward to a fruitful collaboration with ICFRE on this strategic and forward-looking project.

Warm regards,

Dr. M. P. Singh
Director General,
Federation of Indian Plywood and Panel Industry (FIPPI)
New Delhi

Promoting Sustainable Raw Material Sourcing for Wood-Based Industries: FIPPI Submits Inputs on Mandatory Plantation and Policy Proposals to Support Agroforestry

FEDERATION OF INDIAN PLYWOOD & PANEL INDUSTRY

REGISTERED UNDER THE SOCIETIES REGISTRATION ACT XXI OF 1860, REGN. NO. S/2985/1968-69 DT. 4.1.1969

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FIPPI/80/3-2023-24 June 23, 2025

To,

Shri Piyush Goyal
Hon'ble Minister of Commerce & Industry
Government of India
Department for Promotion of Industry and Internal Trade
Vanijya Bhawan, New Delhi-110011

Subject: Inputs on Mandatory Plantation by Wood Based Industries.

Dear Sir,

Federation of Plywood and Panel Industries (FIPPI) is happy to understand that Government of India is eager to evolve workable solution to the issue of scarcity of wood that Wood Based Industries are facing in India for decades.

1. The total production of timber from forests was about 10 million cubic metres per although the country's requirements were estimated to be about 15 million cubic metres (National Commission on Agriculture, 1972). On the recommendations of National Commission on Agriculture, (NCA, 1972) on 'Production of Man-made Forests', many states in India established Forest Development Corporations to undertake industrial plantations on commercial basis. However, the gap between demand and supply of timber widened day by day. Further shifting focus to conservation forestry National Forest Policy of 1988 was promulgated outlining a separate roadmap for forest/wood-based industries which includes following provisions:

i. As far as possible, a forests/wood-based industry should raise the raw material needed for meeting its own requirements, preferably by establishment of a direct relationship between the factory and the individuals who can grow the raw material by supporting the individuals with inputs including credit, constant technical advice and finally harvesting and transport services.

ii. No forest/wood-based enterprise, except that at the village or cottage level, should be permitted in the future unless it has been first cleared after a scrutiny about assured availability of raw material.

iii. Forest/wood-based industries must not only provide employment to local people on priority but also involve them fully in raising trees and raw-material.

iv. Natural forests serve as a gene pool resource and help to maintain ecological balance. Such forests will not,

therefore, be made available to industries for undertaking plantation and for any other activities.

v. Farmers, particularly small and marginal farmers, would be encouraged to grow, on marginal/degraded lands available with them, wood species required for industries. These may also be grown along with fuel and fodder species on community lands not required for pasture purposes, and by forest department/ corporations on degraded forests, not earmarked for natural generation.

2. In view of above policy decision wood-based industries are engaging with farmers to undertake agroforestry to produce wood which is a sustainable system providing additional income to farmers. The data for plantation taken up by the leading wood-based industries by the end of 2024 illustrate the encouragement to farmers for agroforestry as follows:

- Century Plyboards (India) supplied around 17 million seedlings covering around 26,000 acres of land.
- Greenply planted around 64.3 million saplings, covering approximately 90451 acres near its manufacturing units.
- Merino industries Ltd. planted around 21 million saplings covering around 13,651 acres of land.
- Action TESA distributed more than 11.46 million high-yielding clonal saplings, covering approximately 11,463 acres of land.
- Rushil Décor Limited as a part of its green initiative, planted around 24 million saplings across various districts.

However, it is pertinent to mention that it is not possible for the WBIs to own sufficient private land for undertaking farm forestry due to limitation of land holding in almost all states of the country. It is to further emphasize that productions of industrial wood under sustainable management of forests by state forest departments (SFDs) for WBIs have decimated over the years. However, the import of wood and wood products was brought under Open General License (OGL) category in 1996 which has provided alternate option to source timber from outside the country in case of acute scarcity. To overcome such limitations, Wood based Industries have been advocating for the use of degraded forest and wasteland for captive plantations to tackle wood scarcity.

3. There are options to promote plantation forestry on degraded forestlands, not earmarked for natural regeneration and other wastelands belonging to Govt bodies including PSUs or Communities.

Option A: Direct allotment of area under plantation working circles to the individuals (as provided in Forest Rights Act) or WBIs with the condition of undertaking only forestry plantation, not any non-forestry activity. In Vietnam, this system has brought forest transition in regenerating degraded forestlands and increased forest cover while supplying timber to WBIs.

Option B: Indirect association of WBIs through Green Credit Scheme with suitable modifications in the present guidelines to include production forestry for WBIs on degraded forestlands, not earmarked for natural regeneration.

Option C: Lands other than forests belonging to PSUs like NHAI, SAIL, CCL, Govt Departments/Institutions, Community lands may be brought under production forestry in association with WBIs.

3. Even optimising the potential of Agroforestry in India has been very challenging in past decades mainly on account of extending forests-based restrictive act and rules on timber grown by farmers in various forms in different states of India. Few states (Haryana, Punjab) not having extensive forests have shown good results in wood productions from agroforestry systems. Other states with extensive forests have not relaxed regulatory control regime on cultivation of trees on farmers' lands. To optimise the potential of agroforestry in India, we need to implement the National Forest Policy (2014) by enacting suitable Agroforestry (facilitation and promotion) Act (copy enclosed as Annexure 1) which enables farmers

a. to have a framework for electronic Certificate of Origin and Ownership and establish a standard for the legality and chain of custody of farm wood that is accepted worldwide (Vocal for Local) to promote efficient,

transparent, and barrier-free inter-state and intra-state trade and commerce of farm wood free from restrictive regime of Forest Acts and Rules

b. framework for certification of nurseries, seeds and other planting materials through institutional mechanism for registration of nurseries and their accreditation to farmers

c. national guidance framework on agreements for growing farm wood to facilitate establishment and promotion of farm wood-based enterprises and matters related to providing institutional credit and insurance cover to agroforestry or incidental thereto

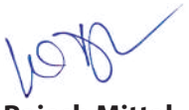
d. legal framework for hassle-free transportation, marketing and utilization of wood grown on non-forest lands to promote the growing of trees outside forests and double the income of farmers.

4. Alternately Ministry of Environment, Forest and Climate Change can provide a framework in the form of Green Credit Scheme (copy attached as Annexure 2) or Carbon Credit Scheme (Annexure 3) for tree plantations outside forests for the association and participation of WBIs for growing trees on the farmers' lands. Subsequently these Green credits or carbon credits generated for agroforestry or plantation outside forests can be made obligatory for WBIs based on consumption of wood or production of wood products.

In absence of any framework to associate WBIs with the farmers for undertaking plantations, mandatory plantation obligation may turn counterproductive. Federation of Indian Plywood and Panel Industry requests Government of India to provide either a legislative workable framework or market- based credit scheme to bring sustainability in raw materials for WBIs. This Wood Based Industry has an immense potential to meet the country's need towards an Atma Nirbhar Bharat, by providing employment at the rural level, supporting Agroforestry and enhancing agricultural income of farmers, substituting imports with indigenous manufactured products apart from providing the country with an expanded green cover to help mitigate climate change.

We would be grateful if you could spare some time at your convenience to meet with us. Thank you for considering our request. We look forward to your positive response.

With regards,



Rajesh Mittal
President (CMD, Green Ply)
Federation of Indian Plywood and Panel Industry

ANNEXURE I
DRAFT AGROFORESTRY (Promotion and Facilitation) ACT, 2025

An Act to implement the objectives and provisions of National Agroforestry Policy; to encourage and expand tree plantation in a complementary and integrated manner with crops and livestock; to improve productivity and livelihood of farmers while also meeting raw material requirements of wood-based industries and to reduce reliance on imports from foreign countries;

WHEREAS the policy document identifies various factors such as restrictive legal provisions for harvesting and transportation of trees planted on farm lands, inadequate attempts at liberalization of restrictive regulations, near non-existent extension mechanisms, lack of institutional support mechanisms, lack of quality planting materials, inadequate research on agroforestry models and species suitable across various ecological regions, inadequate marketing infrastructure and price discovery mechanisms, lack of post-harvesting processing technologies and industry operating at a sub-optimal level etc. for agroforestry not gaining the desired importance as a development tool;

AND WHEREAS the agricultural lands in India provide an opportunity to supply wood along with food, while simultaneously meeting the objective of creating carbon sinks, which is also in line with India's commitment to the Paris Climate Agreement;

AND WHEREAS forests in India, although seemingly adequate in area, are primarily committed to demands such as fuel, fodder and timber for indigenous people, and are required to be maintained and improved for various ecosystem services and conservation of biological diversity, hence limiting the production of wood;

AND WHEREAS growing of trees on private lands outside forests has played an important role in catering to domestic timber demand in India and stabilizing the forest and tree cover of the country, by not only adding

to area under tree cover but also providing a substitute to the timber harvested from forests and hence, conserving the forests for ecological functions;

AND, it is necessary to transcend the boundaries of the forests in order to meet India's wood requirements from within the country (Atmanirbharta), to reduce pressure on the forests, and consequently, to increase carbon sequestration by various landscapes to fight global warming;

AND, it is necessary to have a framework for electronic Certificate of Origin and Ownership and establish a standard for the legality and chain of custody of farm wood that is accepted worldwide (Vocal for Local) to promote efficient, transparent, and barrier-free inter-state and intra-state trade and commerce of farm wood;

AND, it is necessary to promote and facilitate certification of nurseries, seeds and other planting materials through institutional mechanism for registration of nurseries and their accreditation to farmers;

AND, it is necessary to establish institutional mechanism investing in research, extension and capacity building and related services;

AND, it is necessary to establish a national guidance framework on agreements for farm wood to facilitate establishment and promotion of farm wood-based enterprises and matters related to providing institutional credit and insurance cover to agroforestry or incidental thereto.

NOW, THEREFORE, it is expedient to enact a legal framework for hassle- free transportation, marketing and utilization of wood grown on non-forest lands in order to promote the growing of trees outside forests and double the income of farmers.

BE it enacted by Parliament in the Year of the Republic of India as follows:—

CHAPTER 1

PRELIMINARY

1. Short title, extent and commencement—

(1) This Act may be called Agroforestry (Promotion and Facilitation) Act, 2025.

(2) It extends to the whole of India.

(3) It shall come into force on such date as the Central Government may, by notification in the Official Gazette, appoint.

2. Definitions — In this Act, unless the context otherwise requires, -

(i) "AgriWood-India" means the standard developed for timber legality assessment and verification of legality and legal origin of farm wood and farm wood products in India.

(ii) "Trees outside forests" mean trees located on all lands excluded from the definition of forests as per prevalent laws and their interpretation, subject to the limitation of their applicability to

private property. They include:

(a) Trees on farmlands and built-up areas, both in rural and urban areas;

(b) Planted or domesticated trees on private lands;

(c) Trees growing in meadows, pastoral areas and on farms, or in towns, gardens and parks; and

(d) Trees growing on lands using alley cropping and shifting cultivation, permanent tree cover crops (e.g. coffee, cocoa), windbreaks, hedgerows, home gardens and fruit-tree plantations.

(iii) "Farm wood" includes timber, small timber, fuelwood and all other parts of trees outside forests when they have fallen or have been felled, and all wood, whether cut up or fashioned or hollowed out for any purpose or not; and this farm wood and its products:

(a) Shall not be understood as 'Forest Produce' or 'Specified Forest Produce' within the meaning of the provisions of the Indian Forest Act, 1927 or any other State or Central Acts;

(b) Shall not be understood as "Scheduled Farmers' Produce" under any State APMC Act or Regulation;

(c) Shall not be understood as 'Biological Resources' within the meaning of the provisions of the Biological Diversity Act, 2002.

(iv) "Imported wood" means all wood and wood products imported from other countries.

(v) "Tree growers" mean individuals or organizations engaged in the production of farm wood by themselves or by hired labour or otherwise, and includes farmers, Farmer Producer Organisations, Forest Protection Committees, wood-based industries, companies, partnership firms, limited liability partnerships, co-operative societies, societies, and any associations or body of persons duly incorporated or recognized as a group under any ongoing programmes, schemes or resolutions of the Central Government or the State Government.

(vi) "Trader or agent" means a person who buys farm wood or imported wood by way of inter-state or intra-state trade or a combination thereof, either for self or on behalf of one or more persons for the purpose of wholesale trade, retail, end-use, value addition, processing, manufacturing, export, consumption or for such other purpose.

(vii) "Inter-state trade" means the act of buying or selling of farm wood, wherein a trader or agent of one state buys farm wood from tree growers or a trader of another state and such farm wood is transported to a State other than the State in which the trader purchased such farm wood or where such farm wood originated.

(viii) "Intra-state trade" means the act of buying or selling of farm wood, wherein a trader of one State buys the farm wood from a tree grower or a trader of the same State in which the trader purchased such farm wood or where such farm wood originated.

(ix) "Electronic trading and transaction platform" means a platform set up to facilitate direct and online buying and selling for conduct of trade and commerce of farm wood through a network of electronic devices and internet applications, where each such transaction results in physical delivery of farm wood.

(x) "State" means State or Union territory (UT).

(xi) "State Agriculture Produce Market Committee Act" or "State APMC Act" means any State legislation in force in India, by whatever name called, which regulates markets for agricultural produce in that State.

(xii) "Farming agreement" means a written agreement between the tree grower and sponsor, such as:

(a) 'Trade and commerce agreement', where the ownership of farm wood remains with the tree grower during production and he gets the price of produce on its delivery as per the agreed terms with the sponsor;

(b) 'Production agreement', where the sponsor agrees to provide farm services, either fully or partially, and to bear the risk of output; and

(c) Any other such agreements or a combination of the agreements specified above.

(xiii) "Sponsor" means a person, trader or agent who has entered into a farming agreement with the tree grower for growing trees.

(xiv) "Local bodies" means Panchayats and Municipalities, by whatever name called, within the meaning of Article 243B (1) and Article 243Q (1) of the Constitution of India, and, in the absence of any Panchayat or Municipality, institutions of self-government constituted under any other provision of the Constitution of India or any Central or State act, and in their absence, any officer or group of officers authorised by the state government.

(xv) "Wood-based industries" include housing, construction, packaging, furniture, handicrafts, sports, railways, ship building, mining, bioenergy, pulp and paper, plywood and panel industries, and such other industries.

CHAPTER 2

GENERAL

3. Power to make rules for standards with regard to planting stock— The Central Government shall have the power to make standards or delegate such powers to any other institution or state bodies to establish systems for the followings:

(i) Release new clones or cultivars for timber species;

(ii) Wood productivity claims by any entity;

(iii) Accreditation of nurseries and certification of seeds and quality planting stock; and

4. Power to make rules or standards regarding the legality of farm wood— The Central Government shall have the power to make standards or delegate such powers to any other institution or state bodies:

(i) to make rules or delegate its function for the establishment Information Technology-based systems (also through mobile apps) for issuance of Certificate of Origin and Ownership ("COO") to all tree growers, which may be used for all purposes of trading and transaction of farm wood, insurance and collateral guarantee for banking support including future trading;

(ii) to include following information and documents needed to fulfil the requirement of due diligence system:

(a) Description, including trade name and type of relevant commodities and products as well as, where applicable the common name of the species and its full scientific name

(b) Quantity of the relevant products (No./mass/ volume)

(c) Identification of the area (district, state) of production

(d) Geo-coordinates of al the plots of land where relevant products produced with date

(e) Names and address of the businesses/persons from whom they have been supplied relevant products and to whom the products have been supplied

(iii) to authorise 'local bodies' to be second-party certifiers for the issuance of COO to the first party (tree growers) in the IT based system mentioned in (i) and risk assessment mechanism verifiable through remote controls for due diligence;

(iv) to authorize traders, agents or industries as third-party certifier through Information Technology-based systems (also through mobile apps) for issuance of Certificate of Origin and Ownership ("COO") and to mark and grade farm wood according to the AgiWood-India Standards;

(v) to prescribe a system in India for electronic registration of a trader or agent to "Electronic trading and transaction platform" and of the modalities of chain of custody along production, harvesting, transport, trading and consumption, in order to corroborate the legality and chain of custody of farm wood with minimal cost to tree growers and sponsors;

(vi) to prescribe for IT based online registration of such Wood-based industries and enterprises conforming to above provisions of legality of farm wood so as to promote demand for such farm wood and help farmers increase their income;

5. Inter-state or intra-state trade and commerce — Subject to the provisions of this Act, any tree grower, trader, or electronic trading and transaction platform shall have the freedom to carry on inter-state or intra- state trade and commerce in farm wood in a trade area.

6. Power to make rules for national framework on farming agreements— The Central Government or institution authorised by the central government shall prescribe rules or guidelines for a national framework on farming agreements between tree growers (farmers) and sponsors for growing trees that protect and empower tree growers to engage with sponsors at a mutually agreed remunerative price framework in a fair and transparent manner, and for matters connected therewith or incidental thereto or delegate such powers to state bodies for a particular state.

CHAPTER 3

OF AGROFORESTRY BOARDS

7. Constitution of Agroforestry Board of India—

(1) The Central Government shall prescribe for constitution of an Agroforestry Board of India to provide for improved linkages between tree growers, traders or agents, farm wood-based industries or enterprises, research institutes and

related government representatives including the states.

(2) The Agroforestry Board of India shall be under the Chairmanship of the Minister-in-charge, Ministry of Agriculture or any eminent personality from the agroforestry sector nominated by the Minister-in-charge.

(3) The Agroforestry Board of India shall function at New Delhi under the ministry of agriculture investing in research, extension and capacity building, coordination and related services;

8. Constitution of Agroforestry Board at the State level and the regional level —

1) Agroforestry Boards shall be constituted at the State level as well as the regional or district level by resolutions of respective State Government. The Chairmanship of such council shall be the Chief Minister of the respective State or an eminent personality from agroforestry sector nominated by the Chief Minister of the respective State.

