

WOOL RESEARCH ASSOCIATION

(Approved Body of Ministry of Textiles, Govt. of India, New Delhi)

P. O. Sandoz Baug, Kolshet Road,
Thane - 400 607 (Maharashtra)



58th ANNUAL REPORT AND ACCOUNTS FOR THE YEAR 2022 - 2023

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PRESIDENT	-	SHRI. H.K. CHATTERJEE, RAYMOND LIMITED
SR. VICE PRESIDENT	-	SHRI DEEPAK GOEL GEETANJALI WOOLLENS P. LTD.

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MEMBERS (EX. OFFICIO)

1. SHRI. M.K. BARDHAN, DIRECTOR GENERAL - EMERITUS, WOOL RESEARCH ASSOCIATION
2. SHRI. K.K.MISRA, DIRECTOR, WOOL RESEARCH ASSOCIATION

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1. MR.JYOTIRANJAN PARIDA, WOOLMARK SERVICES INDIA PVT LTD
2. SECRETARY GENERAL, I.W.M.F., (EX. OFFICIO)
3. SHRI. POSHAK PATEL, MANAGING DIRECTOR
GUJARAT SHEEP & WOOL DEVELOPMENT CORPN., AHMEDABAD
4. DR. S.K. CHAUDHURI, FARIDABAD, HARYANA
5. THE GENERAL MANAGER, ORDNANCE CLOTHING FACTORY, SHAHJAHANPUR
6. ALL OTHER ORDINARY MEMBERS OF WRA.

TECHNICAL CUM RESEARCH ADVISORY COMMITTEE (TRAC) (2022-2024)

CHAIRMAN : SHRI. H.K.CHATTERJEE

MEMBERS :

- | | |
|-------------------------------|--|
| 1. DR.R.V. ADIVAREKAR | - I.C.T., MUMBAI |
| 2. SHRI. G. S. BHATI | - CENTRAL WOOL DEVELOPMENT BOARD, JODHPUR |
| 3. DR. ARUN KUMAR TOMAR | - C.S.W.R.I., AVIKANAGAR |
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| 10. DR. J. PAMPAPATHI | - M.D., K.S & W.D. CORPN. LTD, BENGALURU |
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| 25. DR.VIKAS B.THAKARE | - JD, DEFENCE RES. & DEV. ESTABLISHMENT, GWALIOR |
| 26. DR. R.S.CHAUHAN | - IDST SCIENTIST,DRDE, GWALIOR |
| 27. SHRI.RAVIKANT KAPUR | - CHAIRMAN EMERITUS, WRA (EX-OFFICIO) |
| 28. SHRI. M.K. BARDHAN | - DIRECTOR GENERAL - EMERITUS (EX-OFFICIO) |
| 29. SHRI.K.K. MISRA | - DIRECTOR, WRA (EX-OFFICIO) |
| 30. DR. MRINAL CHOUDHARI | - JOINT DIRECTOR, WRA (EX-OFFICIO) |
| 31. MS. SEEMA PATEL | - JOINT DIRECTOR, WRA (EX-OFFICIO) |

NOTICE

NOTICE IS HEREBY GIVEN THAT the 58th Annual General Meeting of The Wool Research Association will be held at the Wednesday, 27th September, 2023 at 12.30 p.m. **in the Conference Room, Wool Research Association, P.O. Sandoz Baug, Kolshet Road, Thane - 400607** to transact the following business :

1. To welcome members and invitees and to read out the notice.
2. To confirm the minutes of the last Annual General Meeting held on 28th September, 2022.
3. To receive and adopt the Annual Report and Accounts of the Association thereon for the year ended 31st March, 2023.
4. To appoint Auditors for the year 2023 - 24 and fix their remuneration by passing following resolution.

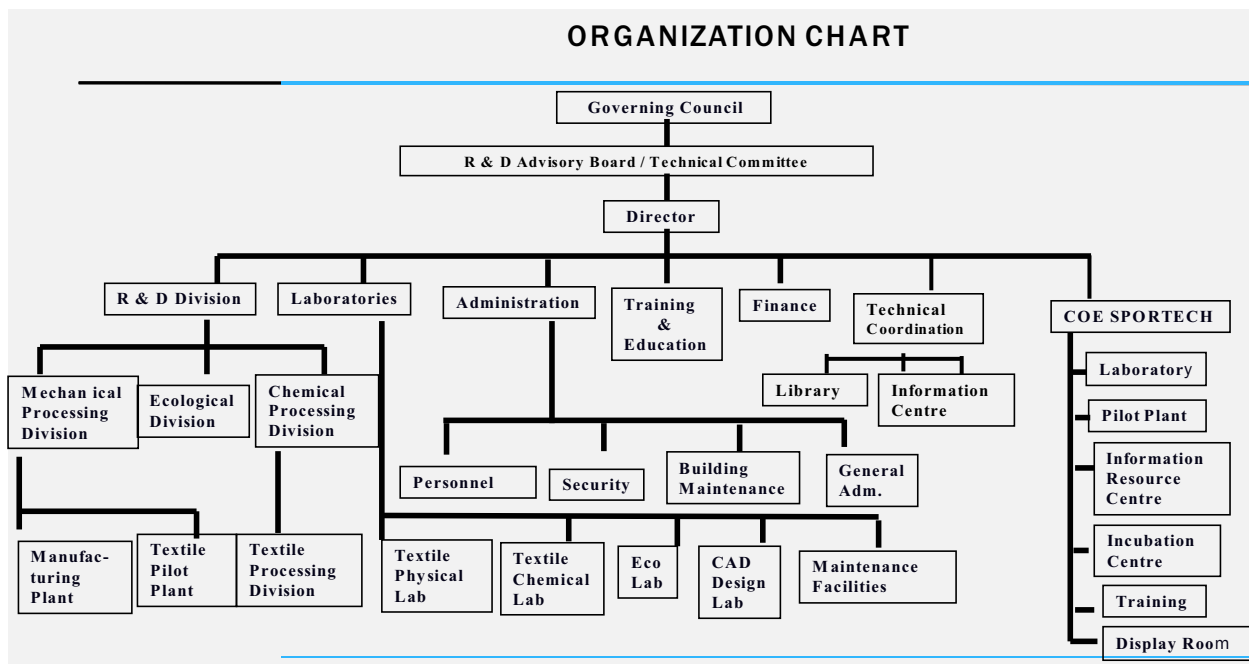
“Resolved that M/s. J.P.J ASSOCIATES LLP, Chartered Accountants, D/401, Shantidwar C & D Wing CHS., Shantivan, Borivali (East), Mumbai – 400 066, the retiring Auditors, being eligible for re-appointment, be and hereby appointed as the Auditors of Wool Research Association for the year 2023-2024 on remuneration of Rs.75,000/- plus GST”.

