IJIRA

NEWSLETTER

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Editorial Board

- Dr. Pradip Chakrabarti
- Soumita Chowdhury
- Partha Sanyal
- Ipsita Roy
- Apsara Nath
- Jitesh Kayal
- Kuntal Chakraborty

From the Desk of the Director

- ***Bamboo Fiber Extraction*** **: IJIRA is advancing quickly toward establishing a pilot plant for bamboo fiber extraction, aiming to set a new benchmark in record time.**
- ***Bharat-Tex 2025 Showcase*** **: At Bharat-Tex 2025, IJIRA showcased its innovative fiber extraction process, attracting significant interest from participants. The spotlight was also on composites for auto parts and bio-based agromulch.**
- ***Bio Agromulch*** **: IJIRA developed cost-effective alternative to plastic mulch showing better results during field trials on different crops, offering a sustainable solution to reduce plastic waste.**
- ***Spinning Frame Automation*** **: Adoption of Retrofit solution for automation in spinning frame by a mill is in progress.**
- ***Carding Machine Innovation*** **: Pneumatic control roll farmer for smooth operation which eliminates oil contamination in jute fibers, enhancing both quality and sustainability.**
- ***Skill Development*** **: Two IJIRA courses approved by NCVT under NTTM Scheme further strengthening its contribution to workforce empowerment.**

Stay tuned for more updates as IJIRA continues to lead innovation and sustainability in the industry !

Dr. A. K. Sharma
Director, IJIRA

NEW TECHNOLOGIES

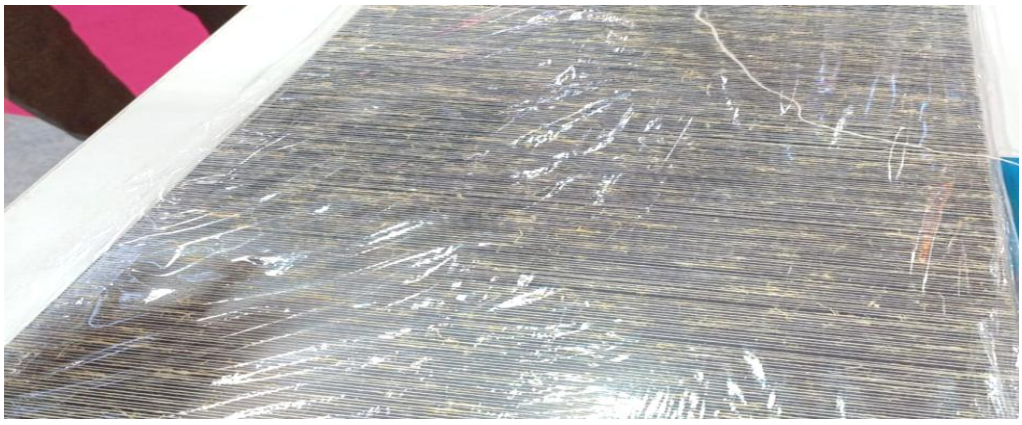
Technology No. 1:

EXTRACTION OF NATURAL BAMBOO FIBERS (NBF)

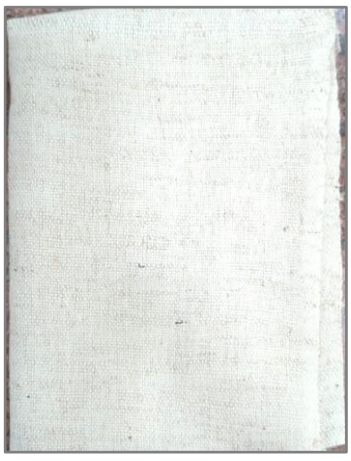
IJIRA has processed 200 kg of bamboo strips from two different species for fiber Blending and Product Development.

The project explored various blending options:

- **NBF was blended with jute, viscose and cotton to create blended yarns**
- **These yarns were woven on handlooms to produce shirts and jackets**
- **The resulting products were showcased at Bharat-Tex 2025, demonstrating their market potential.**
- **IJIRA could make 10/1 Ne blended NBF:Viscose yarn & subsequently made finer yarn of 16/1 Ne.**



16/1 Ne NBF:Viscose yarn (15:85)