(2) The State and regional or district-level Agroforestry Boards shall function under the overall guidance of the Agroforestry Board of India.

(3) The regional or district-level Agroforestry Boards shall function under the overall guidance of their respective State-level Agroforestry Board, and the decisions of their respective State-level Agroforestry Board shall be binding on them.

9. Functions of State-level and regional-level Agroforestry Boards— The State-level and regional-level Wood Councils:

(1) Shall facilitate vertical integration of the above-mentioned linkages between all stakeholders;

(2) Shall ensure less transportation cost and fix minimum and maximum price of local farm wood in their areas based on market chain analysis;

(3) Shall remove the widespread mismatch between demand and supply of farm wood at the State and the regional level;

(4) May have their own electronic trading and transaction platform for intra-state trade and commerce in their area following the chain of custody regime electronically.

10. Powers of State-level Agroforestry Board—

(1) The State-level Agroforestry Board shall be the final authority on the establishment and promotion of farm wood-based industries to encourage all farm wood industries, especially new establishments, to promote farm forestry plantations and monitor progress of the same to ensure sustainable farm wood supply to all wood-based industries in the State.

(2) The State-level Agroforestry Board shall be the final authority on demarcation and designation of any catchment area for trader, agent and sponsor so as to encourage tree growers (farmers) to grow trees on their lands.

(3) It shall decide on incentive programme, if any for the farmers who grow trees, depending upon the succession rate after one year of plantation for continuing the plantation for longer time.

(4) The State-level Agroforestry Board shall be empowered to provide for upgradation and deployment of tools and techniques for on-site harvesting, conversion, peeling, veneering, impregnation, modification, seasoning, storage and other such value additions to farm wood, notwithstanding any other provisions in any other Acts.

CHAPTER 4

PENALTIES AND JURISDICTION

11. Power to levy fine— Whoever contravenes the provisions of this Act or the rules made thereunder shall be liable to pay a fine levied by the regional-level or State-level Agroforestry Board or the Agroforestry Board of India, which shall be not be less than twenty five thousand rupees but which may extend up to twenty five lakh rupees, and where contravention is a continuing one, further penalty not exceeding five thousand rupees for each day after the first day during which the contravention continues.

12. Appeals—

(1) Appeal against the decision of regional or district level Agroforestry Board shall lie only to State-level Agroforestry Board.

(2) Appeal against the decision of the State-level Agroforestry Board shall only lie to Agroforestry Board of India.

13. Bar of jurisdiction of civil court— No civil court shall have jurisdiction to entertain any suit or proceedings in respect of any matter, the cognizance of which can be taken and disposed of by any authority empowered by or under this Act or the rules made thereunder.

CHAPTER 5

MISCELLANEOUS

14. **Power of Central Government to give directions—** The Central Government may, for carrying out the provisions of this Act, give such instructions, directions, orders or issue guidelines as it may deem necessary to any authority or officer subordinate to the Central Government, any State Government or any authority or officer subordinate to a State Government, and traders and sponsors.

15. **Indemnity for acts done in good faith—** No suit, prosecution or other legal proceedings shall lie against the Central Government or the State Government, or any officer of the Central Government or the State Government or any other person in respect of anything which is, in good faith, done or intended to be done under this Act or of any rules or orders made thereunder.

16. **Act to override other laws—** Save as otherwise provided in this Act, the provisions of this Act shall have effect, notwithstanding anything inconsistent therewith contained in any State Act or any other law for time being in force or any custom or usage or any instrument having effect by virtue of any law.

ANNEXURE II

Draft Methodology for Tree Plantation for Green Credits in Areas Outside the Lands of the State Forest Departments and the Draft Methodology for Calculation of Green Credits

An Act to promote the participation of wood-based and other industries in tree cultivation outside the forest areas and to discourage import of large sized timber; to provide an opportunity to the farmers to earn additional income through the cultivation of commercial timber species; to promote cultivation of trees outside the forest areas so that the pressure on the natural forests is reduced; to provide an opportunity to the wood-based and other industries to grow their own raw material requirement of large timber.

- WHEREAS, India has been importing large amount of timber from Africa, Asia, Europe and South America to meet the domestic requirements
- WHEREAS, Trees Outside the Forests (TOF) have been contributing to more than 90 % of domestic timber supply
- WHEREAS, there is a need to promote cultivation of industrially important tree species in the land of the farmers with the participation of industries, especially wood-based industries
- WHEREAS, the Green Credit Rules, 2023, which were published in the Gazette of India, Extraordinary, Part II, Section 3, Sub Section (ii), vide S.O. 4458(E), dated the 12th October, 2023, provide an opportunity for participation of industries, other entities and individuals for participation in plantation programs and earn Green Credits
- AND WHEREAS Sub-Section (2) (i) of Section 4 of the Green Credit Rules, 2023 provides for tree plantation as eligible measures/activities under the Green Credit Program
- AND WHEREAS Section 5 of the Green Credit Rules, 2023 provides that the methodology for calculating the green credit in respect of any activity undertaken shall be such as may be notified by the Central Government on the recommendation of the Administrator
- AND WHEREAS Section 7 of the Green Credit Rules, 2023 designates the Indian Council of Forestry Research and Education (ICFRE) as the Administrator responsible for the effective implementation of the Green Credit Program including its management and operation.
- AND WHEREAS Sub-Section (3) of Section 7 of the Green Credit Rules, 2023 provides the responsibilities of the Administrator including development of guidelines, processes and procedures for the implementation of the Green Credit Program under these rules; and development of methodologies, registration process, guidelines and associated measurement, reporting and verification mechanism.
- AND WHEREAS for the involvement of wood-based industries dealing with paper, pulp, plywood and solid wood material, it is imperative

to promote cultivation and retention of trees for at least a period of five years up to 20 years of more. A tentative list of the species list is given below:

- o For paper pulp wood (rotation of 5-7 years)- Eucalyptus, Acacia auriculiformis, Acacia mangium, Acacia hybrid, Casuarina species, Melia dubia
- o For plywood (rotation of 8-15 years) - Acacia auriculiformis, Acacia mangium, Acacia hybrid, Casuarina species, Melia dubia, poplar species, silver oak, Acrocarpus fraxinifolius, Kadamba etc
- o For furniture (rotation of 15 years and more)- Dalbergia sissoo, Mango, Acacia nilotica, teak, Artocarpus species, Gmelina arborea (gamar), Khair, agarwood, rosewood, red sanders, sandalwood etc.

- AND NOW, THEREFORE in exercise of the powers conferred by Section 3, Section 6 and Section 25 of the Environment (Protection) Act, 1986 (29 of 1986), and Section 5 of the Green Credit Rules, 2023, the Central Government has now proposed a notification for 'Draft Methodology for Tree Plantation for Green Credits in Areas outside the Lands of The State Forest Departments and the Draft Methodology for Calculation of Green Credits' for the information of the public likely to be affected thereby and notice is hereby given that the said notification will be taken into consideration on or after the expiry of a period of 60 days from the date of publication of the draft in the official Gazette;
- The objections or suggestions, which may be received from any person with respect to the said Notification within the period specified above, will be taken into consideration by the Central Government;
- Objections or suggestions, if any, may be addressed to the DCF, Green Credit Cell, ICFRE, FRI Campus, New Forest, Dehradun-248006, and may be sent to e-mail id: dg@icfre.org

Draft methodology for tree planting in areas outside the lands of State Forest Departments for green credits:

1. For the purpose of tree plantation outside the lands of State Forest Departments for green credits, three categories of lands are proposed as below:

(i) Individual land holdings of private Land Owners (PLO)

(ii) Land owned by Non-Forest Government Departments (NFGD) including PSUs and Autonomous organizations of the State or Central government.

(iii) Land owned by private Companies, Associations, Societies, SHGs, Trusts, and Local Bodies including Panchayats and Municipal areas (CAS)

2. The three categories of land holders shall be collectively referred to as 'Land Owner'.
3. The Land Owner/individual/company/entity can enter into agreement with any Land Owner mentioned in point number 1 above for raising of plantations on mutually agreed terms and conditions and such Land Owner/individual/company/entity which funds or provides financial or other support for such plantations shall be referred to as 'Sponsor'.
4. The terms and conditions of the agreement on the mode of funding, extent of funding or other modes of support, modalities of harvest and disposal of usufructs etc shall be as per the agreement between the Sponsor and the Land Owner and the Administrator shall have no role in it.
5. Agreement can be in the following three categories:

a. 'Trade and Commerce Agreement' where the ownership of the usufructs from the plantation remains with the Land Owner as per the agreed terms with the Sponsor.

b. 'Production and Technical Support Agreement' where the Sponsor agrees to provide the input costs or technical support and either fully or partially and bears the risk of output.

c. Any other such agreement or a combination of the agreements as mentioned above.

6. The agreement shall have clauses on the incentives or support to be given by the Sponsor to the Land owner for cultivation and retention of the trees for a minimum period of 5 years or more.
7. Under this methodology Green Credit can be awarded to the Land Owner and/or the Sponsor by the Administrator for the plantations taken up in their own lands or on others' land as per agreements which are outside the lands of the State Forest Departments.
8. For claiming Green Credit, the minimum land holding for PLO shall be 1 acre and 1 hectare (2.5 acres) for NFGD and CAS.

9. The implementing organization for this scheme shall be ICFRE as Administrator and the nine regional ICFRE institutes shall be the regional nodal bodies (the regional ICFRE institutes and their jurisdictional States are mentioned in the Appendix I)
10. The Land Owner or the Sponsor shall apply to the concerned regional Institute of ICFRE online in a prescribed format expressing interest to take up plantations under the Green Credit Program.
11. While applying for registration, the following points shall be adhered to by the Land Owner:

(i) Baseline data - geotagged photo(s) of the proposed location along with list of existing trees and GPS boundary of site(s) shall be provided.

(ii) Land ownership record- Name, Aadhar, PAN (if available) and bank details of authorized representative shall be provided.

(iii) Copy of the Agreement between the Land Owner and the Sponsor.

(iv) Details of plantation plan mentioning the area, the species to be planted, the number of the plants, source of the plants

(v) A commitment to maintain plantation up to 5 years shall be provided in the form of a certificate.

12. The regional ICFRE institute shall scrutinize the application of the Land Owner/Sponsor for registration and in case of any lacunae, will ask the Land Owner/Sponsor to correct and resubmit. The regional ICFRE institute shall charge a nominal fee for scrutiny of the applications.
13. If the application of the Land Owner/Sponsor is satisfactory or after receiving the corrected application from the Land Owner/Sponsor, the regional ICFRE institute shall forward it to the Administrator for further processing and approval.
14. Once the approval is granted by the Administrator based on the recommendation of the regional ICFRE Institute, the Land Owner/Sponsor can go ahead with the plantation.
15. Irrespective of the area of the plantation or the number of plants in the plantation, the nodal organization for monitoring the progress of plantation shall be the regional ICFRE institute.
16. On the basis of availability, regional ICFRE institutes or their authorized/technically validated nurseries may provide Quality Planting Material (QPM) to Land Owner /Sponsor on payment basis.
17. The State Forest Departments may also provide QPM to Land Owner /Sponsor on demand to the Land Owner in case of availability, on payment basis.
18. The regional ICFRE Institute and/or the SFD can provide technical input/guidance to the Land Owner for raising the plantations, if sought.
19. The regional ICFRE institute shall act as a nodal office for receiving the application of the interested parties online, forwarding it to the Administrator with recommendation and recording the status of the land before the commencement of the plantation.
20. The regional ICFRE institute shall check the status of the plantation sites three months after the completion of the plantation and twice every year after that.
21. The regional ICFRE institute shall maintain all the records of such plantations made by the Land Owner for Green Credit in a format as prescribed by the Administrator.
22. The regional ICFRE Institute shall send the prescribed formats to Administrator every six months.
23. The Land Owner /Sponsor shall pay the regional ICFRE institute a fixed charge every year for annual evaluation.
24. The Land Owner /Sponsor shall upload geotagged photos (minimum 4 taken at different locations in the same plantation) of the plantation in the website of the regional ICFRE institute once three months after completion of the plantation and thereafter once in every six months.
25. Only forestry tree species shall be considered for calculation of Green Credit and horticulture crops such as guava, sitaphal, apple, avocado, etc shall not be considered for Green Credit.
26. NTFP yielding tree species such as wild mango, Garcinia, amla, harra, baheda, tamarind etc shall be considered for Green Credit.
27. Shrubs, climbers, herbs and medicinal plants (either herbs or shrubs) shall not be considered for calculation of Green Credit.
28. The Sponsor/Land Owner shall not plant less than 160 trees per hectare and the upper limit shall be 1100 trees per hectare.
29. There is no restriction on the forestry tree species which can be planted and there is no ban on the plantation of exotics in the lands by the Land Owner /Sponsor. The Land Owner /Sponsor shall

follow the rules of the concerned State Forest Departments for the harvest of the usufructs.

The draft methodology for calculation of green credits for tree plantation done in areas outside the lands of State Forest Departments:

1. To be considered eligible for Green Credit, the plantation needs to be maintained for a minimum duration of 5 years.
2. The Green Credit shall be calculated at the rate of one Green Credits per tree grown for every five years.
3. For every additional five years, one Green Credit will be awarded to the Land Owner. For example, if a sandalwood seedling is planted and maintained for 15 years, the Land Owner/Sponsor will get 3 Green Credits (1 Green Credits for the first five years and 2 Green Credit for the next 10 years).
4. The allotment of Green Credits shall be done in a phased manner, as mentioned below:

Calculation of issuance of Green Credit (GC)		
Year *	Year wise distribution of GCs in percentage	
At the end of 1st year of plantation	30	*For 100 trees, value of GCs to be distributed to eligible applicant for 5 years =100 GCs.
At the end of 3rd year of plantation	30	
At the end of 5th year of plantation	40	
Total	100	

5. There will not be any factional Green Credits.
6. After 10 years, an additional one GC shall be awarded to every tree for every 5 years of survival. For example, a tree maintained for 15 years will earn 3 GC and a tree maintained for 20 years will earn 4 GC and so on.
7. From a minimum of 160 trees per hectare to a maximum of 1100 trees per hectare can be planted but the calculation of GC would be based on the total number of the surviving trees at 5th, 10th, 15th, 20th year.
8. The Land Owner/Sponsor are free to trade the Green Credit online in exchange for money or any other benefits as prescribed.
9. The Administrator can decide about the modalities of the transfer of money to be paid by the industries/PSUs/Govt bodies/NGOs etc to the Land Owner /Sponsor in exchange for one Green Credit but this is not binding and shall be taken as a minimum benchmark below which Green Credit shall not be traded.
10. There won't be any consideration for Green Credit if the plantations are felled by the Land Owner/ Sponsor before the completion of 5 years.

The entire process of Tree Plantation in lands outside the forest lands of State Forest Departments for Green Credit and Calculation of Green Credit shall be as below:

(i) Registration of the project proponent
(ii) Project submission (along with MoU if any between Sponsor and CAS)
(iii) Project Registration
(v) Monitoring and Verification
(vi) Issuance of Green Credits
(vii) Trading of Green Credits

Some points for consideration, based on suggestions

1. Scheme is open to all Non-Forest government lands- railways, PWD, Housing societies, schools etc.
2. If sponsors are available, young entrepreneurs also can take up plantation work professionally in the land of the Land Owner or on their own in their own land.
3. The agreement terms and conditions between the Land Owner and the sponsors cannot be clearly defined. It is between the two parties and they can decide how long they want to continue with the Agreement.
4. If the factories are supposed to cover 33 % of the factory land area with green cover, purchasing these credits to offset those conditions may not be a good idea as that condition of 33 % is site-specific.
5. It will always be logical to check which species in the State where plantations are being taken are exempted from restrictions on harvest, transportation and sale and then prefer those species.
6. What are the QPM and how to define the QPM? -may not be under the ambit of this proposal.
7. It may be difficult (and cumbersome to verify) to specify the species for each State and number of plants per hectare for each species. The minimum and maximum numbers have been proposed and further restrictions may not be conducive to promote the scheme.❑

Simplifying Trees Outside Forests (ToF) Certification for Wider Participation: FIPPI Urges IFWCS Reforms to Support Farmers and Align with Global Trade Norms

FEDERATION OF INDIAN PLYWOOD & PANEL INDUSTRY

REGISTERED UNDER THE SOCIETIES REGISTRATION ACT XXI OF 1860, REGN. NO. S/2985/1968-69 DT. 4.1.1969

1005, VIKRANT TOWER, 4, RAJENDRA PLACE, NEW DELHI110 008, INDIA
Phone No.: +91-11-2575 5649 • **E-mail:** fippi@fippi.org • **Website:** www.fippi.org

Chief Patron	Patrons	President	Senior Vice President	Vice Presidents	Director General
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FIPPI/212-2025 June 18, 2025

Trees Outside Forests ToF CERTIFICATION

To,
The Inspector General of Forests (SU),
Ministry of Environment, Forest and Climate Change,
Indira Paryavaran Bhavan,
Jor Bagh Road,
New Delhi – 110003

Subject: Request for Simplification of Trees Outside Forests (ToF) Certification Criteria under IFWCS.

Respected Sir,

I write to you on behalf of the Federation of Indian Plywood and Panel Industry (FIPPI), with reference to the Indian Forest and Wood Certification Scheme (IFWCS), and specifically, the certification framework for Trees Outside Forests (ToF). First and foremost, we commend the Ministry's initiative in launching a comprehensive certification mechanism to promote sustainable management of both forests and ToF areas. This is a timely and strategic move aligned with global trends and sustainability expectations, including those from international markets such as the European Union. However, we would like to bring to your kind attention certain practical considerations regarding the ToF certification process.