5. Any other matters with the permission of the chair.

BY ORDER OF THE GOVERNING COUNCIL

**(K.K. MISRA)
DIRECTOR & C.O.O.**

Dated : 24th August, 2023

ANNUAL TECHNICAL REPORT 2022- 2023**1.0 INFRASTRUCTURE**

Wool Research Association (WRA) is well equipped with necessary infrastructure in Research and other technical activities as expected from a TRA. The organization has its own sprawling campus of over 13 acres land at Thane.

It has its own accommodation where following infrastructure has been created over last five decades of its existence.

1. Accredited Textile Physical Laboratory
2. Accredited Textile Chemical Laboratory
3. Research & Development Division
4. Eco-testing Laboratory
5. Textile Technology Laboratory
6. Pilot Plant
7. Library
8. Training facilities with classrooms, teaching aids etc.
9. Auditorium & conference room with audio system
10. Computers, LCD projectors, Over head projectors
11. Information & Technology Co-ordination Centre
12. Administrative & Accounts Department
13. Center of Excellence – Sportech

Wool Research Association (WRA), Thane Maharashtra has been registered with the Department of Science and Industrial Research (DSIR) for the purpose of availing customs duty exemptions, the registration is valid up to March 2024.

2.0 CENTRE OF EXCELLENCE FOR SPORTECH

Under Ministry of Textiles Technology Mission in Technical Textiles, WRA has set up a Centre of Excellence in Sportech. A state of art testing facility and incubation centre has been established and simultaneous efforts have been made to attain international accreditations and collaborations. WRA has been serving user industry through its wide testing facilities and development of affordable products in India without compromising functionality and performance of our athletes. Wool Research Association's COE-Sportech team visited various Sportech Segments for market survey of Sportech, they covered areas such as North Zone – Panipat, Meerut, Jalandhar and Ludhiana, South zone – Tirupur and Coimbatore along with Hyderabad

3.0 TYPE OF ACTIVITIES

- i. Research & Development
- ii. Testing/Evaluation service to the Industry, Export Oriented Organisations, Government organizations etc.
- iii. Colour Technology
- iv. Training & Education
- v. Research in the Emerging Technologies like Technical Textiles, Plasma & Nano technology, Phase change materials, IT, Smart Textiles, Supercritical Processing etc.
- vi. Technical services to the Decentralised Carpet Industry, SMEs, Cottage/Rural industry.
- vii. Technology Development in Woollens & Manmade Textiles
- viii. Technical Survey & Audit of Industrial Units
- ix. Technical Feasibility Report Formulation
- x. Turnkey Projects
- xi. Research, training, prototype development, etc in Sportech.
- xii. Market survey of Sportech segment

4.0 TEXTILE TESTING LABORATORY

▪ Textile Testing and Analysis (2022-2023)

Detail	2021-22	2022-23
No. of Client Request received	4968	5946
No. of Samples Tested	29722	32935
Client Base	1178	1300
Revenue Generation (in Lakhs)	272.91	422.73
NABL accreditation parameters	415	634

5.0 YARN & FABRIC MANUFACTURING FACILITIES – PILOT PLANT

Pilot plant is equipped with yarn manufacturing facilities for spinning worsted yarn, friction spun yarn, blends of wool with other natural and synthetic fibers.

The facilities available with pilot plant including machineries of Centre of Excellence - Sportech is as mentioned below:

Technology & Application Centre

A. For Long Staple Fibre: Fiber to Sliver conversion

1. Carding Machine
2. Gill Box
3. Combing Machine

B. Yarn Innovation Center - From Sliver/Top to Innovative /functional yarn

1. Roving frame
2. Ring frame
3. Sliver to yarn ring frame
4. Friction Spinning System (DREF 2)
5. Winding machine (Cheese)
6. Two for one Twister

The friction spun yarn manufacturing constitutes a full - fledged six spindle friction spinning machine to spin homogeneous yarn from textile wastes and special technical fibers and engineered yarn for specifically technical textiles.

C. Knitted / Weaving Centre From innovative Yarn to fabric

1. Sectional warping machine
2. Weaving Machine (Rapier Loom)
3. Circular Knitting Machine
4. Direct Warping machine
5. Warp Knitting Machine (Tricot)
6. Warp Knitting Machine (Raschel)

Knitting Facility also includes hand knitting machine, semi automatic flat bed knitting machine. Miniature handlooms for developing woven fabric samples.

D. Coating & Laminating Facility

1. Hot melt Coating and laminating machine
2. Fabric rolling machine (Fabric preparation for coating/lamination: fabric from fold to roll, roll to roll)

E. Light Weight Sport Goods Composite Center

1. Heating oven
2. Cold storage chamber
3. Degassing unit
4. Zero grade granite surface table
5. Vacuum pump
6. Braiding machine (Facility under Installation)
7. Precision winding machine

F. Other Machines

1. Compression Moulding Machine
2. Shoe stitching machine
3. Industrial Sewing Machine
4. Ultrasonic Sealing Machine
5. RF sealing machine
6. Hank to cone winding machine

These machines are being utilized for product development related to sport textiles and other technical textiles.

Carpet Manufacturing Facility

Apart from the above, Pilot plant is also equipped with carpet manufacturing facility. Hand Knotted carpet can be produced.