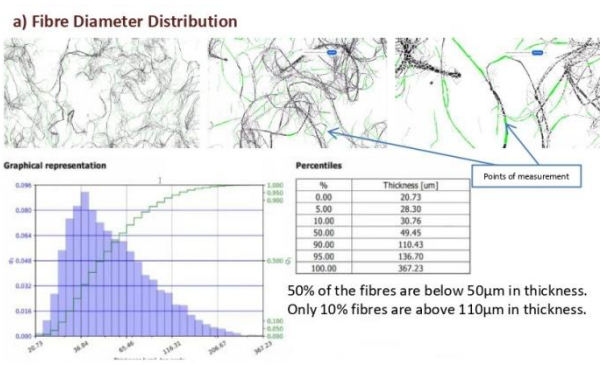



Fiber Morphology and Refinement

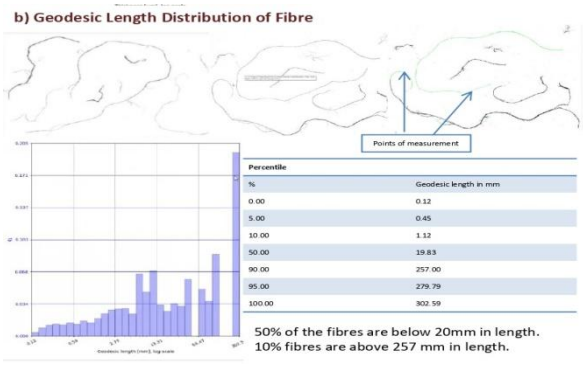
A detailed morphological study, conducted in collaboration with a Switzerland company, revealed:

- **The developed NBF has a diameter ranging from 20-90 microns**
- **Further refinement resulted in 50% of fibers falling within the 20-50 micron range**

Trials of a 15% NBF:Viscose blend yarn (10/1 Ne & 16/1 Ne) showed promising results, giving an impression of more than 30% bamboo content.



%	Thickness [µm]
0.00	20.73
5.00	28.30
10.00	30.76
50.00	49.45
90.00	110.43
95.00	136.70
100.00	367.23



%	Geodesic length in mm
0.00	0.12
5.00	0.45
10.00	1.12
50.00	19.83
90.00	257.00
95.00	279.79
100.00	302.59

To further improve fiber quality

- **Enzymatic treatment has been implemented effectively**
- **Samples have been sent to two institutes in UK for advanced morphological analysis of fine fibers**
- **It is hoped that IJIRA may be able to make 20-26/1 Ne NBF blended yarn for life style products.**

Raw Fiber *Raw Fiber* *Dia 20-320 µm* *Dia -18-101µm* *Dia 20-35 µm*

Scaling Up and Industry Collaboration

Plans are underway to:

- **26 kg carded bamboo fiber sent to Bikaner for getting blended bamboo wool yarn for trials.**
- **Set up a pilot plant capable of processing 50 kg/day of bamboo strips**
- **Establish MOUs with three industries for bulk trials of bamboo-blended yarn**
- **Focus on developing products for the towel, socks and innerwear sectors**
- **Study the antimicrobial properties of bamboo-blended fabrics**

Project Achievements

- **Benchmarks of the 6 months duration NTTM-funded project have been met within three months as per directive of HMOT.**
- **A provisional Patent has been filed on extraction method of NbF.**

The success in developing soft bamboo fiber is largely attributed to the motivation and mentorship provided by the HMOT, driving innovation in sustainable textile production.

Pilot Plant for Bamboo Fiber Extraction enabling IJIRA to supply Bamboo Fiber to different Industries on regular basis for market development

9 roller machine under fabrication based on satisfactory performance of 3 roller prototype machine with servo motor drive

New Project Proposal

- **Innovative Bamboo Residue Project being formulated for submission under NTTM aims to Revolutionize Technical Textiles. IJIRA Partners with UK Institutes and Indian Industry Leaders to Develop High-Value Products from Bamboo remains.**

Key Developments

- **Technology for manufacture of Nanocellulose**
- **Technology for artificial limbs production through 3D-printed using Nanocellulose**
- **Wood-Plastic Composites for doors, panels, and ship flooring & decking**
- **Lightweight automotive parts**
- **Hybrid noise barriers for highways, railways and to create quite zones near hospitals & schools**
- **Bamboo composite pipes for underground oil/water reticulation infrastructure**

IJIRA IN BHARAT TEX 2025

IJIRA Showcased Innovative Natural Fiber Technologies at Bharat Tex 2025. It made a significant impact at Bharat Tex 2025, held from February 14-17 at Pragati Maidan, New Delhi.