ToF-based tree cultivation is inherently a self-sustaining and decentralized activity, often carried out by individual farmers, communities, and agroforestry practitioners across the country. Imposing stringent criteria and indicators related to biodiversity conservation and other aspects, as applied in natural forest management, may create unintended burdens on small-scale tree growers who lack the capacity or ecosystem to comply with such extensive requirements without any intended benefits. Agroforestry in itself is a sustainable practice as detailed in Agroforestry Policy of 2014 of Government of India.

In this context, we respectfully propose the following for your consideration:

1. **Simplification of Criteria, Indicators, and Verifiers (CIVs) specific to ToF certification.**

   CIVs should be streamlined, focusing on traceability, legality, and sustainable harvest, rather than ecological complexity

2. **Emphasis should be laid on:**

   Certificate of Origin: Ensuring the wood's legal and geographical provenance. Chain of Custody (CoC): Facilitating verifiable movement from farm to processing to export, aligned with international expectations.

3. **This approach would:**

   Ensure authenticity and traceability of wood products grown outside forests.

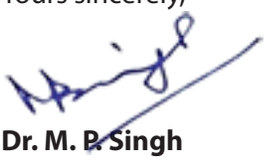
   Align well with European Union Deforestation Regulations (EUDR) and similar frameworks that emphasize legality and supply chain transparency. Encourage greater participation from rural and marginal farmers, contributing to livelihood generation and national afforestation goals.

We believe that recognizing the unique nature of ToF (Agroforetry) and tailoring certification accordingly will not only simplify implementation but also strengthen India's credibility as a responsible and competitive source of sustainably grown wood in the global market.

We remain committed to supporting the Government's vision and are happy to provide any further assistance or inputs on this matter.

Thanking you,

Yours sincerely,



Dr. M. P. Singh
Director General,
Federation of Indian Plywood and Panel Industry (FIPPI)
New Delhi

FIPPI Submits Key Recommendations to the Central Pollution Control Board (CPCB) on ECO-Mark Criteria for Wood-Based Panels

The Federation of Indian Plywood and Panel Industry (FIPPI) is pleased to submit the following interim inputs on the draft technical criteria for grant of ECO-Mark for Wood and Wood substitute products to meet the timeline given by CPCB

A. Overview comments:

1. Plywood, MDF, and Particleboard are sustainable materials made from renewable resources—primarily timber derived from agroforestry and farm forestry species. These engineered wood panels serve as substitutes for solid wood and significantly reduce reliance on non-renewable alternatives such as PVC. These engineered wood panels obtained from sustainable sources directly qualify for the ECO-Mark criteria as outlined by the Central Pollution Control Board (CPCB).
2. Unlike synthetic materials, timber is a renewable and biodegradable resource that actively contributes to carbon capture, further enhancing its environmental credentials. It has a low embodied energy and requires significantly less energy for processing compared to steel or concrete, it stores atmospheric CO_2 throughout its life cycle and helps in carbon sequestration. Moreover, it can be reused, recycled, or converted into bioenergy, making it a renewable raw material.
3. It is therefore emphasized that the criteria for ECO-Mark should be designed with due consideration of the manufacturing/production process of these materials so that all such substitutes qualify as Wood Substitutes.
4. With the growing focus on trees outside forests (TOFs) and agroforestry, the dependence of wood-based panel industry on timber from natural forests has significantly reduced to almost zero. Today, nearly 97% of the wood used by India's plywood and panel product industries comes from TOFs and rest from imported veneers or logs. By encouraging farmers to grow timber-yielding species on private and agricultural lands, agroforestry helps reduce the pressure on natural forests for wood supply. This Tree Outside Forests (TOF) approach ensures a continuous, renewable source of raw material for the timber industry while simultaneously increasing carbon sequestration, improving soil quality, and promoting biodiversity.
5. Since the raw material for these panels originates largely from agro forestry-based plantation timber, the existing traceability mechanisms employed by industries—including app-based tracking systems—are sufficient to verify sourcing. Mandating certification under the Indian Forest and Wood Certification Scheme (IFWCS), which is still under development, places an unnecessary burden on farmers and the supply chain. Hence, the focus should remain on ensuring traceability, rather than mandating certification for agroforestry timber. Moreover, the certification scheme as mentioned in the draft technical criteria falls under the categories of criteria as well compliance check methods which is not justified.
6. In accordance with global best practices, the ECO-Mark criteria should distinguish between Criteria, Indicators and Verifiers. In the context of certification frameworks, these three are defined as follows:
    1. **Criteria:** These are the fundamental principles or requirements that define what is considered "good" or "acceptable" performance within a certification framework.
    2. **Indicators:** These are specific, measurable variables that help to assess whether a criterion is being met.
    3. **Verifiers:** Verifiers are the specific data, evidence, or measurements used to assess whether an indicator is meeting the requirements

In accordance with the above definitions, the mandatory certification schemes in the draft technical criteria does not fit in the certification framework and needs to be reconsidered.

B. Specific Response-

1. Particleboard is predominantly made from wood in three forms: round wood, wood residues, and recovered wood. While round wood provides the best furnish due to controlled particle size and quality, it is costly due to equipment, processing, and drying expenses. The industry thrives on using wood residues, especially from sawmills and joinery mills, which are often already debarked, dry, and in particulate form, though offering less control over particle geometry. Wood shavings are preferred over sawdust but are costly due to competing uses, while sawdust is cheaper and improves internal bond strength but may lower other physical properties. Plywood mill veneer cores are ideal but limited in availability. Recovered wood,

both pre-consumer (e.g., production residues) and post-consumer (e.g., demolition wood, old furniture), is increasingly used to cut costs and save energy, though it presents challenges like contamination that must be managed.

2. The raw material used in MDF is also wood mainly derived from short rotation plantation wood, typically sourced from hardwood waste. Manufacturers often mix leftover lops and tops of tree and certain percentage of bamboo. To maintain quality and consistency of the final product mixing of round wood and wood residue and bamboo are kept in a fixed proportion
3. Clause wise comments for illustrations (not covering all points)

S. No.	Clause	Recommendation
1.	2.1.1. Sourcing of raw material: Demonstrate more than 80% utilization of wood residues, waste wood (from industries such as plywood, etc. and wood demolition), sawdust, recycled wood and agriculture residues (bagasse, rice husk, cotton stalk, coir fibre, rice straw etc.) and up to 20% from certified wood from agroforestry/plantation timber such as Poplar, Eucalyptus, Acacia, Bamboo, etc. for Particle board manufacturing.	The criteria currently applied for raw material sourcing in MDF/ HDF production should also be extended to Particle Board manufacturing. This would ensure consistency in environmental responsibility across similar product categories.
2.	Agro/Farm forestry be certified under the Indian Forest and Wood Certification scheme (IFWCS) of MoEF&CC or Forest Stewardship Council (FSC)/Programme for the Endorsement of Forest Certification (PEFC)/ Network for Certification and Conservation of Forests (NCCF) certification shall be taken.	The mandatory requirement for Indian Forest and Wood Certification Scheme (IFWCS) for agroforestry/plantation timber should be removed being unnecessary. This scheme is still under development and implementation, and should not be imposed as a mandatory criterion. Further this will automatically help external certification under FSC and PEFC at the cost of farmers, with no sustainability objectives being achieved in the process. Traceability mechanisms should be emphasized, to establish that these raw materials are coming from agroforestry, which is a sustainable practice under agriculture with ecological, social and economic values.
3.	2.4.1. Utilisation of waste and recycled materials Ensure maximum utilization of renewable and recycled materials across production processes as below: 1. MDF/HDF: at least 20% 2. Particle Board: at least 80% 3. Gypsum Boards/Panels: 80%	A mandatory minimum threshold of 20% usage of waste and recycled wood/Bamboo (including recovered wood and production residues) should be prescribed for particle board, similar to MDF/HDF.
4.	2.1.2. Use of Non-Hazardous Substances in place of Hazardous Substances Use of adhesives/binders/resins from natural source such as soya, lignin, starch, cardanol, etc., should be ≥ 20%. In case of biomass briquette/pellet, only natural and eco-friendly binders to be used, wherever use.	Synthetic resins do not come under this category of Hazardous substances. The provision for bio adhesives is still at experimental stage with factory trials, which cannot be integrated in the production line till detailed study is done for incorporation in BIS standards. Considering the above facts the percentage utilization of bio materials clause may be deleted based on the non-availability of the adhesives.
5.	2.2.2. Use of Natural Resources 20% reduction in total Water consumption to be achieved over a period of initial three years (Year 1: 10%; Year 2: additional 5% reduction (cumulative 15%); and Year 3: 5% (cumulative 20%). After the initial three years, reduction in total water consumption level of minimum 20% to be maintained by implementing ongoing strategies and practices after third year.	Water is very essential for resin synthesis, cooling, refining for particle board, preservative chemicals. Hence as mentioned gradual 20% reduction may be difficult. Recommend review with industry consultation including resin manufacturers and board producers, to understand current efficiency levels and challenges.

FIPPI will shortly submit to CPCB a detailed proposal and certification matrix on Wood substitutes with criteria, indicators and verifiers.❑

Exports of Plywood and Allied Products from India

B. H. Patel,
Chairman, Plywood and Allied products Panel,
CAPEXIL

Wood and Wood based Industry play a very vital role in shaping the robust growth of the Indian Economy. This industry has true potential to grow manifolds from the existing levels and is poised for sustainable growth annually. Wood based industries in India fall under following different categories, Furniture, Handicrafts, MDF, Particle Board, Plywood, Veneer, Packing Boxes, Cartons, Crates, Sawn wood and Wood planks, etc. India has a thriving range of industries for semi-processed and value-added timber products.

The wood industry in India is competitive due to the presence of a large number of small and local manufacturers in the market, accounting for a larger share in production. Wood processing is largely in the small-scale or "unorganised" sector, where the majority of wooden furniture, joinery and other household products are made to order by small workshops or individual artisans. The demand from various sectors such as housing, furniture, hospitality and handicraft remains strong. Wood panel industry is projected to benefit from the growth in the housing sector. A rapid urbanisation, high per capita disposable income and a shortening of the replacement cycle will also increase the growth in the sector. Although India is one of the world's top producers of tropical logs, it is also one of the world's largest consumers of wood products. India cannot meet its own demand for wood products with domestic supply and hence is one of the topmost importing countries of tropical woods.

Wood based MSME sector has tremendous potential for generating employment. This sector plays an important role in realizing higher economic growth in India. Many policy measures taken by the government for creating an enabling environment for industrial growth have started showing their impact on increased flow of foreign direct investment (FDI) and better performance of the infrastructure sector. Landmark initiatives – such as 'Make in India', 'Ease of Doing Business', 'Start-Up India', 'Digital India' and 'Smart Cities' – will provide further impetus to industries, and this sector is expected to be the key driver of economic growth.

Wood Products - US$ 253.33 billion Global Opportunity for Indian exporters

The Global imports of Wood products reached US$ 253.33 billion during 2024. Furniture alone accounts for US$ 99.10 billion opportunity in the word. USA, China, Japan, Germany & UK are the leading importers of wood products in the world. Currently, India's share in world exports is very negligible i.e. 1.1% for furniture and 0.4% for other wood products.

Global Imports of Wood Products in 2024

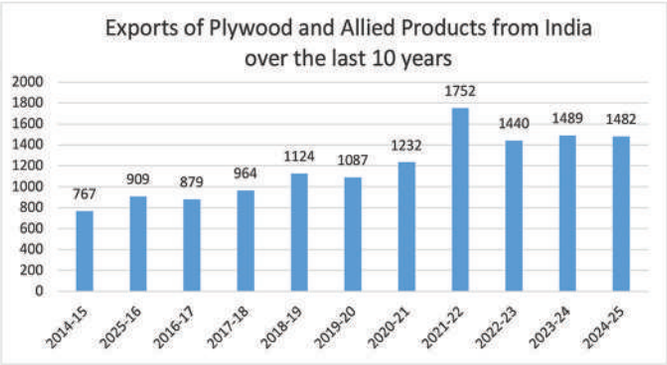
Value in US$ Billion

HS Code	Product Description	Global imports	Major importing countries	India's share in Word export (%)
44	Wood products	154.23	USA, China & Japan	0.4
9403	Wooden Furniture	99.10	USA, Germany & UK	1.1
	Total	253.33		

Source: ITC Trade Map

Exports Plywood and Allied products from India

India has a great opportunity to be among the top global manufacturers and exporters. Due to several advantages like low-cost labour, cost competitive in primary and allied sectors. India is a preferred location for top global retailers in furniture and other wood sector (IKEA, Sonoma, H&M, Otto, Target,).



Value in US $ Million

Exports of Plywood and Allied Products from India has reached US$ 1482 million during 2024-24 and showing a CAGR growth of 6.81% over the last 10 years. The major Panel products being exported from India are Wooden Furniture, Other Articles of wood, hard board of wood fibre, Electrical Insulators of any material, Plywood, Veneer and parts and accessories of musical instruments.

The major markets for Indian wood products are USA, UAE, Bhutan, UK, Netherland, Germany, France, Spain, Australia, Belgium, Italy, Nepal, Canada and Saudi Arabia.

Exports of Plywood and Allied Products from India - Item Wise

Values in USD Million

Item	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
Wooden furniture	395	431	450	533	614	630	737	987	772	810	838
Other articles of wood	234	345	312	309	370	308	335	516	387	403	380
Hard board of wood fibre	15	14	19	23	29	38	36	62	69	67	74
Electrical Insulators of Any Material	26	21	22	25	29	32	34	46	61	71	69
Other plywood & products	29	41	27	33	32	34	37	71	75	57	52
Veneer	15	14	15	16	23	22	25	33	38	44	31
Parts & Accessories of Musical Instruments	15	13	13	14	18	16	18	24	23	25	25
Sawn timber	31	25	18	8	5	3	4	7	8	7	9
Cork and cork products	2	2	2	3	4	3	4	5	5	5	5
Sandalwood chips	4	2	2	1	1	1	1	1	2	0	0
Total	767	909	879	964	1125	1087	1231	1752	1440	1489	1482

Source: DGCIS.

Top 10 HS Codes Exported from India (8 Digit HS Code wise)

Values in USD Million

H S Code	ITC HS Description	2022-23	2023-24	% Change
94036000	Wooden Furniture	667.37	688.69	3.19
44219990	Articles of Wood	185.58	189.34	2.03
85469090	Electrical Insulator of Other Materials	61.08	71.04	16.31
44199090	Articles of Wood	58.38	53.37	-8.58
94033010	Cabinet ware	43.64	48.01	10.01
44039918	Red Sanders	4.27	37.59	780.33
94039900	Other Articles of Wood	24.8	26.13	5.36
44111400	OF A THICKNESS EXCEEDING 9MM	31.57	25.92	-17.90
44123190	Articles of Wood	30.88	25.18	-18.46
44123990	PLASTIC LAMINATED PLYWOOD	16.21	23.12	42.63

Global Wooden Furniture industry - US$ 99.10 billion opportunity

Global imports of Wooden Furniture have reached USD 99.10 billion in 2024. The leading importers of Wooden Furniture globally are USA, Germany, UK, France, Netherlands, Canada, Japan, Switzerland, Australia and Spain.

Global imports of Wooden Furniture (9403) in 2024

Importers	Value imported in 2024 (USD thousand)	Quantity imported in 2024	Quantity Unit	Unit value (USD/unit)	Share in world imports (%)
World	99105378	NA	No quantity		100
USA	28962861	NA	No quantity		29.2
Germany	7114845	2449133	Tons	2905	7.2
UK	5462764	1590714	Tons	3434	5.5
France	5155581	1476850	Tons	3491	5.2
Netherlands	3380972	889377	Tons	3802	3.4
Canada	3098852	NA	No quantity		3.1
Japan	2593823	887127	Tons	2924	2.6
Switzerland	2368139	362593	Tons	6531	2.4
Australia	1980164	NA	No quantity		2
Spain	1815936	NA	No quantity		1.8
Italy	1811170	637527	Tons	2841	1.8
Belgium	1802881	566546	Tons	3182	1.8
Austria	1637902	323640	Tons	5061	1.7
Poland	1617636	592548	Tons	2730	1.6
UAE	1366988	NA	No quantity		1.4

Source: ITC Trade map

Furniture exports from India

An export of Wooden Furniture from India has reached US$ 838 million during 2024-25 and showing an increase of 3.45% compared to corresponding period last year. The major markets for Indian Wooden Furniture are USA, Netherland, Germany, UK, France, Spain, UAE, Canada, Australia and Saudi Arabia.

Exports of Wooden Furniture (9403) from India

Value in US$ Million

Country	Apr-Mar'24	Apr-Mar'25	% Change
U S A	561.95	568.34	1.14
NETHERLAND	106.28	99.93	-5.97
GERMANY	83.75	91.42	9.15
U K	58.05	58.71	1.14
FRANCE	58.14	54.31	-6.59
SPAIN	41.69	46.26	10.96
UAE	33.94	36.41	7.30
CANADA	35.06	31.67	-9.67
AUSTRALIA	30.98	29.86	-3.62
SAUDI ARABIA	22.49	27.13	20.66
BELGIUM	17.46	20.10	15.13
ITALY	11.51	10.77	-6.36
VIETNAM	1.96	7.70	292.58
POLAND	5.57	7.06	26.84
SOUTH AFRICA	4.58	6.48	41.42

Source: DGCIS

The Indian wooden furniture market has enormous opportunities for manufacturers to innovate and deal with growing demand in the wood furniture market. Local manufactures are partnering with foreign manufacturers to improve their quality and designs in the market. The need for modular furniture provides immense opportunities for wooden furniture and hardware owners in the market. Furniture manufacturers are considering several factors while designing furniture, such as the furniture's functionality, look, feel, and value while designing furniture.

Exports of Other Articles of wood

India exported US$ 380 million worth of "Other articles of wood" during 2024-25 under HS Codes 4412, 4419, 4421 & 9403. These are intermediate products used in furniture, flooring and decking products.