Products Developed

- UV Repellent Sport Nets
- Tubular Nets for Oil Boom
- Sport Fabric
- Stretchable fabric
- Terry Fabric
- Seat Cover Fabrics
- Curtains
- Fabric for lamination
- Flag fabric
- Home Furnishing Fabric
- Jute/Wool Based Hand Knotted & Hand Tufted Carpets

6.0 ECO LABORATORY

WRA's ECO laboratory is equipped with analytical instruments like HPLC, Particle size analyzer, UV-Vis Spectrophotometer, ICP-OES, FTIR, DSC. Testing such as Formaldehyde, Heavy Metals, Moth proofing, particle size of dry and liquid sample, thermal analysis, (bioassay and chemical assay) etc. can be performed in the facility.

Eco Laboratory also provides short term training and consultancy as per client's requirement.

7.0 TEXTILE CHEMICAL & COLOUR DEPARTMENT

Textile Chemical & Colour department is involved in R&D and testing related to Textile Wet Processing (Textile pre-treatment, dyeing & Finishing), advanced textile technology like Plasma treatment, ultrasonic treatment, functional finishing, coating, colour difference measurement, quality control, yellowness & whiteness index measurement. It is also involved in colour recipe prediction service for all customer specific requirements. It also has top and yarn dyeing facility up to 1 kg. Chemical & Colour department also conducts short term Advanced Courses in Colour Match Prediction for industrial users. This department also provides training and consultancy to Academic projects.

Chemical Department is equipped with Dielectric Barrier Discharge Plasma Reactor, Ultrasonic Cleaner, Ultrasonic Probe, Tube resonator, Laboratory Pad-Dry-Cure machine with IR Pre-heater, Laboratory coating Machine, Brookfield viscometer, Planetary ball milling machine, Mixer mill machine, COD meter & reactor, Research grade meter, turbidity meter, conductivity meter.

Colour department is equipped with Bench Top Spectrophotometer (i7, X-Rite), hand held spectrophotometer (I one pro, X-rite), Colour matching software, Robotic auto Dispensing System (Colour Focus 72, Dye Focus/ Daelim Starlet), Colour viewing cabinet (Spectra LUX Jr. / Paramount), Infracolour Dyeing machine, Shaker dyeing machine, Laboratory Jigger dyeing machine and HTHP top dyeing machine.

8.0 NEW R & D PROJECTS PROPOSALS SUBMITTED TO:

8.1 MINISTRY OF TEXTILES, GOVERNMENT OF INDIA, UNDER NTTM SCHEME

- i. To Analyze and Compare properties of Erosion Control Blankets for slope protection using Geo-Textiles made from Natural biodegradable fibres such as Wool, Coir & Jute and work out cost effectiveness of such Erosion Control Blankets (ECB's).
- ii. Development of long lasting biodegradable Natural fibre based sustainable mulching material with added durability and functionality with micronutrient using needle punched nonwoven Technology.
- iii. Development of Indigenous Cost effective Hand/Motorized Knotting machine for knotting warp yarn mounted on the machines like Narrow Fabric machine, Warp Knitting Machine, Sample Weaving Loom (Power loom & Handloom)" for Development of Indigenous Machinery.

9.0 ON-GOING R & D PROJECTS

9.1 MINISTRY OF TEXTILES, GOVERNMENT OF INDIA UNDER NTTM SCHEME

- (i) "Development of eco-friendly natural fibres based sustainable agro-textiles for packaging of agro products with protection against rodents, microorganisms including bacteria, fungi and viruses and UV repellent properties".

Objectives of the Project

- i. To develop eco-friendly natural fibres based sustainable agro-packaging material for agro-products using warp knitted technology.
- ii. To develop elastic as well as non-elastic nets for agro products
- iii. Synthesis and application of microencapsulated finishes for rodent repellence, anti-microbial/anti-bacterial, UV repellent finish on the developed nets for better durability.
- iv. To validate the performance of developed fabric as per International and national standards.
- v. To conduct Field Trials of the developed natural fibre based agro packaging products & nets for the crops in different Agro-climatic zones

Abstract

Packing Materials for agro-goods are mainly in the form of nets which can be used for packaging of farm products for many end uses. Net structures are preferred because of their high strength, low weight, air permeability and cost effectiveness. Currently, Synthetic fibers such as polypropylene, polyester, Nylon etc are used for such application but they are not

bio degradable and lack of availability of synthetic raw material like Polyester, nylon, plastic chips are imported from China, Germany and other European countries makes the process import dependant. The proposed project focuses to develop cost effective and eco-friendly natural fibres based agro-textiles using warp knitted packaging material for agro-products. The natural fibers such as Indian Wool, Cotton, Hemp, Bamboo, Flax fibers etc can be used for this purpose.

Nanotechnology plays a significant role in packaging and imparts requisite properties for keeping the fruits and vegetables free from growth of microorganisms, including bacteria, fungi and viruses. Zinc, Silver, Copper Silicate (Ag, Cu, SiO₂, and ZnO) nano particles may be mixed and applied in textile materials and these nanoparticles have the property to prevent oxygen, carbon dioxide, and moisture from reaching fresh meats and others foods. The nano clay particles hinder the process of diffusion by acting as impermeable barrier and as a result of which shelf life and quality of foods are enhanced. The resulting food package is also strong, more heat-resistant and light weight, thereby reducing transportation costs. Nano particle synthesis from biological material has also enabled several applications in agriculture. Nano-biopesticides are obtained from various sources such as plants, microbes, and their derivatives provide eco friendly approach and the advantages of slower release, prevention of degradation, longer activity, and biodegradability. Neem based pesticides, *Bacillus thuringensis*, and *Trichoderma* are few examples and will be attempted. Rodents are always present in crops in low numbers, but can increase rapidly; they may cause serious problems while storing the foods and vegetables and do significant damage to these items. To address this issue, suitable rodenticides such as bittering agents, souring agents, essential microencapsulated oils & heat inducing agents such as capsaicin etc will be attempted through encapsulation technology to provide the controlled release of chemicals during the storage of such fruits and vegetables or grains items.