IJIRA's booth, featuring cutting-edge projects and technologies included:

- ✓ **Bamboo fiber extraction process and its blended yarns**
- ✓ **Economically viable Agromulch for farming as replacement of plastic mulch**
- ✓ **Light weight non functional auto components based on sustainable principle**
- ✓ **Land reclamation technology using jumbo jute bags as a sustainable solution for regions facing rising sea levels and land scarcity.**
- ✓ **Utilization of Guard hair of Pashmina goat for value added products such as tents, quilts and jackets for extreme cold protection.**

Additionally, IJIRA presented bamboo fiber extraction as well as fiber, blended yarns and garment samples at the "Fibers of New Bharat" stall, dedicated to the NTTM.

IJIRA stalls have attracted over 500 visitors who expressed keen interest in bamboo fiber and its blended yarns, economically viable agromulch and bamboo/jute based PP granules.

IJIRA's participation underscored the increasing demand for eco-friendly solutions and advanced natural fiber technologies in India's evolving textile landscape.

Innovating Natural Fibers for Sustainable Future

NEW TECHNOLOGIES

Technology No. 2:

Economically viable Bio-agromulch to replace plastic mulch in agriculture sector

After encouraging results on Brinjal crop, field work has been conducted on two additional crops, *i.e.*

1. **Broccoli**
2. **Strawberry**

Broccoli Production increased by 56.67% in organic agromulch in comparison to that of control (without using mulch) and comparatively more w.r.t polymulch. Trials will be repeated in due course.

Results for available NPK for Broccoli were very encouraging as seen by the table below,

Soil Parameters Study for Broccoli Trial

Parameter	Experimental Sample	pH	E.C (dS/m)	Available OC %	Available N (kg/ha)	Available P (kg/ha)	Available K (kg/ha)
Before	Sample	8.01	0.14	0.29	202.7	40.3	373.1
After 60 days from DAP	Jute Wool Agromulch	7.97	0.12	0.38	201.6	15	121.1
	PolyMulch	8.32	0.12	0.27	176.4	13.5	115.5
	Without Mulch	7.91	0.09	0.20	138.6	10.6	111.8

Broccoli Trial in Sargachi, Murshidabad,WB

Strawberry Trial in Muktapur, Assam

NEW TECHNOLOGIES

Technology No. 3:

RETRO-FIT FOR AUTOMATION OF SD FRAME FOR JUTE SPINNING

IJIRA has installed retrofit automation system on a 100 spindle slip draft jute spinning frame in one industry at its request. Initial trouble shootings are being suitably addressed.

NEW TECHNOLOGIES

Technology No. 4:

PNEUMATIC CONTROLLED ROLL FORMER AT CARDING MACHINE

1st phase completed successfully in a mill.

2nd phase targets:

Automatic measurement of,

- ✓ **Moisture Regain (%) of jute roll**
- ✓ **Weight of roll**
- ✓ **HMI based smart display system to display**
  - **Roll count**
  - **Weight**
  - **MR%**
  - **MR adjusted roll wt/shift,**

for smooth operation at Carding stage

Automatic weight & MR% measurement in Pneumatic Controlled Roll Former

SKILL INITIATIVES

- **Ongoing Skilling Programme**
  - **Programmable Logic Controller (PLC) Programmer and Troubleshooter: 13 Nos.**
  - **Jr Supervisor in Jute Spinning (at IJIRA Kolkata): 18 Nos**
  - **Jute Product Stitching Operator (at IJIRA NERC): 16 Nos**
  - **Jute Product Stitching Operator (at Purulia): 42 Nos**

13 candidates have completed On Job Training (OJT) in 3 Automation factories

- **NCVET has approved following two courses *under Technical Textile scheme* focusing on geotechnical Textiles focusing on natural fibres on 42nd NSQC meeting which was held on 18.02.2025.**
  - **(i) Fundamentals of Geotextile and its Application (Natural Fibre)**
  - **(ii) Junior Technician (Natural Fibre - Geotextile and its Application)**

- **NCVET approved courses have been uploaded in National Qualifications Register (https://nqr.gov.in) portal**

Approved Courses by NCVET	Duration	National Qualification Registrar code
i. Junior Quality Control Technician (Jute Production) (Level – 4 of NSQF)	480 hrs	QG-4.4-TX-03260-2024-V1-IJIRA
ii. Jute Manufacturing Technician (Elective 1: Yarn, Elective 2: fabric) (Level – 4 of NSQF)	Min. 510 hrs Max. 510 hrs	QG-4.4-TX-03261-2024-V1-IJIRA
iii. Jute Machine Maintenance Technician (Elective1: Spinning machinery, Elective 2: Weaving Machinery) (Level – 4 of NSQF)	Min. 510 hrs Max. 510 hrs	QG-4.4-TX-03259-2024-V1-IJIRA
iv. Jute Loom Weaving Operator (S4 loom) (Level – 3 of NSQF)	300 hrs	QG-03-TX-01973-2024-V1-IJIRA