Other major wood products are being exported from India are Hard Board of wood fibre (US$ 74 Million), Electrical insulators of any material (US$ 69 million) and Plywood (US$ 52 million).

Quality Control Orders (QCOs)

The Government of India has been working in mission mode to develop a robust quality ecosystem in India, the hallmark being the accent on superior and safety compliant products to take the economy to higher echelons of growth and development. As part of this endeavour, Quality Control Orders (QCOs) are being rapidly introduced by the Department for Promotion of Industry and Internal Trade (DPIIT) for wood-based panels. Currently there are two Quality Control Orders issued for Wood Based panels as listed below and wood industry has welcomed the QCOs issued on finished product i.e. Wooden Flush Doors.

a. Wood Based Boards (Quality Control) order 2024 with effective from 11th February 2025.

b. Plywood and Wooden Flush Doors (Quality Control Order) 2024 with effective from 28th February 2025.

Challenges faced by Indian Wood based Industries

1. Raw material shortage: India is a wood log deficient country and inadequate raw material availability domestically is a major constraint for the Indian wood Industry. Access to superior quality raw materials at competitive costs poses a big challenge for the wood industry in India and often leads to wood shortages just when exports are growing. The customers demand high quality products at higher rate for which the manufacturers/exporters need to procure best quality of raw material to ensure quality specification & to meet customers' expectation. India imported US$ 1.04 billion worth of wood logs & US$ 522.67 million worth of Sawn timber into India during 2024-25.

Imports carry their own risk & hassles in handling cargo & documents. There are very few countries in the world which have surplus timber resources for export. The surplus countries too are planning to export value-added products. Hence getting the raw materials for the industries is becoming difficult day by day. Since the availability of the raw materials is a big challenge in domestic as well as in international markets, the industry has started shifting to the countries where there is ample supply of the basic raw materials i.e. wood logs. The lots of investment have taken place in the countries like Myanmar, Cambodia, Vietnam and Gabon and the exports have been shifted from the these countries.

Imports of Wood Log (4403) into India

Value in US$ Million

Country	Apr-Mar2024	Apr-Mar2025	%Growth
AUSTRALIA	92.05	158.70	72.40
URUGUAY	113.71	115.36	1.45
MALAYSIA	136.45	109.43	-19.80
ECUADOR	73.12	84.51	15.58
BRAZIL	63.67	83.90	31.77
NEW ZEALAND	6.68	74.43	1,014.87
ARGENTINA	75.69	70.11	-7.38
U S A	53.59	54.50	1.70
PANAMA REPUBLIC	38.83	38.29	-1.39
GHANA	45.18	37.01	-18.08
SURINAME	18.06	28.35	56.98
COSTA RICA	19.68	25.31	28.64
PAPUA N GNA	26.79	21.71	-18.99
SOUTH AFRICA	13.09	21.24	62.21
SINGAPORE	16.83	16.21	-3.69

Source: DGCIS

IMPORTS OF SAWN TIMBER (4407) INTO INDIA DURING 2024-25

Value in US$ Million

Country	Apr-Mar'24	Apr-Mar'25	% Change
GERMANY	96.25	96.57	0.33
INDONESIA	28.40	29.72	4.64
BRAZIL	25.46	27.81	9.24
MALAYSIA	29.68	26.81	-9.68
U S A	25.80	26.09	1.10
U K	17.60	25.50	44.90
TOGO	19.12	24.60	28.67
SWEDEN	17.95	22.22	23.80
ECUADOR	14.48	21.22	46.51
AUSTRIA	14.84	19.16	29.17
COTE D' IVOIRE	12.58	17.46	38.81
BENIN	20.16	15.68	-22.21
RUSSIA	5.33	15.11	183.29
TANZANIA REP	12.96	14.37	10.93
PAPUA N GNA	9.13	11.23	23.02

Source: DGCIS.

2. Indian wood-based sector is largely unorganised. There are issues like raw material competitiveness, scale of operation and in-efficient logistics Products are rather poorly designed with average finishing and aesthetics, high per unit cost, low productivity and low product volumes and based on a single plant assembly model.
3. There is a demand-supply & quality gap viz-a-viz goods for Indian consumption and goods of export quality, which needs to be bridged. This requires prior addressing of quality and cost effectiveness issue to compete in the global market.
4. Our import conditions for wood-based sector are liberal and rather deficient in technical regulations. There are no regulations applicable to most wood/wood-based products except for sanitary and phytosanitary measures.
5. Lack of skilled manpower and machinery in India

Recommendations to promote wood-based industries:

- Focusing on planning and forecasting sector specific future wood demand. Developing/scaling up multiple raw material sources: forests, trees outside forests (agroforestry, urban forestry, linear plantations, woodlots etc.) and imports.
- We need to have a uniform wood import policy with necessary technical regulations. We should aim to substitute imports with domestic alternatives as far as possible, over a period of time.
- Developing PPP and other business models, with farmers, industry, forest departments, etc. and incentivising farmers and tree growers for growing trees. Enhancing wood production by adopting cluster based and industry linked agroforestry plantations.
- Encourage voluntary certification of wood coming from forests/trees outside forests. Incentivize certification of wood coming from trees outside forest to ensure better markets and price premium to farmers and augment availability of certified raw materials to the industries. This will also contribute towards doubling farmers income.
- **Reduction of value addition in Sawn Timber (HS Code 4407) exports should be reduced from 30% to 15% in line with Advance Authorisation Scheme/DEEC Scheme:** Value addition in respect of Sawn Timber exports should be reduced from 30% to 15% in line with Advance Authorisation Scheme/DEEC Scheme. This 30% VA was fixed in 1993, when the DEEC scheme carried the VA @ 30%. Now at present the DEEC or say AA scheme carries VA @ 15%. Therefore, the VA in case of Sawn timber also needs to be revised to 15% at par with the AA scheme. Further, the exporters are not able to import Sawn timber as achieving 30%VA is difficult and this causes the diversion of business to compete countries like Singapore or China. Though these countries do not grow the logs but still compete with India in global market as these countries do not have such restrictions. To face this competition strongly, the Value addition needs to be 10 to 15% maximum. This will surely increase the export volume for the country. Industry is mainly located in the rural areas & has been providing the much-needed employment to skilled & semi-skilled persons in rural & semi urban areas. With the increase in the export, the level of the employment generation will go up.
- **Re-export of the imported sawn timbers:** Re-export of the imported sawn timbers should be allowed freely. More and more countries globally are resorting to export of value-added products. If this facility is not allowed, it will not be possible to get the quality raw logs for the export productions. To maintain the continuity of the export & to maintain the continuous export with the existing buyers, imported Sawn timbers should be allowed to be freely exported (in case they can't be used for manufacture of value-added products). The sawn timbers at present are allowed to be imported freely.
- Help farmers, industry, forest departments with insurance for trees, wood and other forest produce at par with insurance for agriculture commodities.
- Scaling up the capacity and infrastructure, re-modelling the domestic furniture business on the concept of aggregation model and developing infrastructure of Furniture Marts in different parts of India to help in maximising their capacity.
- Potential Wood based MSME clusters need to be identified & scaled up as per market demands and raw materials availability.
- Development of uniform technical regulations using appropriate standards across the manufacturing units for sourcing and quality of products manufactured, whether for import or for domestic markets.
- Attract leading global players to India for investment in production equipment, raw materials, training and in developing best practices.
- There is dearth of skilled labour. Need for prioritisation of industry related skill and trainings, capability building programs and workshops. Supporting traditional knowledge, local skills and values on wood, plantation and supply chain.❑

Plywood and Panel Imports in the Post Quality Control Orders (QCOs) Era

Rishabh Gandhi
Economic Officer
Federation of Indian Plywood & Panel Industry (FIPPI)

1. Overview

1.1 India's Plywood and Panel Import Landscape

Over the past decade, the Indian wood-based industry has firmly established itself as a vital pillar of the country's economic framework, underpinning sectors such as construction and real estate. This industry encompasses a wide array of activities, including logging, sawmilling, manufacturing of wood panels and the production of finished goods like furniture.

In the context of India's Plywood and Panel Industry, global trade is not merely a support function – it forms the foundation of the industry's structure. The growing demand for wood panels – driven by the government push for real estate development and its ambition to position India as a global furniture manufacturing and export hub – has outpaced the sector's ability to ramp up production capacity quickly. As a result, a significant share of domestic needs continues to be met through imports.

India imported wood panel (plywood, MDF and particle board combined) worth INR 3,431 crore in FY 2024 – 25, reflecting a strong compound annual growth rate (CAGR) of approximately 14.6% over the past five years. Notably, plywood accounted for nearly 73% of these imports, highlighting a significant gap between domestic production and the country's growing demand for plywood.

1.2 Implementation of the Quality Control Orders (QCOs)

In the recent years, a significant portion of India's wood panel imports has been characterized by substandard products, often dumped at significantly lower prices by foreign manufacturers. This influx has placed the domestic manufacturers at a severe disadvantage and posed safety risks to end consumers using finished products made from such inferior materials.

To address these concerns – ensuring consumer protection and creating a level playing field for domestic manufacturers – the Government of India introduced the Quality Control Orders (QCOs) for plywood and other wood-based boards, effective from February 2025. Specifically, the 'Plywood and Wooden flush door shutters (Quality Control) Order, 2024' came into effect on 28th February 2025 and the 'Wood Based Boards (Quality Control) Order, 2024' became effective on 11th February 2025.

Regarding imports, following the implementation of the QCOs, only plywood and panel products from manufacturers with valid Bureau of Indian Standards (BIS) licenses are permitted to be exported to India.

1.3 Objective and Scope of the Study

The primary objective of this study is to examine the effectiveness of the recently introduced QCOs. Specifically, it aims to determine whether plywood and panel products entering India after the implementation of the QCOs originate exclusively from manufacturers holding BIS licenses. To analyse the post QCOs scenario, the study considers import data from the three-month period following the enforcement of the QCOs – March, April and May 2025.

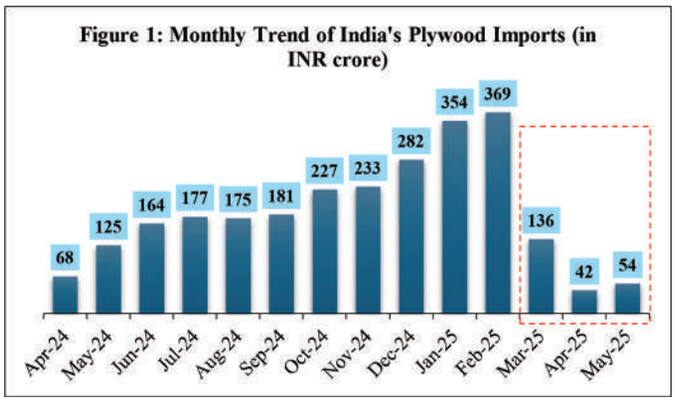
Additionally, the study aims to identify specific patterns related to non-compliance, including the top source countries involved, major Indian ports receiving such shipments and key foreign manufacturers associated with non-compliant imports.

Sources: Trade Portal, Department of Commerce, Ministry of Commerce and Industry; BIS Licensee Database.

Plywood

2. Analysis of Plywood Imports Following the Implementation of the QCOs

2.1 Monthly Trends in Plywood Imports to India



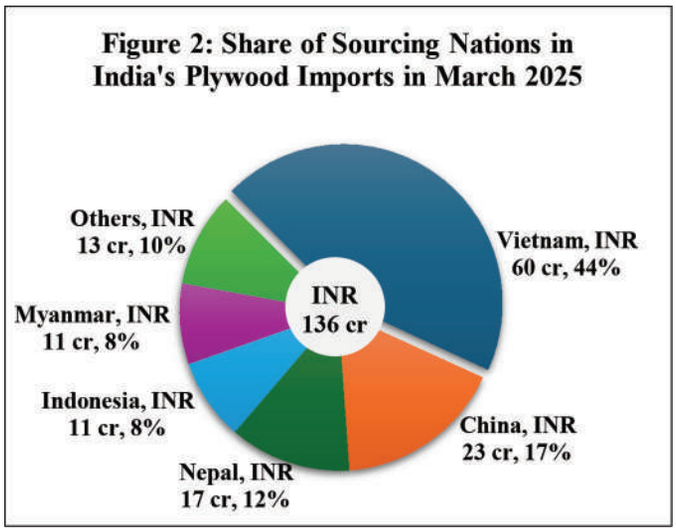
The month-wise trend analysis of India's plywood imports during FY 2024-25 (as shown in Figure 1) reveals some noteworthy patterns. At the beginning of the financial year, India imported plywood worth INR 68 crore in April 2024, which surged more than five-fold to INR 369 crore by February 2025, just before the implementation of the QCOs. This sharp rise in imports can be attributed to two key factors – first, a surge in shipments containing substandard products, particularly from China; and second, large-scale stockpiling by Indian importers ahead of the QCOs enforcement deadline.

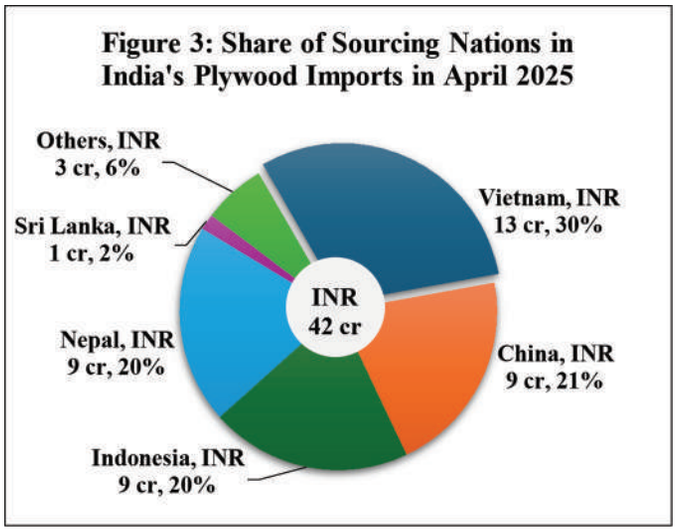
Following the implementation of the QCOs, India's plywood imports stood at a reduced level of INR 136 crore in March, which further dropped to INR 42 crore and INR 54 crore in April and May 2025, respectively. At first glance, the decline in import figures suggests that the QCOs are effectively restricting the entry of plywood products into India that originate from foreign manufacturers without BIS licenses. However, considering that very few foreign manufacturers have been granted BIS licenses so far, these import volumes still appear relatively high, indicating that some non-BIS-compliant products may continue to enter India even after the enforcement of the QCOs.

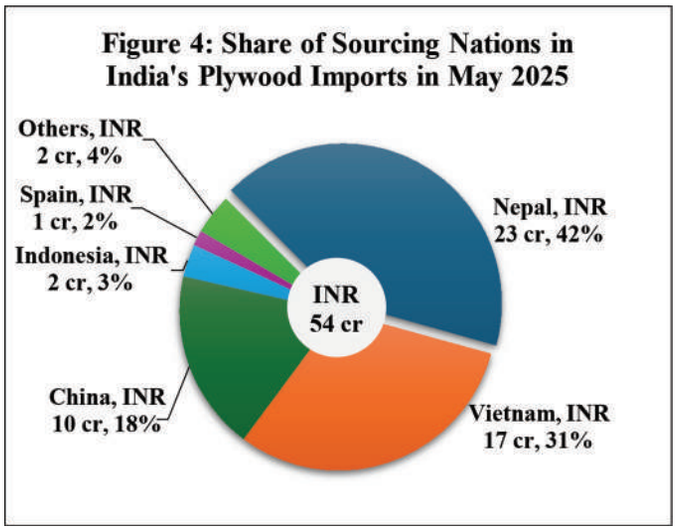
2.2 Major Source Countries for India's Plywood Imports in the Post QCOs Era

The source-country distributions of India's plywood imports for March, April and May 2025 are presented in Figures 2, 3 and 4.

In March 2025, Vietnam emerged as the top source country for India's plywood imports, accounting for a substantial 44% share of total shipments, valued at INR 60 crore. It was followed by China and Nepal, with 17% and 12% shares of total imports, respectively. Vietnam







maintained its leading position in April 2025, exporting plywood worth INR 13 crore to India (30% share), followed by China and Indonesia, which held 21% and 20% shares, respectively. A shift in trend was observed in May 2025, with Nepal becoming the top-source country, supplying plywood worth INR 23 crore (42% share). It was followed by Vietnam and China, with 31% and 18% shares, respectively.

This source-country distribution indicates that, consistent with trends observed in FY 2024-25, India's plywood imports in the post QCOs period remain concentrated among three key source countries – Vietnam, China and Nepal.