The agro textile products for example support nets, plant nets, leno bags, Tubular packing nets for fruit & vegetables, Nets for covering pallets, Flower and vegetable support mesh, packing sacks for vegetables, & Root ball elastic knotless nets etc. will be developed using such natural fibers with enhanced functional properties.

Progress of work

- Literature Survey and organizing the experiments is completed.
- Study of existing products for particulars application with respect to their physical parameters is ongoing.
- Development of knotless nets for the support nets is ongoing.

9.2 CENTRAL WOOL DEVELOPMENT BOARD, (CWDB)

(i) Sustainable Enhancement of Aesthetic Values of Woolens by Digital Printing

Objectives of the Proposal

- i. Developing pre-coating system for digital printing on wool for controlled absorption, minimum spreading & sharp print pattern.
- ii. Formulating Acid dye, Reactive Dye & Pigment Ink systems for digital printing on Ink-Jet Printing systems
- iii. Developing print -dry steam or print-dry-cure process as per the colourant component
- iv. Devising wash off sequence as per the ink system for fault free printing

Abstract

The project work will involve digital printing on various forms of wool irrespective of the fibre/yarn/fabric construction properties with different inks formulations containing Acid dyes, Reactive dyes as well as Pigments. The Pigment ink system is so far the unexplored area & has tremendous potential as it could be a unique system which could be applied not only on pure wool but also on popular wool blends be it polyester or other fibres.

The collaborative product/process development will involve chemical pretreatment/pre-coat formulation using the specialty chemical products. The printing ink formulations will be modified based on the expertise of printing ink manufacturer.

The product formulation will ensure use of sustainable products, application will be done to ensure runnability, speed of printing. The evaluation will be done in terms of print clarity, colour brilliancy, design sharpness, coverage area, etc. The storage stability, shelf life of the printing ink, post printing finishing to impart functional properties as per the end use requirements. Wash durability and other fastness parameters will be determined as per the stringent norms of the international test standards.

Progress of work:

- Literature Survey done
- Organizing of the experiments completed
- Industry interaction initiated
- Review Article writing is in final stages
- Machine quotation has been raised
- Carpet and other consumables purchase initiated
- Digital Printing Order placed on 24th March 2023

- (ii) **Utilization of Indian Coarse Wool as insulating Material for Building Construction as a Green Building Material and Comparison of such coarse wool based developed products against conventional materials like glass wool/rock wool.**

Objectives of the Proposal

- i. To Explore the possibility to utilize coarse Wool for Building for Insulation as Green building Material
- ii. To further Explore the possibility of coarse Wool for Building as Acoustic
- iii. Comparison of above wool based products against conventional materials like glass wool/rock wool.

Abstract

India is the 3rd largest sheep population country in the world having 65.07 million sheep producing 43.50 million kg of raw wool in 2017-18. Out of this about 85% is carpet grade wool, 5% apparel grade and remaining 10% coarse grade wool which is underutilized

This 10% coarse grade wool is in the range of 32.5 microns and above in diameter. At present, wool industry provides employment in the organised wool sector to about 12 lakh persons, with an additional 20 lakh persons associated in the sheep rearing and farming sector.

The coarse wool is not sought after because of its coarse diameter, presence of medullation, inferior quality of the product and difficulties during the processing. Though at

the cottage level, certain amount of this wool is being spun into yarn by hand spinning, it suffers with many deficiencies in terms of yarn quality and heavy droppage of 50% – 60% on the original wool reducing the yarn yield to 40% – 50%. This creates a high wastage of the fibre that is not used and destroyed resulting ecological damage and national loss. Therefore, it is Prudent to utilise such unusable coarse wool into Technical textiles Value added products such as Building Material as Insulator & acoustic in Building as a Green Building Materials.

In this proposal, it is proposed to explore the possibility to utilize coarse wool from different part of India as insulation material & acoustic for building/construction, where we can utilise wool properties such Thermal Insulation, low embodied energy, self-extinguishing which makes coarse grade wool a sustainable material option for using as insulator & acoustic for building as compared to other available products like rock-wool, glass-wool, etc.

Non wovens of different density will be prepared and prototype building model will be prepared where we can incorporate the developed wool based panels in the building and the performance study against Thermal behavior & acoustic of such developed materials will be carried out.

The study will be based on heat gain areas like: hotter region such as; Kutch and heat loss areas like colder regions across India.

The field study will also consist of building model where different commercial materials will be utilized for insulation & acoustic and a detailed comparison shall be made during field trials.

Progress of work:

- Literature Survey of existing insulation products like rock-wool, glass-wool, etc. and their performance as thermal insulators & Acoustic - ongoing
- Industry interaction initiated and attended round table conference on building insulation materials conducted by Centre of Pastoralism at Triveni Kala Sangam, Delhi
- Consumables purchased -partly
- Initial sampling of insulation material is being carried out.
- Testing of developed panel w.r.to thermal insulation properties as per ASTM D 1518 – ongoing
- Testing of developed porotype panel against moth proofing (Bio-assay)
- Mothproofing treatment to loose scoured wool fibre using (Permethrin) for durable finish
- Designing the wool based insulation panels using natural bio-degradable honeycomb structured solution, which will be ready to fit in the building

(iii) Development of sustainable and Biodegradable Mulching for Agro textiles application using Deccani wool fibre with added functionality using Plant Micronutrient.

Objectives of the Proposal

- i. Development of sustainable and biodegradable mulch for agro textiles application using deccani wool fibre.
- ii. To enhance the durability of the natural fibre based mulch by adding natural biopolymers such as chitosan, alginate and starch.
- iii. Incorporation of micronutrient in developed mulch for crop and soil enrichment.
- iv. Field trial of the developed wool fibre based mulch for selected fruit and vegetable crops to study the effect of developed Mulching material on Phenology and Agronomic Trait of the crop.
- v. To study the life span of developed mulching in terms of biodegradability and soil enrichment in comparison with the existing polyethylene based material.