TESTING / CONSULTANCY SERVICES

Performance of service departments–

	Physical Testing	Chemical Testing
Sample tested	41	67 (Non-FGJP)
Moisture Meter calibrated	146	-
FGJP Lot inspected & tested	-	4
Interim FGJP Audits	-	8

No. of bales of B.Twill/A.Twill bags inspected	1,50,000+
Training & Consultancy provided to Mills	03

EVENTS

- IJIRA participated in Bharat Tex 2025 at Pragati Maidan, New Delhi.
- 125 nos. of mini moisture meters for farmers' use have been delivered to different branches of JCI.
- Dr. Pradip Chakrabarti attended a meeting with C-DAC for Aadhaar Based Attendance system development.
- Mr. Partha Sanyal visited S. D. Polytech Pvt. Ltd. at Sitarganj, Uttarakhand for technical discussion on blending of bamboo-excel.
- Director visited S D Polytech Pvt. Ltd. at Sitarganj, Uttarakhand for trials of bamboo fiber to get blended yarn.
- Mr. Gopal Mukhopadhyay & Mr. Subhankar Bej visited RDB Textiles Limited for training and technical assistance.
- Mrs. Soumita Chowdhury & Mr Gopal Mukhopadhyay attended a meeting at IJMA on raw jute grading system.
- Mr. Partha Sanyal attended a meeting at NAFED on inspection matter.
- Mr. Wasim Ali visited Weaving and Designing Training Center, CWDB, Kullu, Himachal Pradesh for weaving of bamboo-viscous blended fabric.
- Mr. Ishan visited Tuli, Nagaland for making bamboo strips to be sent to Kolkata.
- Mrs. Soumita Chowdhury visited Gloster Nuvo Ltd., Hastings Jute Mill & Kamarhatty Co. Ltd. on SQC.
- A project on performance requirement for JGT for rain water erosion control has been sanctioned by BIS.


NEFITS OF BAMBOO FIBER TEXTILES
Breathable & Soft – Ideal for home textiles
Naturally Antibacterial – Reduces odor & allergens
Biodegradable & Sustainable – A step towards circular
textiles
PLICATIONS:
Home Textiles – Sheets, towels & upholstery
Sustainable
JUMBO BAG


bags (jute, sisal) reduce plastic
waste & carbon footprint
Sediment Stabilization – Fills
with locally sourced sand/sediment
to create erosion-resistant barriers
Cost & Labor Efficiency – 40%
Indian Jute


GUARD HAIR:
INSPIRED BY LADAKHI NOMADIC TRADITIONS
– ENGINEERED FOR THE FUTURE
Traditional Uses of Guard
Hair
Brushes
Interfacings
Other Non-apparel
uses
TECHNICAL
TEXTILE
INNOVATIONS FOR
UNLOCKING
EXTREME COLD
PROTECTION
Why Guard Hair?
SUSTAINABILITY IN FARMING WITH
STITCH BONDED AGROMULCH
Reduces Soil Erosion – Prevents topsoil loss & enhances soil
fertility
Moisture Retention – Reduces water consumption by up to 50%
Weed Suppression – Lowers dependency on chemical herbicides
Temperature Regulation – Protects crops from extreme weather
IMPACT & ADOPTION
Supports sustainable & organic farming
Reduces plastic-based mulch usage, promoting eco-friendly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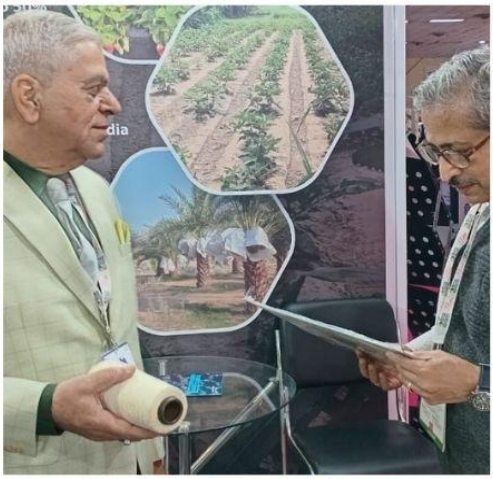


ECO-ENGINEERING CO
Enhanced Coastal Protection
Restoring Ecosystem Services
Cost & Labor Efficiency – 40%
lower cost than stone/concrete
alternatives
JUMBO BAG


JUMBO BAG
Merging Sustainable Packaging
Innovation with Coastal Engineering
for
Regions facing Rising Sea Levels &
Land Scarcity