2.2.1 Analysis of India's Plywood Imports Sourced from Vietnam Post QCOs

Figure 5: Monthly Trend of Plywood Imports from Vietnam Post QCOs (in INR crore)

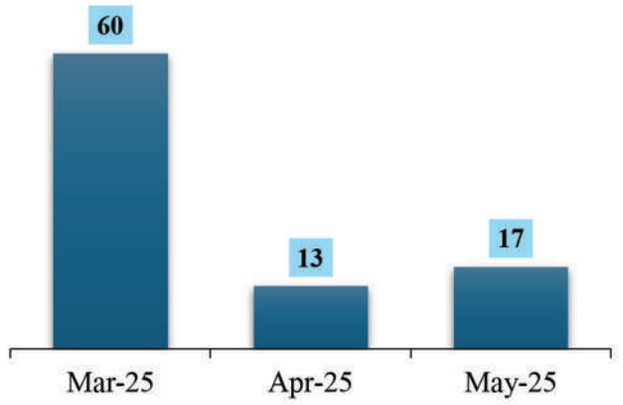
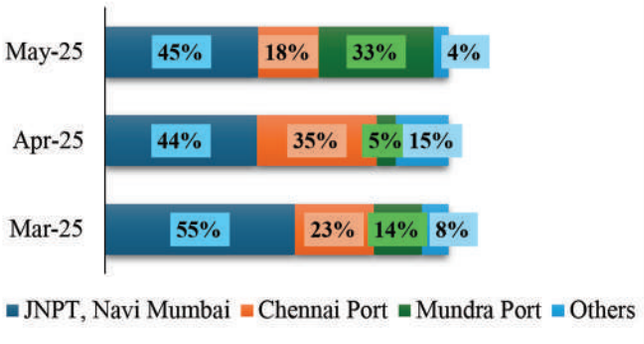


Figure 6: Arrival-Port wise Distribution of Plywood Imports from Vietnam Post QCOs

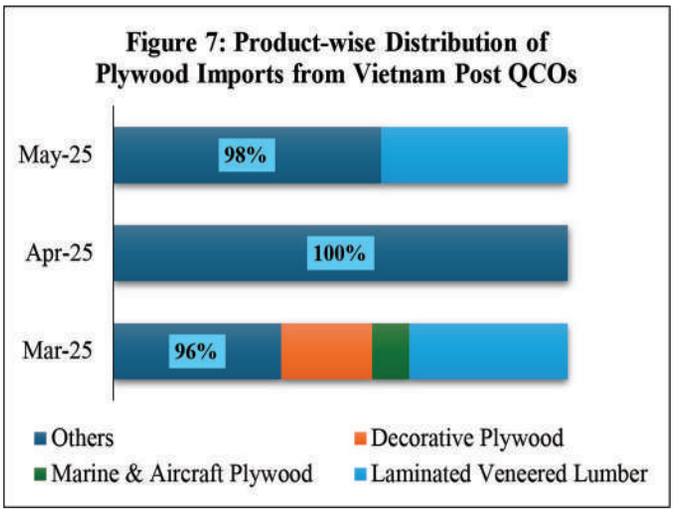


The monthly trend and arrival-port-wise distribution of plywood imports from Vietnam following the implementation of the QCOs are shown in Figures 5 and 6. India imported plywood worth INR 60 crore from Vietnam in March, which declined to INR 13 crore in April and INR 17 crore in May 2025. While plywood imports from Vietnam dropped siginificantly in the post QCOs period, what's more notable is that no Vietnamese manufacturer has been issued a BIS license for any plywood category.

The arrival-port-wise distribution of plywood imports from Vietnam during the post QCOs period shows that Jawaharlal Nehru Port (Nhava Sheva) in Navi Mumbai emerged as the largest entry point, handling nearly half of the total shipments. Specifically, the port accounted for 55%, 44% and 45% of total plywood volumes arriving from Vietnam in March, April and May 2025, respectively. It was followed by Chennai and Mundra ports, which also became siginificant entry points for Vietnamese plywood after the implementation of the QCOs.

Further, the product-wise distribution of plywood imports from Vietnam after the implementation of the QCOs (as shown in Figure 7) reveals some surprising patterns. Most plywood products entering the Indian market have been classified under the 'Others' sub-category of HSN Code 4412. Specifically, 96% of imports in March, 100% in April and 98% in May were classified under this sub-category when exported to India.

Figure 7: Product-wise Distribution of Plywood Imports from Vietnam Post QCOs



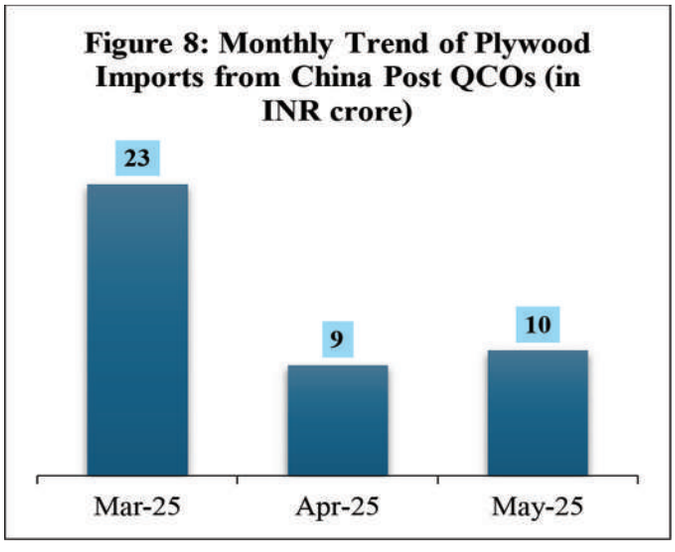
The following table lists Vietnam-based companies without BIS licenses whose consignments were cleared at Indian ports after the implementation of the QCOs.

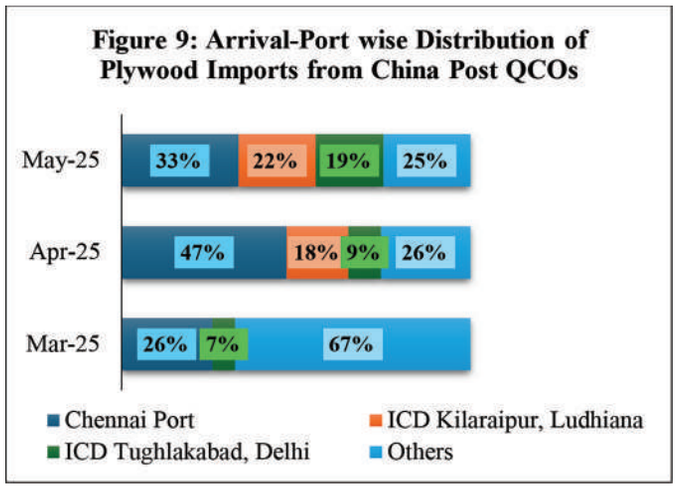
The above analysis highlights that despite no plywood manufacturer from Vietnam being issued a BIS license for any category of plywood, Vietnam has emerged as the top source of India's plywood imports following the implementation of the QCOs. A significant portion of these non-compliant imports are entering the Indian market through Jawaharlal Nehru Port in Navi Mumbai, followed by Chennai and Mundra ports. Furthermore, almost all such imports have been classified under the 'Others' sub-category of HSN Code 4412, suggesting that this catgeory is being widely misinterpreted at Indian entry points as exempt from mandatory BIS certification.

Table 1: List of Vietnam-Based Companies Exporting Plywood to India Without BIS Licenses (Post QCOs Implementation).			
1. 368 Plywood Import Export Joint Stock Co.	2. Agritek Co., Ltd	3. Alphawood Co., Ltd	4. AMC Vietnam Co., Ltd
5. An Lam Co., Ltd	6. Asean General Woods Import Export	7. Asia Vietnam Plywood Co., Ltd	8. Asian Arowana Import Export Ltd
9. Baifar Langson Co., Ltd	10. Bao Yen MDF Joint Stock Co.	11. Benchmark Industries Co., Ltd	12. Bright Vina Plywood Co., Ltd
13. Công Ty TNHH Plywood C & C	14. Cuong Linh Wood Joint Stock Co.	15. D&C Vietnam International Wood Co.	16. Dung Hang Trading & Manufacturing
17. Fomex Global Joint Stock Co.	18. H&G Import Export Co., Ltd	19. Hai Phu One Member Co., Ltd	20. Hoang Lam Plywood Joint Stock Co
21. Home Products Source Ltd	22. HPC Holding Co., Ltd	23. Hung Chang Phu Tho Trading	24. Hung Dung Hth Production & Trading
25. Hung Hang Phu Tho One Member LLP	26. Huongson Wood Group Co., Ltd	27. Innovation Pacific Singapore Pte Ltd	28. Kego Co., Ltd
29. LIM Company	30. Longdat Import-Export and Production	31. Newwood Joint Stock Co.	32. Son Hung Joint Stock Co.
33. Tekhub Vietnam Joint Stock Co.	34. Thuan Phat Industrial Wood	35. Tmv Plywood Viet Nam Co., Ltd	36. Trieu Thai Son Co., Ltd Truc Mai Phu Tho
37. TT Plywood Import Export & Trading	38. Upply Minh Phuc Trading	39. Vietsun 19 Co., Ltd	40. Vinacamon Joint Stock Co.
41. Western Star Import and Export Co., Ltd	42. Wood Alliance Investment	43. Wood Line Co., Ltd	44. Zhong Sheng Wood Co., Ltd

2.2.2 Analysis of India's Plywood Imports Sourced from China Post QCOs

Figures 8 and 9 illustrate the monthly trend and arrival-port-wise distribution of plywood imports from China following the implementation of the QCOs. Consistent with the pattern observed in imports from Vietnam, plywood imports from China also declined in April and May 2025 relative to March. In March 2025, India imported plywood worth INR 23 crore from China, which declined substantially to INR 9 crore in April and INR 10 crore in May 2025. Notably, there are no manufacturers from either Vietnam or China that have been issued BIS licenses for any catgegory of plywood. Despite this, the continued clearance of consignments originating from China raises serious concerns regarding regulatory enforcement and adherence to the mandatory certification requirements.





The arrival-port-wise distribution of plywood imports from China following the implementation of the QCOs indicates that a substantial share of these shipments was handled by Chennai Port, establishing it as the primary entry point for Chinese plywood. Specifically, Chennai Port managed 26%, 47% and 33% of the total shipments from China in March, April and May 2025, respectively. In April and May 2025, Chennai Port was followed by Inland Container Depot (ICD) Kilaraipur, Ludhiana and ICD Tughlakabad, Delhi, both of which handled notable volumes of plywood imports from China.

The product-wise distribution of plywood imports from China (as shown in Figure 10) reveals trends similar to those observed in the case of Vietnam. A majority of these imports have been classified under the 'Others' sub-category of HSN code 4412. The share of this sub-catgeory in total plywood imports from China increased steadily

Figure 10: Product-wise Distribution of Plywood Imports from China Post QCOs

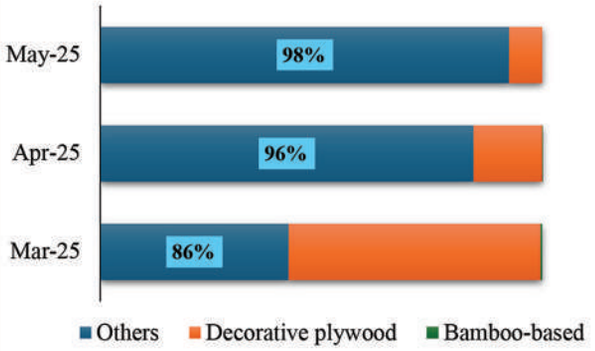


Table 2: List of China-Based Companies Exporting Plywood to India Without BIS Licenses (Post QCOs Implementation).

1. Accahome Ltd	2. Beijing Graphic International Trade	3. Dalian Amuer Co., Ltd	4. Dalian Jiaen Meike Wood Industry Co., Ltd
5. Dalian Maishun Wood Industry Co., Ltd	6. Durafloor Werner Gmbh	7. Gold Seagull Shanghai Flooring Company	8. Hang Sam International Co., Ltd
9. Hangzhou Zen Bamboo & Hardwood Products	10. Heze Ruidu International Trade	11. Htl Import Export Trading Kunshan Co., Ltd	12. Huzhou Jonhos Creative Home Co., Ltd
13. Huzhou Shito Homie Co., Ltd	14. Huzhou Teya Floor Co., Ltd	15. Huzhou Weiya Trading Co., Ltd	16. Infinite Grace Co., Ltd
17. Jesonwoood Forest Products (zj) Co., Ltd	18. Jiaxing Frank International Co., Ltd	19. Jining Floormaker Co., Ltd	20. Langfang Lanxing Impex Co., Ltd
21. Lianyungang Chanta International Wood	22. Lianyungang Yuantai International Trade	23. Linsen Railway Vehicle Components Co., Ltd	24. Linyi Bait Wood Industry Co., Ltd
25. Linyi Chunchang International Trade	26. Linyi Consmos Wood Industry Co., Ltd	27. Linyi Haishun Import and Export Co., Ltd	28. Linyi Heyuanming International Trading
29. Linyi Huanhai International Trade	30. Linyi Huifu International Trade	31. Linyi Jingxinda International Trade	32. Linyi Leberg International Trade
33. Linyi Powerade Wood Co., Ltd	34. Linyi Rongchen Import & Export Co., Ltd	35. Linyi United International Trading	36. Linyi Weihang International Trade
37. Linyi Wells Import & Export Co., Ltd	38. Linyi Xingtan Building Materials Co., Ltd	39. Max Choice Wood Industry Co., Ltd	40. Shandong Changsen Import & Export Co., Ltd
41. Shandong Kaiyuan Wood Industry Co., Ltd	42. Shandong King Kong Industry Co., Ltd	43. Shandong Ruitai Import & Export Trade	44. Shandong Suraj International
45. Shandong Yimai International Trade	46. Shanghai Glorious International Co., Ltd	47. Suqian Sulu Import & Export Trading Co., Ltd	48. Weifang Suntop Import & Export Co., Ltd
49. Win Top Enterprises Ltd	50. Xuzhou Emmet Import & Export Trading	51. Xuzhou Huanghuai Co., Ltd	52. Xuzhou Shenghe Wood Co., Ltd
53. Yalong New Material Shandong Co., Ltd	54. Yiyuan Great Hawk Wood Co., Ltd	55. Zhaoqing Yaodonghua Decor Materials	56. Zhejiang Guolian Floor Co., Ltd

month-over-month, reaching 98% in May 2025, up from 86% in March and 96% in April. This persistent reliance on the 'Others' sub-category raises concerns about potential misclassification and circumvention of mandatory BIS certification requirements.

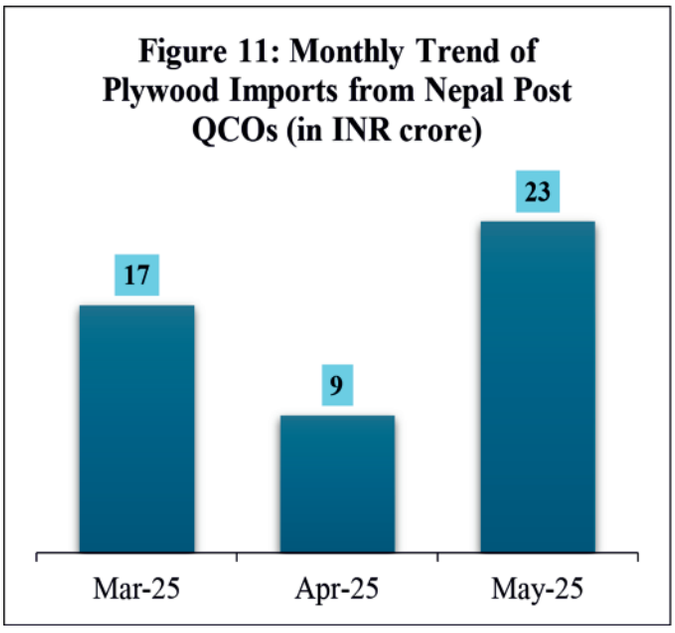
The following table provides a list of China-based companies that have not been issued BIS licenses, yet whose consignments were cleared at Indian ports after the implementation of the QCOs.

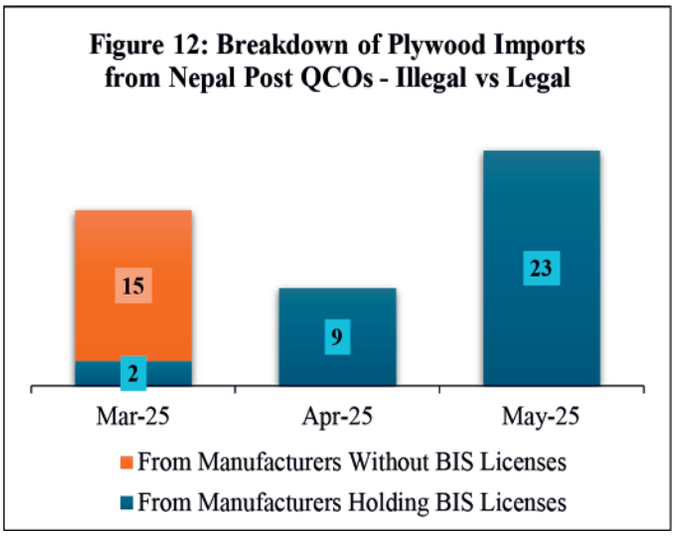
The above analysis of plywood imports from China following the implementation of the QCOs reveals that, despite no Chinese plywood manufacturer having been issued a BIS license for any category of plywood, China emerged as the second-highest source of India's plywood imports – second only to Vietnam. A substantial portion of these consignments has entered the Indian market through Chennai Port, followed by ICD Kilaraipur (Ludhiana) and ICD Tughlakabad (Delhi). Consistent with the trend observed in the case of Vietnam, nearly all plywood imports from China have been classified under the 'Others' sub-category of HSN Code 4412. This pattern strongly suggests that exporters may be misuing this sub-catgeory to circumvent mandatory BIS certification and facilitate the entry of non-compliant plywood into the Indian market.

2.2.3 Analysis of India's Plywood Imports Sourced from Nepal Post QCOs

The monthy trend of total plywood imports from Nepal, along with their classification into legal and illegal segments, is presented in Figures 11 and 12. Illegal imports are defined as those originating from manufacturers that do not hold BIS licenses, while legal imports refer to consignments from BIS-certified manufacturers, following the implementation of the QCOs.

After the QCOs came into effect, plywood imports from Nepal stood at INR 17 crore in March, declined to INR 9 crore in April and then rose sharply to INR 23 crore in May 2025. A detailed breakdown reveals that in March, of the total import value of INR 17 crore, INR 15 crore worth of consignments originated from 30 manufacturers lacking BIS certification. However, in April and May, imports from non-BIS-certified manufacturers ceased entirely and all consignments were sourced from just 9 BIS-certified manufacturers.