Abstract

Synthetic petro-chemical based mulching films are worldwide used in agriculture to suppress weed, to reduce the loss of moisture from the soil, to preserve the plants and the edible products from the soil diseases and from the dirt. The main advantages of the plastic mulches are the decrease of the use of chemicals in weed control, the reduction of water consumption, the faster crop development, the improvement of the plants health and of the yield quality. In intensive cultivation, low density polyethylene (LDPE) mulching films are commonly used for their mechanical and thermo-optical properties, chemical and microbial degradation resistance, easy process ability and low cost. But the major drawback of these synthetic mulch mats is that at the end of their lifetime the plastic films must be removed with high cost for the growers and with environmental negative consequences connected to their collection, disposal of and recycling process.

The dramatic increase in production and lack of biodegradability of commercial polymers, particularly commodity plastics used in agriculture and packaging industry, focused public attention on a potentially huge environmental accumulation and pollution problem that could persist for centuries.

In order to develop eco-friendly alternatives to synthetic petro-chemical polymers, novel biodegradable materials need to be developed using raw materials from renewable origin. The biodegradable materials have to retain their mechanical and physical properties while in use and must be biodegradable or compostable at the end of their life, degrading via micro-organisms into carbon dioxide or methane, water and biomass.

One of the best alternatives to existing synthetic polymer is deccani wool available in Maharashtra, Telangana and Karnataka belt which is very coarse and not suitable for apparel or carpet making.

It is well documented in Literature that wool provides insulation for improved plant growth, non-woven woollen structure allows surface water penetration while reducing evaporation of moisture from the soil, and it can also hold the soil and improves erosion resistance to overland flow. The prime advantage of wool is its biodegradability and nutrient rich composition. Wool mainly comprises of amino acid material which degrades over a span of 1-5 years into nitrogen rich nutrients which ultimately enrich nutrient quality of the soil and helps in plant growth. Thicker wool mats also reduce sunlight for inhibiting weeds.

Progress of work:

- Literature Survey done
- Organizing of the experiments completed
- Industry interaction initiated
- Capex purchase done

- (iv) **Design & Development of Wool (Special fibres & blends) based Novel Denim Fabric with Multifunctional Properties such as Moisture Management, Anti-microbial etc. using Eco-friendly finishing techniques.**

Approved Objectives of the Proposal

- i. To produce Wool (Special fibres & blends) novel denim fabric by utilizing pure wool, and special yarns
- ii. To impart suitable finishing treatment such as Moisture management, anti-microbial etc. using eco-friendly finishing techniques.
- iii. To evaluate the performance of the developed denim fabric.

Abstract

As denim continues to remain one of the world's most popular fabrics, it was only a matter of time before brands began incorporating a high-performance fibre such as Indian Wool into their Denim. Denim is a twill fabric traditionally made from a dyed cotton warp yarn with an undyed weft yarn. Previous attempts were made to create wool blends in denim have used an intimate blend of wool with cotton – two fibres which are not easy to combine in a yarn. Yet by replacing some, or all, of the weft yarns with machine washable Merino wool, a higher performance and more cost effective fabric can be produced and production developments including the use of machine washable Indian Wool yarns have led to a more cost-effective way to produce Indian Wool Denim without having to intimately blend Indian Wool with cotton. Because the wool yarns being used are 100% pure, consumer's benefit from the fibre's attributes, including its natural resilience and elasticity to create new textures, drape and next-to-skin comfort, and most importantly, an increase in the level of warmth in your denim apparel.

WRA proposed to work with development partners to produce an Indian Wool/cotton denim blend which uses exactly the same warp yarn as traditional denim, but replaces some, or all, of the weft yarns with machine-washable Indian Wool. The fabrics are finished the same as traditional denim, so that without compromising denim style, all the natural benefits associated with Indian Wool and special fibers can be achieved. Special performance finishes such as moisture management, anti-microbial finishes will be imparted on the developed fabrics.

Progress of work:

- Literature Survey & Organizing the experiments work is completed
- Procurement of Existing Denim Products procurement has been completed & testing work is also completed.
- Study of existing products for particulars application with respect to their physical parameters is completed
- Industry interaction Ongoing
- Review Article writing is in Progress
- Development of Wool based non stretchable denim Fabrics is completed.
- Development of Pashmina based non stretchable denim Fabrics is completed.
- Development of Angora based non stretchable denim Fabrics is completed.
- Development of Camel based non stretchable denim Fabrics is completed.
- Trial work for Chemical modification of wool yarn for machine washability is ongoing.

(v) Development, Application and Benchmarking of Eco-friendly Moth Repellent and Moth Proofing finish for Woolen textiles.

Approved Objectives of the Proposal

- i. To develop ecofriendly moth proofing finish for woolens, the exercise is for replacing the toxic insecticides to provide a safer moth proofing agent to the wool processors.
- ii. To give treatment of developed moth proofing finish on woolens. The evaluation would involve the testing for moth resistance against the potential moth species to determine the minimum effective concentration.
- iii. Studies on the fastness properties, wet fastness and fastness to dry cleaning would be carried out to determine the permanency of the treatment.
- iv. To do benchmarking of developed product

Abstract

Wool is one of the most ancient and highly preferred fibers to mankind and is extremely susceptible to insect infestation which is a major concern to the woolens and is an age-old issue. Woolens, stored in a poorly ventilated, dark, and humid atmosphere are prone to the moth attack. The larvae of clothes moth and carpet beetle severely attack woolens and animal fibers. While chemical anti-moth formulations are effective in preventing the moth attack, their toxicity is also a major concern. Herbal formulations, including natural dyes, are found to be effective in repelling the moth. It has become the need of the hour to popularize herbal mothproofing agents for effective management of these textile pests. Recently nano chemicals are also attempted for moth repellency. This project plans to study various insects attacking wool, their management, natural and synthetic anti-moth agents along with anti-feedants, their mode of action, and standard testing methods, benchmarking with commercially available chemical moth proofing agents.