The sharp rise in export value from the same set of 9 BIS-certified manufacturers – from INR 2 crore in March to INR 23 crore in May 2025 – raises significant concerns.

The following tables separately list Nepalese plywood manufacturers who have been granted BIS licenses and those who have not.

Table 3: List of Nepalese Plywood Manufacturers Holding BIS Licenses.

1. Ambey Bhawani Ply Board Udhyog Pvt. Ltd.	2. Bhusal Ply & Bamboo Industries	3. Century Ply Industries Pvt. Ltd.	4. Everest Veneers Pvt. Ltd.
5. Ganpati Veneer Tatha Plywood Udhyog	6. Greenply Industries Nepal Pvt. Ltd.	7. Jhapa Veneer & Plywood Udhyog	8. Sawariya Plywood Pvt. Ltd.
9. Shyam Plywood Industries Pvt. Ltd.			

Table 4: List of Nepalese Plywood Manufacturers Who Exported Plywood to India Without BIS Licenses in March 2025.			
1. Annapurna Plywood Udhyog	2. Apurva Ply Industry Pvt. Ltd	3. Asian Plywood Industries Pvt. Ltd	4. Bhagwati Laminates Pvt. Ltd
5. Himshikhar Laminate & Kastha	6. Jaya Bajaranga Plywood Industries	7. Jaya Maa Kamakhya Industries Pvt. Ltd	8. Kankai Plywood Industries
9. Kohinoor Plywood Industries Pvt. Ltd	10. Mata Pathivara Plywood Industry	11. Namaste Plywood Industries Pvt. Ltd	12. Nepal Veneer Udhyog
13. Om Wood Products Pvt. Ltd	14. Pashupati Plyboard Udhyog Pvt. Ltd	15. Pathivara Veneer & Plywood Industries	16. Riddhi Siddhi Plywood Industries
17. Sanjibani Plywood Udhyog Pvt. Ltd	18. Sarawagi Plywood Industries	19. Shakambhari Plywood Industries	20. Shiva Shakti Wood Pyanal Industries
21. Shree Jagdamba Plyboard Industries	22. Shree Ply Industries Pvt. Ltd	23. Siddhartha Plywood Industries Pvt. Ltd	24. Siddhi Binayak Plywood Industries
25. Sriram Panel Product Pvt. Ltd	26. Sungreen Plywood Industries Pvt. Ltd	27. Sunsari Veneers Pvt. Ltd	28. Surya Tea Chest Industries
29. Tirupati Wood Panel Industries	30. Venkatesh Wood Panel Industries		

Table 5: Monthly Plywood Export Volumes (in thousands of square meters) from BIS-Certified Nepalese Manufacturers to India (Jan – May 2025).

BIS-Certified Nepalese Manufacturers	Jan – Feb 2025	March 2025	April 2025	Jan-Apr Combined	May 2025	May Exports Compared to Jan-Apr Average (in Multiples)
Ambey Bhawani Ply Board Udhyog	48	56	44	148	131	4 times
Bhusal Ply & Bamboo Industries	13	0	115	128	70	2 times
Century Ply Industries Pvt. Ltd.	9	10	64	83	69	3 times
Everest Veneers Pvt. Ltd.	13	8	21	42	35	3 times
Ganpati Veneer Tatha Plywood Udhyog	19	0	0	19	204	43 times
Greenply Industries Nepal Pvt. Ltd.	37	5	31	73	46	2 times
Jhapa Veneer & Plywood Udhyog	25	13	77	114	386	14 times
Sawariya Plywood Pvt. Ltd.	20	23	66	109	148	5 times
Shyam Plywood Industries Pvt. Ltd.	37	3	51	91	122	5 times.

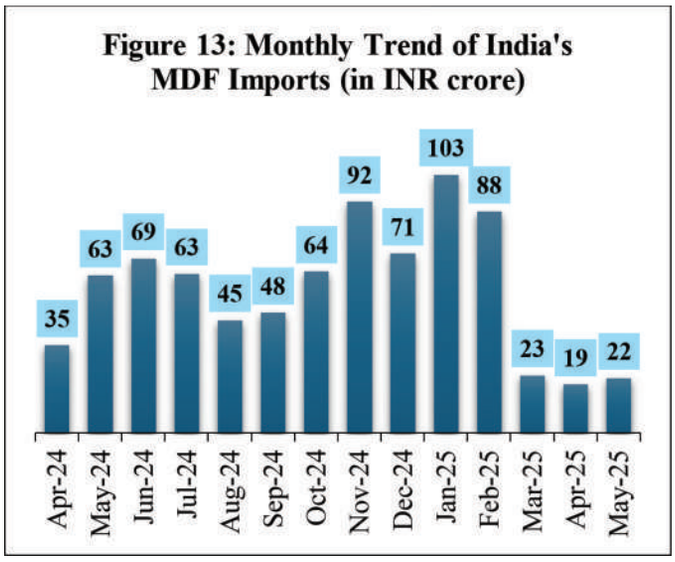
Exporter-wise import data of May 2025 from Nepal to India show an abnormal surge in plywood volumes exported by BIS-certified plywood manufacturers from Nepal. Most of these manufacturers recorded a multi-fold increase in their export figures to India in May, compared to the trend observed during the January to April 2025 period. The following table presents the monthly plywood export volumes (in thousands of square meters) from Nepalese manufacturers holding valid BIS licenses.

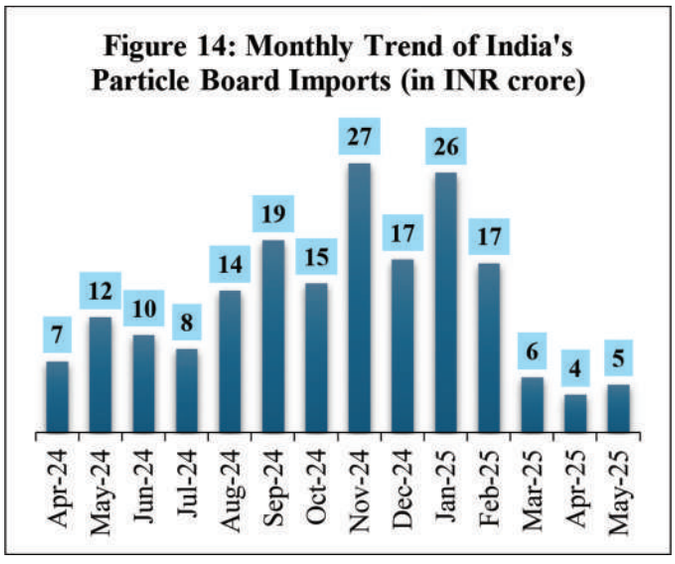
The above analysis highlights that despite the implementation of the QCOs in February 2025, most of the plywood imports from Nepal in March 2025 originated from manufacturers lacking BIS licenses. Furthermore, the abnormal surge in exports from Nepal-based manufacturers holding BIS licenses in May 2025 indicates a strong possibility that non-BIS-compliant plywood from Nepal is entering India under the cover of certified material. It appears that manufacturers holding BIS licenses are misusing their licenses to facilitate the entry of illegal plywood of non-BIS manufacturers into India, thereby undermining the primary objective of the QCOs.

MDF & Particle Board

3. Analysis of MDF & Particle Board Imports Following the Implementation of the QCOs

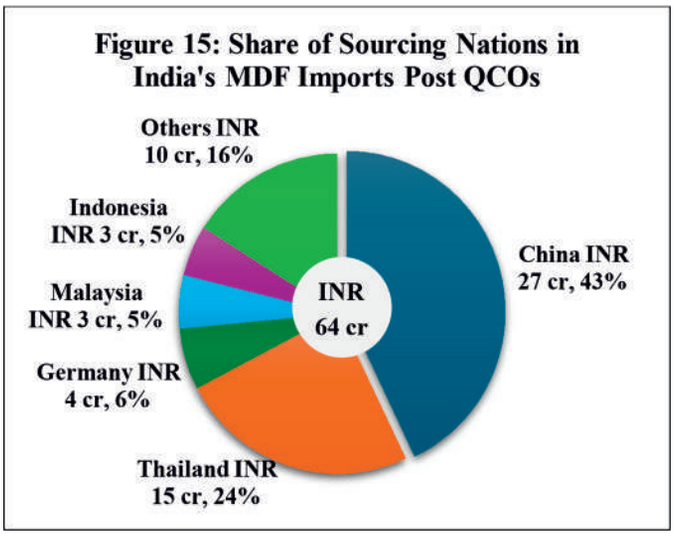
3.1 Monthly Trends in MDF & Particle Board Imports to India

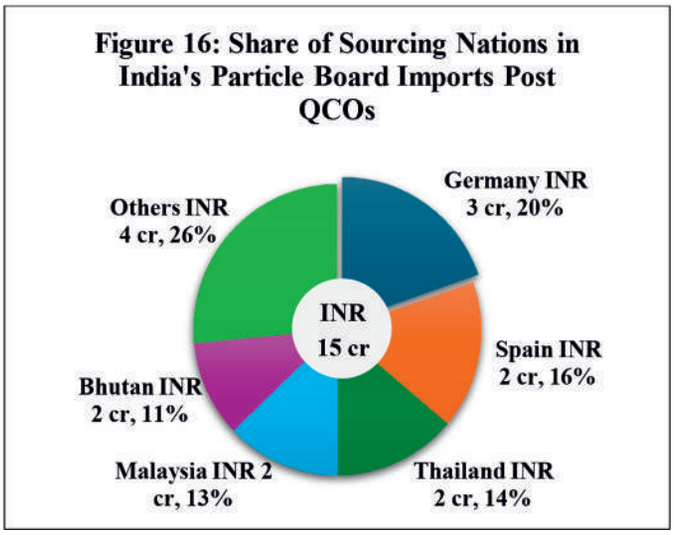




Figures 13 and 14 present the month-wise trend analysis of India's imports of medium-density fibreboard (MDF) and particle board. Just prior to the implementation of the QCOs, MDF imports stood at INR 88 crore in February 2025. This value declined siginificantly to INR 23 crore in March, followed by INR 19 crore in April and INR 22 crore in May 2025. A similar downtrend was observed in the particle board segment. Imports of particle board amounted to INR 17 crore in February, decreasing to INR 6 crore in March, INR 4 crore in April and INR 5 crore in May 2025.

3.2 Major Source Countries for India's MDF & Particle Board Imports in the Post QCOs Era





The source-country-wise distributions of India's MDF and particle board imports during the post-QCOs period (March, April and May 2025 combined) are shown in Figures 15 and 16.

Following the implementation of the QCOs, China emerged as the leading source country for India's MDF imports, contributing 43% of the total import value – amounting to INR 27 crore. Other major source countries included Thailand, Germany, Malaysia and Indonesia.

In the particle board segment, Germany became the top source country, exporting particle board worth INR 3 crore to India, which accounted for 20% of the total import value during the three-month period. Spain, Thailand, Malaysia and Bhutan also held significant shares in India's

particle board imports.

In terms of BIS compliance, only two foreign manufacturers – one from Thailand and one from Malaysia – were issued BIS licenses for MDF following the implementation of the QCOs. Despite China being the top source country for India's MDF imports, no Chinese manufacturer has been granted a BIS license, indicating that non-BIS-compliant MDF continues to enter the Indian market post QCOs implementation. For particle board, the compliance situation is more concerning. As of May 2025, no foreign manufacturer had been issued a BIS license for particle board yet imports worth INR 15 crore were recorded during the post-QCOs period. This indicates the continued entry of non-compliant products and highlights the urgent need for stricter enforcement mechanisms.

4. Conclusion & Way Forward

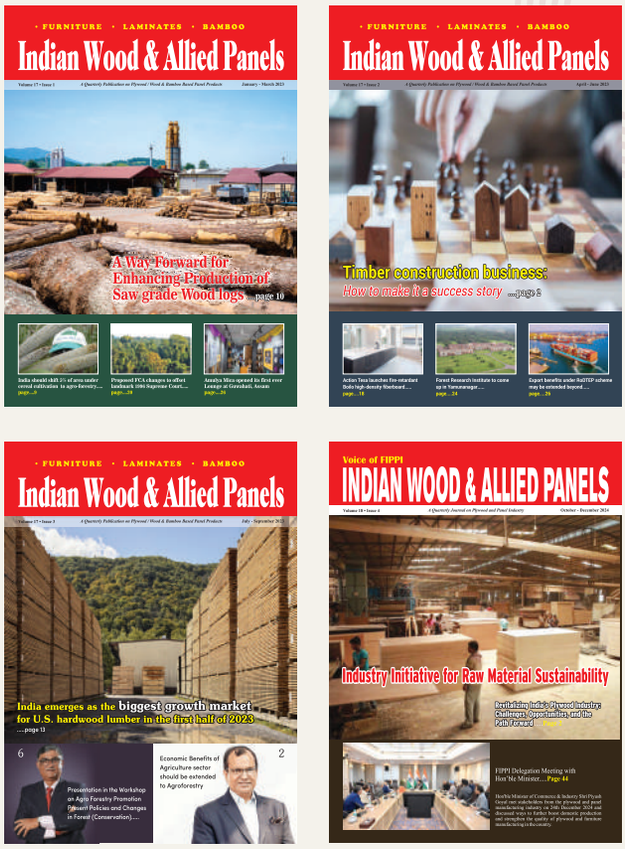
The examination of India's plywood and panel imports following the implementation of the QCOs reveals significant gaps in regulatory compliance. At first glance, the decline in import volumes suggests that the QCOs have been effective in restricting the entry of non-compliant products. However, a closer analysis indicates that substantial quantities of non-compliant plywood and panel products continue to enter the Indian market.

In the plywood segment, despite the mandatory BIS certification introduced in February 2025, a considerable volume of non-compliant plywood continues to enter India. Notably, no plywood manufacturer from key source countries such as Vietnam and China holds a BIS license for any category of plywood. Imports from Vietnam predominantly arrived via Jawaharlal Nehru Port of Navi Mumbai, while those from China primarily entered through Chennai Port. Moreover, all such imports have been classified under the 'Others' sub-category, which appears to be misinterpreted as exempt from mandatory BIS certification at Indian ports.

Similar trends are observed in the MDF and particle board segments, where imports continue from foreign manufacturers lacking BIS licenses. These developments undermine the purpose of the QCOs, place compliant domestic manufacturers at a significant disadvantage and expose consumers to potential risks from non-certified materials.

To address these challenges, it is imperative to strengthen collaboration between customs authorities and the BIS, enhance inspection procedures at Indian ports and conduct regular audits of imported consignments. Such measures are essential to fully realize the intended impact of the QCOs and ensure the quality and safety of plywood and panel products in the Indian market.❑

FEDERATION OF INDIAN PLYWOOD AND PANEL INDUSTRY



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FIPPI Requests Urgent Regulatory Action on Illegal Plywood Imports from Vietnam and China After QCOs Implementation

FEDERATION OF INDIAN PLYWOOD & PANEL INDUSTRY

REGISTERED UNDER THE SOCIETIES REGISTRATION ACT XXI OF 1860, REGN. NO. S/2985/1968-69 DT. 4.1.1969

1005, VIKRANT TOWER, 4, RAJENDRA PLACE, NEW DELHI110 008, INDIA
Phone No.: +91-11-2575 5649 • **E-mail:** fippi@fippi.org • **Website:** www.fippi.org

Chief Patron	Patrons	President	Senior Vice President	Vice Presidents	Director General
Mr. Sajjan Bhajanka	Mr. S.P. Mittal Mr. M.S. Vagh Mr. N.K. Aggarwal	Mr. Rajesh Mittal	Mr. Jaydeep Chitlangia	Mr. Jikesh Thakkar Mr. Keshav Bhajanka	Dr. M.P. Singh

FIPPI/18A-2025 June 13, 2025

To,

1. **Shri Amardeep Singh Bhatia**
   Secretary
   Department for Promotion of Industry and Internal Trade (DPIIT)
   Vanijya Bhawan, New Delhi

2. **Shri Sanjay Kumar Agarwal**
   Chairman
   Central Board of Indirect Taxes and Customs (CBIC)
   Department of Revenue, Ministry of Finance
   North Block, New Delhi

3. **Shri Pramod Kumar Tiwari**
   Director General
   Bureau of Indian Standards (BIS)
   Manak Bhawan, New Delhi

Subject: Illegal Imports of Non-BIS Certified Plywood and Panel Products Post QCOs Enforcement – Request for Immediate Regulatory Action.

Respected Sirs,

The Government of India has mandated specific quality standards for plywood and panel products entering the Indian market through the implementation of the 'Plywood and Wooden flush door shutters (Quality Control) Order, 2024,' effective from 28th February 2025 and the 'Wood Based Boards (Quality Control) Order, 2024,' effective from 11th February 2025. These measures are crucial for maintaining product quality, safeguarding consumer interests and promoting fair competition for the domestic industry.

However, a detailed analysis of import data indicates that even after the enforcement of QCOs, non-BIS compliant products continue to enter the Indian market primarily via Jawaharlal Nehru Port and Chennai Port. Despite illegal plywood imports worth more than INR 110 crore entering the Indian market post QCOs, no action has been taken under the Bureau of Indian Standards Act 2016.

FIPPI would like to highlight some serious concerns regarding this issue:

1. Trade data released by the Ministry of Commerce and Industry for March 2025 shows Vietnam as the leading source of India's imports of products under HSN Code 4412 during that month, followed by China. However, the BIS website indicates that, as of this date, no plywood manufacturing company from Vietnam or China has been issued a BIS license for any category of plywood.

2. Further analysis reveals that a substantial portion of plywood consignments from Vietnam and China, arriving in India after the implementation of the QCOs, are being declared under the 'Others' sub-category within HSN Code 4412.

a) 98% of all imported plywood products from Vietnam and 85% of all imported plywood products from China have been classified as 'Others' sub-category within the HSN Code 4412. It indicates that this category of products is being misinterpreted at the entry point as being exempted from the mandatory BIS certification whereas no such notification for exemption has been issued by the Department for Promotion of Industry and Internal Trade (DPIIT), Government of India.

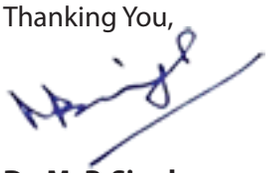
b) Therefore, it seems that there is a deliberate misuse of the 'Others' sub-category to circumvent QCOs requirements.

3. Furthermore, analysis reveals that plywood imports from Vietnam after the implementation of the QCOs primarily arrived through Jawaharlal Nehru Port and Chennai Port, while imports from China predominantly entered India through Chennai Port. The high volume of non-BIS certified imports arriving at these ports calls for a focused review of procedures being followed at these entry points.

These developments undermine the purpose of the QCOs and place compliant domestic manufacturers at a severe competitive disadvantage. It is therefore requested that the matter be examined with urgency and that a suitable framework be followed at all ports for the stronger enforcement of the QCOs.

Enclosed is a copy of our detailed analysis report on import data post QCOs enforcement.

Thanking You,



Dr. M. P. Singh
Director General,
Federation of Indian Plywood and Panel Industry (FIPPI)
New Delhi

FIPPI Demands Investigation into Abnormal Surge in Imports from Nepal-Based Plywood Manufacturers with BIS Licenses Post QCOs Implementation

FEDERATION OF INDIAN PLYWOOD & PANEL INDUSTRY

REGISTERED UNDER THE SOCIETIES REGISTRATION ACT XXI OF 1860, REGN. NO. S/2985/1968-69 DT. 4.1.1969

1005, VIKRANT TOWER, 4, RAJENDRA PLACE, NEW DELHI110 008, INDIA
Phone No.: +91-11-2575 5649 • **E-mail:** fippi@fippi.org • **Website:** www.fippi.org

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Mr. Sajjan Bhajanka	Mr. S.P. Mittal Mr. M.S. Vagh Mr. N.K. Aggarwal	Mr. Rajesh Mittal	Mr. Jaydeep Chitlangia	Mr. Jikesh Thakkar Mr. Keshav Bhajanka	Dr. M.P. Singh

FIPPI/16-3-2025 June 26, 2025

To,

1. **Shri Pramod Kumar Tiwari**
   Director General
   Bureau of Indian Standards (BIS)
   Manak Bhawan, New Delhi

2. **Smt. Nidhi Khare**
   Secretary (Consumer Affairs)
   Department of Consumer Affairs
   Krishi Bhawan, New Delhi

3. **Shri Amardeep Singh Bhatia**
   Secretary
   Department for Promotion of Industry and Internal Trade (DPIIT)
   Vanijya Bhawan, New Delhi

Subject: Urgent Request for Investigation into Misuse of BIS Licenses by Plywood Manufacturers from Nepal Post Quality Control Orders (QCOs) for Plywood.

Respected Sir/Madam,

The Government of India has enforced specific quality standards for plywood and panel products entering the Indian market through the implementation of the 'Plywood and Wooden flush door shutters (Quality Control) Order, 2024,' effective from 28th February 2025 and the 'Wood Based Boards (Quality Control) Order, 2024,' effective from 11th February 2025. Consequently, foreign plywood manufacturers are now required to obtain a valid BIS license to continue exporting plywood products to India.

Nepal, being one of the largest exporters of plywood products to India, accounted for approximately 21% share of India's plywood imports in FY 2024-25, with exports valued around INR 514 crore. Following the implementation of the QCOs, Nepal is currently the only country with nine plywood manufacturers under BIS licenses, making them eligible to export plywood products to India.

Import data for March shows that despite the mandatory BIS certification requirements coming into effect from 28th February 2025, a substantial portion of the plywood consignments imported from Nepal did not comply with

these regulations. Out of the total import value of INR 13.1 crore in March, consignments worth INR 10.7 crore originated from 30 manufacturers without BIS licenses. Subsequently, imports from non-BIS manufacturers ceased completely during the months of April and May, where plywood imports worth INR 9.4 crore and INR 22.6 crore respectively were sourced from manufacturers with BIS licenses. During the pre- QCOs period (January – February 2025), India had imported plywood worth INR 15.3 crore in total.

How did plywood imports from Nepal increase so sharply in May, despite only 9 out of 54 manufacturers having been issued BIS licenses?

Exporter-wise import data of May 2025 from Nepal to India show an abnormal surge in plywood volumes exported by BIS-certified plywood manufacturers from Nepal. Most of these manufacturers recorded a multi- fold increase in their export figures to India in May, compared to the trend observed during the January to April 2025 period.

a) For example, the BIS-certified plywood manufacturer, Ganpati Veneer Tatha Plywood Udhyog, exported plywood worth INR 0.4 crore to India during the January to April 2025 period. However, in May alone, its exports surged to INR 3.7 crore – representing an increase of nearly 11 times compared to the total export value during the previous four months.

b) Surprisingly, another BIS-certified manufacturer, Jhapa Veneer & Plywood Udhyog, exported plywood worth INR 1.9 crore to India during the January to April 2025 period. In May 2025, its exports rose sharply to INR 6.4 crore, more than 3 times its total exports during the preceding four months.

c) Volume-wise data reflects the same trend. Ganpati Veneer Tatha Plywood Udhyog exported approximately 0.2 million square meters of plywood to India during May alone, which is around eleven times the total volume exported from January to April. Jhapa Veneer & Plywood Udhyog exported

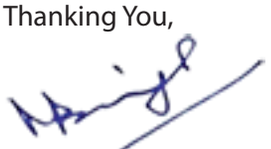
0.4 million square meters in May, more than three times its January to April volume. Likewise, Sawariya Plywood exported 0.15 million square meters of plywood to India during May, approximately 1.4 times its total exports in the January to April 2025 period.

The abnormal surge in export volumes from BIS-certified manufacturers to India points to a strong possibility that non-certified plywood is entering India under the cover of certified material. It appears that manufacturers holding BIS licenses are misusing their licenses to facilitate the entry of illegal plywood of non-BIS manufacturers into India, thereby undermining the primary objective of the QCOs.

Such misuse of BIS licenses undermines the regulatory framework and places compliant domestic manufacturers at a significant competitive disadvantage. Considering these regulatory violations, we strongly urge the authorities to initiate immediate investigations into the matter and to cancel the licenses of those manufacturers from Nepal found to be involved in facilitating the entry of illegal imports into India.

Enclosed is a copy of our detailed analysis report on imports sourced from Nepal post QCOs.

Thanking You,



Dr. M. P. Singh
Director General,
Federation of Indian Plywood and Panel Industry (FIPPI)
New Delhi

FIPPI Leadership Engages with the All Kerala Plywood and Block Board Manufacturers Association (AKPBMA) & the Sawmill Owners and Plywood Manufacturers Association (SOPMA) on 22nd May 2025 in Kerala: Discussing Opportunities, Challenges and Support for the Kerela Plywood Industry

Members Present:

1. Shri Mujeeb Rahman, State President AKPBMA & President SOPMA
2. Shri Rajesh Mittal, President FIPPI & Chairman-cum-Managing Director M/s. Greenply Industries
3. Shri Jaydeep Chitlangia, Senior Vice President FIPPI & Mentor M/s. Duroply Industries
4. Dr. M.P. Singh, Director General FIPPI
5. Dr. Vaidyanathan Hariharan
6. Dr. Prasanth MA, President SIPMA & Director AK Apple Ply Pvt. Ltd.

Introduction

A meeting of the plywood manufacturers and industry stakeholders was convened to discuss the current challenges, opportunities and support measures for plywood manufacturing units in Kerala and South India.

Discussion Points:

- Challenges for Kerala plywood units
- Role of small and medium units in the local economy
- Difficulties with BIS certification
- Potential for sustainable plywood production in Kerala
- Implementation of BIS quality standards
- Promotion of local plantations and alternate raw materials
- Need for quality control systems and regional testing centres
- Chemical retention requirements in shuttering plywood
- Reduction in plywood imports due to BIS amendments
- Coordination with BIS for feedback and suggestions

Shri Mujeeb Rahman, State President AKPBMA & President SOPMA, delivering the welcome address.

Mr. Mujeeb Rehman welcomed the gathering and highlighted the challenges faced by plywood manufacturing units in Kerala, such as rising production costs, stringent BIS standards and increasing unhealthy trade competition. He noted that unlike the large factories in North India, most units in Kerala are small and medium enterprises that play a vital role in the local economy by providing employment, supporting farmers through the use of plantation timber and sustaining the livelihoods of many families. Speaking about the recent amendments in BIS, he shared that small units are struggling to obtain and maintain certification.

He urged FIPPI to help make the BIS certification process more practical and accessible. He also emphasized that Kerala has the potential to become a model state for sustainable plywood production, as many units already follow eco-friendly practices. He requested the FIPPI's support in training and technology and hoped that FIPPI, with its strong ties to the central government, could extend assistance to industries in Kerala.


Reg. No. ER. 114/2010
In associate with
SOPMA
SAWMILL OWNER'S & PLYWOOD MANUFACTURERS ASSOCIATION
22.05.2025

Shri Rajesh Mittal, President FIPPI & Chairman-cum-Managing Director, Greenply Industries.

Mr. Rajesh Mittal, in his address, congratulated the plywood units in South India for their contributions to the Indian economy. He urged all units to implement BIS quality standards at the earliest, stating that the amendments would significantly curb plywood imports. He encouraged the association to promote local plantations to secure future raw material supplies and to explore alternate sources for timber and veneer. He assured that the FIPPI would provide all necessary support in these efforts.

Dr. M.P. Singh, Director General FIPPI.

Dr. M.P. Singh emphasized the need to implement robust quality control systems across plywood units and offered the FIPPI's help in achieving compliance with BIS standards. He pointed out the importance of setting up regional testing centres in Cochin, Kannur and Mysore to make certification easier. He assured that the matter of chemical retention requirements in shuttering plywood under IS 4990 would be taken up with the relevant authorities.

Shri Jaydeep Chitlangia addressed the challenges related to raw material availability, noting that plywood units in the South mainly depend on Rubberwood veneer, whose supply has declined sharply. He urged units to explore alternative sources of veneer and timber. He explained that the recent BIS amendments aim to reduce imports and improve the competitiveness of Indian products in line with the Prime Minister's vision of "Viksit Bharat." He noted that, before the implementation of the BIS amendments, approximately 1,000 containers were reaching Indian ports, but imports have since dropped considerably. He encouraged manufacturers to take advantage of this situation by adopting BIS standards and offered the FIPPI's assistance. He also suggested setting up cluster laboratories to reduce costs for small-scale units and requested the local associations to write to BIS with any feedback or suggestions, marking a copy to the FIPPI.

Shri Jaydeep Chitlangia, Senior Vice President FIPPI & Mentor, Duroply Industries.

Conclusion

The meeting concluded with a shared commitment to strengthen the plywood industry in Kerala and South India through collaboration, quality standards and sustainable practices. FIPPI assured its continued support and participants agreed to stay in close coordination on the agreed action points.❑

FIPPI Collaborates with Kannur University & the North Malabar Plywood and Door Manufacturers Association on 5th May 2025 in Kerala: Supporting Quality Compliance & Capacity Building for Kerala Plywood MSMEs

Members Present:

1. Shri Rajesh Mittal, President FIPPI & Chairman-cum-Managing Director M/s. Greenply Industries
2. Shri. Jayadeep Chitlangia, Senior Vice President, FIPPI & Mentor M/s. Duroply Industries
3. Dr. M.P. Singh, Director General, FIPPI
4. Shri P.K. Mayan Mohamed, Managing Director, The Western India Plywood Ltd
5. Dr. R.N. Kumar, Senior Research Scientist, Wood and Wood Adhesive
6. Dr. Vaidyanathan Hariharan
7. Dr. Prasanth MA, President SIPMA & Director AK Apple Ply Pvt. Ltd.
8. Shri Mujeeb Rahman, State President All Kerala Plywood Manufactures Association & President SOPMA
9. Shri. T.P Vasudevan, State Secretary All Kerala Plywood Manufactures Association
10. Shri. T.P Narayanan, President North Malabar Plywood and Door Manufacturers Association
11. Shri. B.P Abdul Gafoor, Secretary North Malabar Plywood and Door Manufacturers Association
12. Shri. Zainudheen. P, Treasurer North Malabar Plywood and Door Manufacturers Association

Discussion Points:

- Feasibility of establishing a plywood testing lab for Kannur MSMEs within the Department of Wood Science and Technology (WST), Kannur University
- Exploring collaboration opportunities between FIPPI and Kannur University for academic programs and skill development initiatives
- Strategies to implement Quality Control Orders (QCO) and enhance compliance among MSMEs in the region

- Recognition of contributions by industry leaders and stakeholders supporting quality and innovation

Meeting with Vice Chancellor and Registrar, Kannur University

Prior to the association meeting, Dr. M.P. Singh visited the Department of Wood Science and Technology at Kannur University to assess the available facilities and explore potential collaboration. The Vice Chancellor and Registrar expressed strong support for establishing a plywood testing laboratory, highlighting its importance for improving product standards and regulatory compliance among local manufacturers. Shri P.K. Mayan Mohammed, Managing Director of Western India Plywood, reaffirmed the company's long-term commitment to the MSc program in Wood Science and Technology and to advancing research, skill development, and innovation in plywood manufacturing.

Engagement with North Malabar Plywood and Door Manufacturers Association

The North Malabar Plywood and Doors Manufacturers Association, led by Shri T.P. Narayanan, warmly welcomed FIPPI representatives. The association was congratulated for joining the Zero Defect Zero Effect movement and for

supporting the implementation of the QCO, especially for MSMEs. The longstanding contributions of Western India Plywood, under the leadership of the Late Shri P.K. Kaderkutty (a founding member of FIPPI), were acknowledged, along with the ongoing support from Shri Mayan Mohamed.

Shri Rajesh Mittal assured the forum that FIPPI would provide the necessary equipment and technical assistance to Kannur University to operationalize the proposed testing lab, enabling MSMEs to produce certified, high-quality plywood.

Conclusion

The meeting concluded with FIPPI's proposal to establish a plywood testing laboratory under the leadership of Shri Rajesh Mittal. The valuable contributions of Western India Plywood and the commitment of the North Malabar Plywood and Doors Manufacturers Association to the Zero Defect Zero Effect movement were highly appreciated. All members agreed to collaborate closely to implement the project and to strengthen support for MSMEs in the region.❑

FIPPI Leadership Engages with the South Indian Plywood Manufacturing Association (SIPMA) on 4th April 2025 in Mysore: Discussing QCOs Implementation, Compliance Challenges & Industry Support

A joint meeting of the South Indian Plywood Manufacturing Association (SIPMA) and the Federation of Indian Plywood and Panel Industry (FIPPI) members was convened in Mysore on 4th April 2025 to discuss critical issues related to the implementation of the Quality Control Orders (QCOs). FIPPI was represented by its leadership – Shri Rajesh Mittal (President), Shri Jaydeep Chitlangia (Senior Vice President) and Dr. M.P Singh (Director General) – while SIPMA was represented by its President, Dr. Prasanth MA, along with other senior members. The meeting focused on key provisions of the QCOs, associated compliance requirements and the challenges being faced by manufacturers. It was agreed that comprehensive support – including certification guidance and the organization of training sessions – would be extended to industry members to ensure smooth and timely compliance with the new regulatory framework.❑

World Environment Day, 5th June 2025 FIPPI organizes a webinar on "Environmental Compliance for the Plywood Industry"

Background

The National Green Tribunal (NGT) recently directed the Ministry of Environment, Forest and Climate Change (MoEF&CC) to formulate environmental guidelines for plywood industries within six months. This directive was issued due to the lack of specific guidelines to regulate pollution from these industries. The NGT highlighted that plywood industries, categorized as "orange" with a pollution index of 78.3, are known to cause air and water pollution, but no guidelines have been issued regarding location, pollution control devices for prevention and control of air and water pollution, safeguards to be adopted in use of chemicals which have carcinogenic properties.

Meeting Summary

Considering the above NGT order, the Federation of Indian Plywood and Panel Industry (FIPPI) organized a webinar on the topic "Environmental Compliance for the Plywood Industry" on World Environment Day, 5th June 2025. The webinar brought together a diverse group of stakeholders, including industry professionals and researchers. The session focused on key environmental challenges, regulatory frameworks, health impacts, and sustainable practices in the plywood sector, a timely conversation considering the growing ecological concerns and industry responsibilities.

The members discussed various mitigation strategies, including air and water pollution control systems and waste management strategies. The discussion also covered the environmental clearance procedures, and the importance of adhering to environmental management plans and guidelines to improve industry categorization and reduce environmental impact.

Dr. Richa Bansal delivered the keynote presentation, offering a comprehensive overview of the environmental concerns surrounding the plywood industry. She highlighted major sources of air, water, soil, and noise pollution, focusing particularly on emissions from boilers, formaldehyde release, and improper waste disposal. She also addressed the health hazards faced by workers due to exposure to wood dust and formaldehyde.

The presentation further emphasized the absence of plywood-specific environmental standards and advocated for the adoption of cleaner technologies, robust waste management systems, and stricter adherence to environmental regulations to safeguard both human health and the environment.

Key Discussion Points

1. Industry representatives, Dr. Puroshottam and Mr. Rajeshwar Nair shared valuable insights into the pollution mitigation practices already in place at their facilities. They highlighted that their

facilities already include water scrubbers, zero liquid discharge systems and they implement recycling, green belts, and treated water reuse, with some operations being monitored online. The discussion emphasized the need to present these mitigation measures effectively to reduce the environmental impact index from the current 78.3 to improve their categorization from Orange to Green.