Progress of work:

- Literature Survey done
- Organizing of the experiments completed
- Industry interaction initiated
- Capex purchase done

9.3 NATIONAL JUTE BOARD (NJB), GOVT. OF INDIA

(i) Development of Cost Effective Handmade Carpets & Floor Coverings, Home Furnishings & Knitwears using Jute (Treated Woolenised or Untreated) & other natural fibers with value added Eco Friendly Finishes such as with Flame Retardancy, Mosquito Repellent, Anti-Bacterial /Antimicrobial Properties etc.

Objectives of the Proposal

- i. To develop woven/knitted fabrics (union blends or otherwise) using Jute (treated woolenised or untreated) with other natural fibers for home furnishings, handmade carpets and floor coverings.
- ii. To impart value added multi-functional and ecofriendly finishing such as Flame Retardancy, Mosquito Repellence, and Anti-Bacterial/Antimicrobial Properties, etc on the developed product for Floor coverings, home furnishings & Knitwears application as per requirement.
- iii. To study and evaluate the performance of the different developed products
- iv. To study the techno commercial feasibility of the developed products

Abstract

The present proposed project to develop cost effective handmade carpets and floor coverings is in line to the work carried out in the past on woolenization and softening of jute fibers. Handmade carpets and floor coverings will be developed using Jute (treated woolenised or untreated) & other natural fibers along with value added finishes such as aroma finishing, anti microbial finishing, Flame retardancy for Indian carpet industry.

The objective of the project is to exploit jute's strength and woolenising property for producing high value added products like Handmade carpets and floor coverings & for Homotech applications i.e. home furnishings and upholstery & knitwear's as well as utilizing warp knitting technology for developing different jute based fabrics. These will have techno-economic Feasibility and will have good market potential. Utilisation of jute will increase scope for producing these diversified jute products. The present proposed project is to further utilize the jute material in Homotech segment of technical textiles and to develop warp knitted fabrics using Raschel warp knitting technology as well as knitweaves with value added finishes.

Progress of work:**Work Completed/Ongoing at Bhadohi Cluster****Vishal Carpets, Bhadohi**

- Development of Hand Made Shaggy Carpets from Wool/Jute yarn at VC Vishal Carpets, Bhadohi
- Development of Hand Tufted/Knotted Carpets from Wool/Jute yarn at VC Vishal Carpets, Bhadohi
- Spinning of Intimate Blends of Wool/Jute yarn at VC Vishal Carpets, Bhadohi in different Blends in the proportions

Azaz Carpets, Bhadohi

- Development of Handmade Tufted Carpets from Wool/Jute yarn, Bamboo and Banana yarn in blend proportion of 40/30/30.

Handmade Tufted Carpets from Wool/Jute yarn, Bamboo and Banana yarn in blend proportion of 40/30/30.

- Development of Hand Made Knotted Carpets from Dyed handspun/Millspun Wool/Jute yarn (Ongoing)
- Development of Handloom Carpets from Hand spun Jute/Bamboo yarn (Ongoing)
- Development of Home Furnishing Products (such as Cushion Cover, Curtain, throws) from jute and Natural fibers yarn at M H Khan Exports, Panipat, Haryana. (Ongoing)

Yarn Spinning Work Completed at Bikaner

Total of 150 kgs of yarn spinning of Intimate Blends of Wool/Jute yarn at Navaratanmal Ashok Kumar Surana Woollen Pvt. Ltd., Bikaner in 05 different Blends is completed in the proportions as mentioned below:

- Material - Nz Wool & Treated Jute
- Blend – 25/75, 40/60, 50/50, 60/40, 75/25
- Count – 2/ 5 Nm – 2/3 Nm
- Industry Involved : Global Woollen Industries, Bikaner

Development of Eco Friendly Finishes at M/S Innoleague Technologies India Pvt. Ltd., Mumbai

Development of Eco Friendly Finishes such as with Mosquito Repellent, Anti Bacterial /Antimicrobial Properties, Flame Retardancy etc. at M/S Innoleague Technologies India Pvt. Ltd., Mumbai. Completed microencapsulation trials for 11 types of essential oils includes Citronella Oil, Eucalyptus Oil, Lemongrass Oil, Cedar wood Oil, Basil Oil, Eucalyptus Citodora Oils, Lavandin Oil Grasso, Spearmint Oil, Clove Oil, Thyme Oil & Pepper Mint Oil.

Work Completed/ongoing for Travancore Mats, Kerala

Trials Completed

1. Woolenization, Softening of Jute Yarn
2. Woolenization of Sisal Fiber & Yarn
3. Softening of Coir Yarn & Fibers

Woolenization of Jute yarn trials are completed at Travancore Mats, Kerala in the month of April 2023

- 30 kgs of jute Yarn Woollenization (Natural Colour)
- Which includes Undyed HS Jute Yarn + 96 lbs 02 ply Jute yarn + 28 lbs 5 ply Jute yarn
- Woolenization of Pigment Dyed Yarn by Spary method
- Woolenization of Pigment Dyed flat woven carpets
- Softening of Pigment Dyed Yarn by Spary method
- Softening of Pigment Dyed flat woven carpets

Work Completed/ongoing at Carpet Training & Production Center, Pombhurna, Chandrapur Distt., Maharashtra)

Development of Hand Knotted Carpets & Hand Woven Carpets (Industry Associated – Carpet Training & Production Center, Pombhurna, Chandrapur Distt., Maharashtra)

Development of Hand Knotted Carpets (6/36 Quality)

1. 100% Jute (Design 1) (Size : 20 x24 inch²)
2. 100% Jute (Design 2) (Size : 20 x24 inch²)
3. 70% Jute & 30% Wool (Size : 20 x24 inch²)
4. 60% Jute & 40% Wool (Size : 20 x24 inch²)
5. 50% Jute & 50% Wool (Size : 20 x24 inch²)

Development of Hand Tufted Carpets (05 kg Quality)

1. 100% Jute (Size : 18 x24 inch²)
2. 85% Jute & 15% Wool (Size : 18 x24 inch²)
3. 70% Jute & 30% Wool (Size : 13 x22 inch²)
4. 75% Jute & 25 % Wool (Size : 18 x24 inch²)
5. 50% Jute & 50% Wool (Size : 18 x24 inch²)

Ongoing Work

Development of Handmade Carpets from Jute & Natural Fibers Blends as mentioned below:

- Jute/ Banana
- Jute/ Alpaca
- Jute/ Coir
- Jute/ Sisal
- Jute/Hemp

Development of Home Furnishing Fabrics are ongoing from Jute in blends with the Other Natural Fibers Yarn at M/s SV Textiles Bhiwandi and are mentioned as below:

1. Jute yarn 4.8 lbs/spindle
2. Linen/viscose (45/55) 06Ne
3. Wool yarn (2/28 Nm)
4. Linen/Polyester (55/ 45) 06 Ne
5. Hemp/ Cotton 70/30 06 Ne

Development of Home Furnishing Fabrics are ongoing from Jute in blends with the Other Natural Fibers Yarn at M/s Maa Sipra Creation, Ranaghat, West Bengal

Development of Knitted Products such as Scarf, Muller, etc. using Woolenized, Bleached & Softened Jute + Wool Yarn (50/50 WOOL/WOOLENIZED JUTE BLENDS).

10.0 COMPLETED R&D PROJECTS

10.1 MINISTRY OF TEXTILES

i. Design and development of light weight and high impact resistance sports goods.

- **Approved Objectives of the Proposal**
 - Development of low weight, high efficient cricket gears
 - To evaluate the performance of player using the developed products
- **Salient Research Achievements**

Project activities/deliverables	Achievement
Development of Non-Newtonian fluid sheets	A detail literature survey and experiment planning has been carried out. From literature survey and analysis of commercially available samples path for development of Non-Newtonian fluid sheets was found
Preparation of New Cricket pad	Based on extensive study, Commercially available Cricket Pad, thigh pad, arm guard samples have been procured and analyzed for their physical parameters. Parameter evaluation data was used for the development of light weight cricket goods such as Cricket Pad, thigh pad and arm guard samples.
Testing of cricket pad	Commercially available Cricket Pad, thigh pad, arm guard samples were tested for weight, length width, thickness and dimensions. Tensile and Tear Strength of inner and out materials used.
Development of other cricket gears like Thigh Pad, Arm guard	The development of light weight cricket goods. Thigh pad and arm guard samples were developed using light weight material.
Testing of developed products	Performance Evaluation of developed sports goods has been carried out. Samples developed such Cricket Pad, Thigh Guard and arm guard were tested for weight, length width, thickness and dimensions. Tensile and Tear Strength of inner and out materials used.
Field trial/ Result Analysis/Report	Field trial, result evaluation and report writing has been completed

ii. **Design and Development of sportswear and sports accessories having Thermo Physiological Comfort properties in order to enhance the performance assessed by using a Sweating Thermal Manikin system under different environmental conditions**

• **Approved Objectives of the Proposal**

- Designing and Development of sportswear and sports accessories having Thermo Physiological Comfort properties by assessing the performance using Sweating Thermal Manikin under different environmental conditions.
- Study and analysis of data gathered by human field trial vis-s-vis Sweating Thermal Manikin under different environmental conditions.

• **Salient Research Achievements**

Project activities/deliverables	Achievement
Development of sportswear with optimized blending of PET/ regenerated cellulosic fibres	Developed fabrics suitable fabrics for active sports having better Thermo Physiological Comfort properties than existing sportswear in order to enhance the performance of athletes. The developed fabrics were tested at WRA lab against functional properties such as ❖ Moisture management, ❖ Drying rate, ❖ Peak heat flux Qmax-thermal conductivity, ❖ water vapour transmission rate, ❖ thermal insulation- dry guarded hot plate, ❖ air permeability, ❖ sweating thermal manikin etc. Based on the test results, optimization of developed sportswear has been successfully been carried out.
Preparation of cellulosic microparticles particles	Various methods are explored for extraction of Micro-cellulose such as acid hydrolysis, milling and steam explosion.
Application of Micro-cellulose particles on Polyester, PET/ regenerated cellulosic fibres blend	Cellulosic microparticles are applied on developed Polyester, PET/regenerated cellulosic fibres blend using different methods. In One method utilises direct Binding Cellulosic microparticles particles to the surface of fabric by crosslinking agent. Another method is Application of Cellulosic microparticles by using LiCl + Silane Ethanol system.
Testing and evaluation of developed fabric	Moisture management properties, drying rate, Peak heat flux Qmax- thermal conductivity, wicking height absorbency of polyester and PET/regenerated cellulosic fibres blend treated with cellulosic microparticles by various

Project activities/deliverables	Achievement
	methods as well as commercial finishing agent has been tested and it is observed that Both PET and PET/regenerated cellulosic fibres blend treated with Silane + cellulosic microparticles Solution shows better results in terms of moisture management properties compared to other two methods. Obtained results are comparable with commercial available items.
Preparation of garment	After optimization of Silane+ cellulosic microparticles application method, PET and PET/regenerated cellulosic fibres blend fabric developed under the project has been treated with the Silane+ cellulosic microparticles method. Resulted sports garment shows better moisture management properties compared to untreated fabric and results are comparable with commercial sports garment.
Evaluation of garments at Sweating thermal Manikin	The final garments were tested at sweating thermal manikin for evaluation of their comfort properties.

11.0 REVENUE GENERATING ACTIVITIES

Revenue for Year 2022-2023	
Description	Rs. in Lacs
Textile Testing Laboratory & Eco Lab	422.73
Incubation Activities	18.34
MAVIM	76.44
Consultancy & Training	8.34

12.0 MAJOR ASSIGNMENTS UNDERTAKEN

I. Memorandum of Understanding (MOU) signed between WRA & Industries/ Institutions etc:

- MSME-Technology Development Centre (PPDC) Meerut: Initial step for collaborative working is signing of MOU for Exchange of testing , Training and other facilities.
- ICAR-National Institute of Natural Fibre Engineering and Technology, Kolkata : Initial step for collaborative working is signing of MOU for Exchange of Research work idea's, Student , Faculty , testing , Training and other facilities.
- Institute of Chemical Technology (ICT), Textile Department of ICT, Matunga signed MOU on 14th July 2022.