2. The members discussed the use of trimming waste from wood processing as a potential filler material for particle board and door manufacturing. Such initiatives were seen as a practical approach to reduce waste and enhance resource efficiency.

3. The meeting focused on environmental management and pollution control, with discussions about water consumption, industrial areas, and environmental impact assessments. Dr. Puroshottam and others discussed the need to monitor water usage in manufacturing units. Mr. Sonu Aggarwal clarified that plant capacity plays a significant role in determining regulatory requirements. Industries with production capacities above 1,000 tons per annum are governed by the guidelines of MOEF&CC, regardless of whether they are located within industrial areas. Mr. Suresh Bahety highlighted the importance of addressing wastewater management challenges in non-industrial zones and recommended the adoption of septic tanks or ETPs. He further stressed that internal environmental audits can be more effective than external inspections for sustained compliance. It was highlighted that most industries currently use multi-cyclones and water scrubbers, with kettle washing remaining a key challenge.

4. Dr. M.P. Singh urged all industry participants to apply for Environmental Clearance (EC), even if they already possess Consent to Operate, in anticipation of evolving legal requirements. Mr. Prashant advocated for the involvement of certified environmental consultants and auditors to ease the compliance process. Dr. M.P. Singh also suggested that FIPPI gather structured feedback from industry members to develop a standardized SOP for small-scale plywood and panel manufacturing units.

5. The meeting also discussed environmental compliance and consultancy processes, focusing on the approval of consultants and adherence to environmental norms. Dr. Puroshottam highlighted the need for electrostatic separators.

6. The participants agreed on several recommendations, including the need to install modern pollution control equipment, implement robust waste and effluent treatment systems, conduct internal audits, and maintain documentation of environmental practices. Green belt development around factory premises was also encouraged. Furthermore, it was suggested that industry associations like FIPPI could play a pivotal role in developing a common Environmental Management Plan template and coordinating with approved consultants to streamline the EC process.

Conclusion

The webinar served as an important platform to discuss the future of environmental compliance in the plywood industry. It brought to light the urgent need for regulatory clarity and industry-specific guidelines and emphasized the collective responsibility of stakeholders to contribute to a more sustainable manufacturing ecosystem. The session concluded with a strong commitment to implement best practices, engage with regulatory frameworks proactively, and ensure the long-term environmental and economic sustainability of the plywood sector.❑

Readers are invited to send views, comments and suggestions if any, addressed to Editorial board
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1005, Vikrant Tower, 4, Rajendra Place, New Delhi-110008, India
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E-mail: fippi@fippi.org, Website: www.fippi.org

Review Meeting of the Federation of Indian Plywood and Panel Industry Held on 14th May 2025 on Action Taken on FIPPI's Roadmap (since FIPPI Committee Meeting on 17th January 2025)

Members Present:

1. Shri Rajesh Mittal, President FIPPI & Chairman-cum-Managing Director M/s. Greenply Industries
2. Shri Jaydeep Chitlangia, Senior Vice President FIPPI & Mentor M/s. Duroply Industries
3. Shri Jikesh Thakkar, Vice President FIPPI & Senior Vice President M/s. Rushil Decor Limited
4. Dr. M.P. Singh, Director General FIPPI
5. Shri J.K. Jain, Senior Sustainability Advisor FIPPI & National Head (Plantation & Special Project) M/s. Greenply Industries
6. Shri Yatnesh Pandey, Vice President (Marketing) M/s. Greenply Industries

Dr. M.P. Singh commenced the meeting with a presentation on the Action Taken Report (ATR), highlighting various initiatives taken by FIPPI post the committee meeting held on 17th January 2025 in Delhi. The Action Taken Report (ATR) was categorized into five thematic goals, which were:

a. Product Standardization and Implementation (Quality Control Order)

b. Sustainability Initiatives

c. Enhance Membership Engagement and Improve Communication Channels

d. Policy Advocacy

e. Trade and Taxation

Discussions over First Agenda: Product Standardization and Implementation (QCO)

Dr. M.P. Singh presented the trade data and expressed concern over unauthorized imports entering India despite the implementation of QCOs in February 2025. He informed the forum that all these imports were from firms which do not possess a BIS (Bureau of Indian Standards) license. In response, Shri Jikesh Thakkar emphasized the need for developing a monitoring cell to track import data for at least a year and initiate actions such as lobbying the DPIIT or other governmental departments regarding unauthorized imports.

Shri Jikesh Thakkar further added that Shri Niladri has been monitoring import data on a real-time basis and FIPPI can seek his assistance. The forum agreed and decided that seeking Shri Niladri's help in training FIPPI's staff on accessing import data would be highly beneficial.

Dr. Singh further informed the forum that the task of developing the draft standards for fire-retardant MDF and particle board will be assigned to IWST (Institute of Wood Science and Technology). IWST conducted a seminar to discuss the subject with industry stakeholders in this regard and a project will be submitted by IWST for funding. He also mentioned that the draft standards for Flexi-Ply and Laminated Flooring Covering have been submitted to BIS. Dr. Singh noted that a meeting with BIS is scheduled for 6th June, where additional issues will be discussed.

Dr. Singh informed the forum that in March, a MoU was signed between IWST and IBBMA (Indian Bagasse Board Manufacturers Association), under which IWST will undertake a project funded by IBBMA. He further informed the members that following the meeting between FIPPI leaders, the North Malabar Plywood and Door Manufacturers Association and Kannur University in Kerela, it was decided that FIPPI would support the Department of Wood Science and Technology, Kannur University in conducting plywood product testing to assist Kannur's MSMEs. He also congratulated everyone on the success of the Study Tour to Vietnam (from 7th to 10th April), which focused on 'Production and Quality Excellence'.

Dr. Singh also shared the latest update that 4mm plywood is no longer exempt under IS 303 and it is stipulated that the requirements of base material would shift to IS 1328. In response, Shri Jaydeep Chitlangia suggested that plywood below 4mm plywood should remain exempt under IS 303. Dr. Singh explained that during the meeting with BIS on 13th May, FIPPI provided its inputs, but they were unacceptable by the BIS. He added that, going forward, FIPPI will submit its inputs under IS 1328.

Dr. Singh informed the forum that FIPPI should launch an awareness drive in collaboration with BIS to encourage consumers to purchase only BIS-certified products. The

forum agreed and decided that the 'BIS Awareness Drive' should be conducted as soon as possible. Shri Rajesh Mittal mentioned that he had met with Shri Pragath Dvivedi (Founder & Editor-in-Chief, Ply Reporter), who had agreed to assist in marketing the idea that consumers should purchase only BIS certified products through the Ply Reporter platform. He further added that Shri Yatnesh Pandey will collaborate with FIPPI to enhance the marketing efforts.

As additional suggestions, Shri Jaydeep Chitlangia proposed that the awareness drive should align with the Viksit Bharat and Make in India initiatives of the Indian government. Shri Jikesh Thakkar suggested that we can include the names of various associations and bodies associated with the Indian Plywood and Panel Industry, such as BIS, FIPPI, Ply Reporter, Ply Insight and ILMA (Indian Laminate Manufacturers Association), on the posters. Shri Rajesh Mittal suggested that the awareness drive should be conducted only after the QCOs are implemented for SSI (Small scale industries). He also recommended that the awareness drive should target two main points of contact: consumers at the point of purchase and dealers.

Discussions over Second Agenda: Sustainability Initiatives

Dr. Singh presented the initiatives taken by FIPPI so far under the broader agenda of raw material sustainability. He pointed out that FIPPI has received plantation data from five companies, which was also published in the latest issue of its quarterly magazine. He further requested that if more companies submit their plantation data along with write-ups, FIPPI will have ample material for the 'Raw Material Sustainability' section in its upcoming magazine issue. Additionally, he mentioned that FIPPI has called for proposals for the establishment of the Plantation Monitoring and Advisory System (PMAS) through the latest issue of its magazine and is seeking a capable organization for this task.

Dr. Singh further informed the forum that he had a comprehensive discussion with Shri J.K. Jain regarding the Eco Mark earlier. He added that the inclusion of the agro-forestry certification condition in the Eco Mark criteria would be problematic, as it would make it difficult for any company to qualify for the Eco Mark. He also mentioned that generating carbon credits through plantation efforts would not only benefit the industry but also help boost farmers' incomes. Additionally, he emphasized the need for conducting a workshop on sustainability.

Shri Rajesh Mittal suggested raising awareness among regional associations about sustainability so that they can begin working on it at their respective level. Shri J.K. Jain expressed his agreement with Shri Rajesh Mittal on this point. Furthermore, Shri Jaydeep Chitlangia informed the forum that he had previously discussed with Dr. Bipin Thapliyal (Secretary General, Indian Agro & Recycled Paper Mills Association) how different wood-based industries like paper, wood panels and wooden furniture, can work together to promote wood as a sustainable material and highlight its benefits over less sustainable alternatives. He added that within two months, a proposal outlining what needs to be done at both micro and macro levels is expected to be ready.

Discussions over Third Agenda: Enhance Membership Engagement and Improve Communication Channels

Dr. Singh commenced by outlining several initiatives undertaken by FIPPI to enhance membership and engage new members. These initiatives include participation in exhibitions such as Matecia and India Wood, the ongoing development of the FIPPI Coffee Table Book, the publication of the latest issue of FIPPI's magazine and the dispatch of over 150 copies to industry members. Dr. Singh further shared that under the 'New Membership Drive,' FIPPI had extended membership proposals to 20 companies within the Indian Plywood and Panel Industry. He continued by mentioning that FIPPI had successfully secured 3 new members and received renewal payments from 7 existing members, bringing the total membership of FIPPI to 10 members for FY 2025 – 26.

Discussions over Fourth Agenda: Policy Advocacy

Dr. Singh began the discussions by addressing the recent Madhya Pradesh High Court order on agri-wood. He then drew the forum's attention to the urgent need to advocate for the establishment of a dedicated 'Timber Products Development Council' within the DPIIT (Department for Promotion of Industry and Internal Trade). He further explained the benefits such a council could bring, including improved market regulation, enhanced market development and significant promotion of timber products.

Shri Rajesh Mittal inquired from the forum about whom we should approach to advocate for the establishment of the 'Timber Products Development Council.' In response, Dr. Singh suggested that we should take up this matter and seek a meeting with the Hon'ble Minister of Commerce & Industry, Shri Piyush Goyal. Dr. Singh further recommended that we involve all related associations, such as ILMA and AFMT (Association of Furniture Manufacturers and Traders), to strengthen the

advocacy efforts for the establishment of the council. The entire forum agreed with the suggestion to bring together all the related associations.

Discussions over Fifth Agenda: Trade and Taxation

Dr. Singh informed the forum that FIPPI is in the process of exploring the framework for GST rationalization. He mentioned that he had a meeting with Shri Ajay Kumar (Economics, Strategy & Sustainability Advisor at Merino Industries) earlier to discuss the matter. However, the process has been delayed due to a lack of support from PwC so far. In response, Shri Rajesh Mittal suggested holding a video conference with PwC early next week to move the discussions forward. He recommended including Shri Jikesh Thakkar, Shri Ajay Kumar and Shri Tejas (from Greenply Industries) in the video conference.

Shri Rajesh Mittal further inquired whether Shri Jikesh Thakkar had previously worked on advocating for an increase in export incentives for laminates. In response, Shri Jikesh Thakkar confirmed that he had indeed worked on raising the export incentive for laminates under the MEIS Scheme (Merchandise Exports from Indian Scheme). He further mentioned that his efforts had resulted in an increase in the export incentive for laminates from 1% to 3%.

Shri Rajesh Mittal continued by drawing the forum's attention to the pressing need to advocate for an increase in the export incentive on wood panels under the RoDTEP Scheme (Remission of Duties and Taxes on Exported Products). He added that under this scheme, the current export incentive on wood panels should be raised from 0.3% of FOB (Free on Board) to 4-5% of FOB. He emphasized that we should present rationales to government departments, highlighting factors such as green cover, employment, labour intensity and support for farmers.

Dr. Singh further mentioned that regarding the MIP (Minimum Import Price), FIPPI is seeking expert assistance with the calculation of the MIP. He suggested that an external consultant could be approached for this matter.

The meeting concluded with Dr. Singh delivering his concluding remarks, announcing that FIPPI's office would be ready by the following week. He thanked all the industry members of FIPPI for their support in getting the office ready. Dr. Singh further requested a FIPPI Committee meeting in the last week of May or the first week of June in Delhi, where the new office could be formally dedicated to the cause of the Federation of Indian Plywood and Panel Industry (FIPPI).❑

FIPPI Meeting with ARCL Organics Pvt. Ltd.

A meeting was held between the Federation of Indian Plywood and Panel Industry (FIPPI) and ARCL Organics Pvt. Ltd. to explore collaborative opportunities aimed at strengthening the Indian plywood and panel sector.

Company Overview

ARCL Organics Pvt. Ltd. is a prominent Indian chemical manufacturer specializing in formaldehyde and spray-dried powder resins, including amino and phenolic resins. They are known for their integrated formaldehyde-based downstream chemical complex and have a strong presence in the plywood and woodworking industry. They supply adhesives that are widely recognized for their quality and performance. With over six decades of experience, ARCL exports to nearly 50 countries worldwide. In addition to their global presence, ARCL has been deeply involved in the development of the Indian plywood industry since its inception and remains a go-to brand for innovation-driven solutions.

Meeting Highlights

The meeting was attended by Shri S.R. Mundra, Chairman & Managing Director of ARCL Organics Pvt. Ltd., and Ms. Vaishnavi Mundhra, Director – Strategy & Change Management. It commenced with an introductory presentation by the ARCL team, offering key insights into the company's operations, capabilities, and strategic focus areas.

Shri S.R. Mundra mentioned that they manufacture formaldehyde in concentrations ranging from 37% to 43% and their products are certified for the E0 and E1 formaldehyde emission classes. Keeping pace with the growing ESG awareness and commitment the company is working on this front. They have successfully started using clean hydrogen as a by-product from their new formaldehyde plant for hot air generator (HAG). This saves millions of rupees in cost and replacing use of fossil fuels like LDO, LSHS etc. They have also obtained compliance with effluent treatment plant (ETP) guidelines, including a zero liquid discharge and water treatment system.

Key Discussion Points

1. **Environmental Compliance and QCO Transition**

   Dr. M.P. Singh, Director General, FIPPI, emphasized the increasing environmental compliance requirements in the plywood industry in India. He told that as the industry is transitioning towards a new phase after QCO implementation, environmental norms will be more stringent following the recent directives from the National Green Tribunal (NGT). He further suggested that if resin making is outsourced, then industries can focus on plywood manufacturing and make standard quality products. He admired the potential of ARCL Organics and suggested that this company can play an important role in providing resins to the industry.

2. **Potential for Cluster Development**

   Dr. M.P. Singh proposed that ARCL can consider establishing Urea Formaldehyde (UF) resin clusters in regions such as Kerala and Perumbavoor, where plywood manufacturing is densely concentrated. He also highlighted the potential for future expansion in northern regions like Rudrapur and Sitapur in Uttarakhand.

3. **Development of E0 Emission Testing Method**

   Currently, Indian standards include only E1 and E2 formaldehyde emission classifications, with no existing method for E0 classification. Dr. M.P. Singh recommended that the Institute of Wood Science and Technology (IWST) could undertake a project to develop a standardized testing method for E0 emissions, aligning it with international benchmarks. He invited ARCL Organics to sponsor this initiative to develop testing method for E0 and align it with international standards.

4. **FIPPI Membership and Industry Engagement**

   Dr. Singh encouraged ARCL Organics to become an associate member of FIPPI and contribute an advertorial to the FIPPI quarterly magazine, highlighting their innovations and advancements. He also emphasized the need to bridge the gap between industry expectations and the current offerings from ARCL.

5. **Mass Timber Demonstration Project**

   Dr. M.P. Singh discussed the upcoming mass timber building demonstration at IWST, suggesting that ARCL participate in the project by supplying and testing their adhesive systems. There was also a proposal for ARCL to leverage their Russian counterparts' expertise in developing a mass timber floor, contributing to the demonstration initiative.

Conclusion

Shri S.R. Mundra, Chairman, ARCL Organics expressed keen interest in collaborating with FIPPI and IWST and assured their support in promoting environmentally compliant practices in the plywood industry. They agreed to explore joint initiatives in research, testing, and sustainable manufacturing going forward.❑

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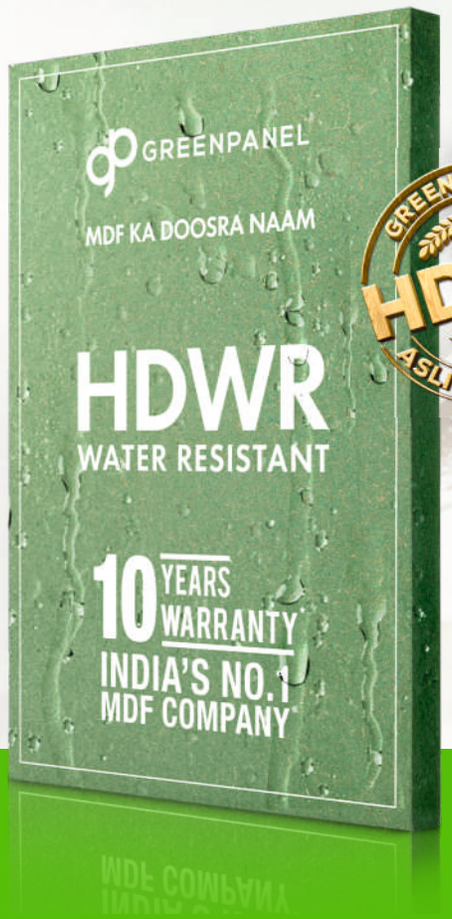

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