WRA (Wool Research Association) is in Process of signing a MOU with

- Dr. B R. Ambedkar, National Institute of Technology, (NIT) Jalandhar : Initial step for collaborative working is signing of MOU for Exchange of Research work idea's, Student , Faculty , testing , Training and other facilities

II. Consultancy:

- Ongoing Consultancy for establishing Pashmina Dehairing Plant Leh.
- KVIC Consultancy for Development of Pashmina Wool Project at Leh

Consultancy Proposals in Pipeline:

- WRA has submitted Consultancy Proposal and Draft MOU to Bihar Patna Govt. for Technical assistance in the Proposal to be submitted to Central Wool Development Board under IWDP Scheme to establish two Common Facility Centre (CFC's) at two places Sasaram (Rotas) and Tekari (Gaya)
- WRA has initiated communication with Team of Agni Mission. AGNi is one of the nine missions under the Prime Minister's Science, Technology, and Innovation Advisory Council, working under the aegis of the Office of the Principal Scientific Adviser (PSA), Government of India. The Mission is executed at Invest India, the National Investment Promotion and Facilitation Agency. WRA and AGNi Mission Technology for dyeing and carding of Pashmina & wool in Kashmir region.

III. Incubation Services rendered

- WRA has developed anti-microbial middle layer for face mask which is being commercialised and repeat order for bulk Prototype developments are ongoing. Repeat order also for developed flame retardant PBI fabric for the industry is ongoing.
- Work on Two (02) Knitting Machines namely Tricot Warp Knitting Machine & Raschel Warp Knitting Machine are ongoing for the industry under COE-Sportech.
- WRA has developed 10 GSM Knotless Nets for Sports and Agro Textiles from HDPE Monofilament UV repellent yarn (0.13 mm thickness) which is being commercialized and discussion for scheduling bulk trials are ongoing.
- WRA has developed Elastic Stretchable Warp Knitted Fabric for Sports Application.
- COE has developed a Knitted Design using 100% Wool Yarn for Application in Toys (Doll Hair).
- COE has developed knitted fabrics such as Hexagonal nets, Square nets, 2 way stretchable fabric utilizing using 100% DREF PP yarn (2/15 Nm count).
- Developed Tubular nets for Garware Technical Fibers Ltd. Oil Boom Applications.
- Developed Stretchable fabric for Vissco Rehabilitation Aids Pvt Ltd.
- Developed fabric for Polyester fabric for Home Furnishings Application for Nebco Textiles.

IV. Training to Industry :

WRA in Association with Govt. Of Maharashtra (Through its entity MAVIM), is successfully running Hand Made Carpet Production cum training centre at Two (02) centres at Pombhurna & Mul taluka, Distt. Chandrapur, where around 120 nos. of women have been trained and working with Centre to earn their wages through commercial production of exportable Hand-Made carpet manufacturing activities. The objective of above setup is to skill the manpower from rural background in Hand made carpet manufacturing and to augment their family income by providing earning opportunity at their door step to prevent migration and improve their livelihood.

On the ground of Success of Previously set up Carpet Production cum Training centres at Pombhurna & Mul taluka, Distt. Chandrapur. WRA has additionally proposed three (03) Nos. of New Carpet Training cum Production Centres at Brahmपुरi, Saoli & Sindebai Taluka at Distt. Chandrapur to train 240 women. All three Projects have been sanctioned out of which two (02) centres i.e. Brahmपुरi & Saoli Dist. Chandrapur, Maharashtra are now operational

V. Conference /Seminar:

Technotex 2023 - 24th February 2023

Technotex 2023 Concluded at Bombay Exhibition Centre 22.02.23 to 24.02.23. Honorable Minister of State for Textiles, Ministry of Textiles, Govt. Of India Smt. Darshana Vikram Jardosh and Smt. Rachna Shah, Union Secretary of Textiles visited WRA CoE Sportech stall and interacted with officials.

Technotex 2023: Envisioning Indian Technical Textiles @2047', the 10th International Exhibition and Conference on Technical Textiles, was inaugurated by Union Minister of State for Textiles Smt. Darshana Jardosh at Bombay Exhibition Centre in Goregaon, Mumbai today. Technotex, organized by the Union Ministry of Textiles and Federation of Indian Chambers of Commerce & Industry (FICCI), is a flagship event comprising buyer-seller meet, an international exhibition and conference. The three-day event being held during February 22 – 24 will provide a common platform for interaction amongst stakeholders from across the global technical textile value chain.

Union Minister Smt. Darshana Jardosh also launched an e-book on Technical Textiles titled 'Technical Textiles Ecosystem in India: Market Overview, Inherent Linkages and Growth Opportunities' on the occasion.

Addressing industry representatives and other stakeholders, the Union Minister of State for Textiles Smt. Darshana Jardosh said that the future of the textile sector is closely linked with the growth of the technical textile industry. The Minister observed that as the global technical textile industry continues to grow, India is poised to benefit from the expansion.





- Dr. Smita Bait Presented a Research paper on "Development of Sustainable Waterproof Breathable fabric for Application in Sportech and Meditech" at 34th National Convention of Textile Engineers & Seminar on "Innovative Textile Materials" during 10-11 September 2022 Organized by Institution of Engineers, Kanpur Local Centre at Outreach Auditorium, IIT Kanpur.



- Dr. Smita Bait, Deputy Director represented WRA and presented the research findings on Development of Sustainable Waterproof Breathable Fabric for Applications in Sportech and Meditech at Research Conclave on 'Indigenous Technology Development for Specialty Textiles' dated 01st June 2022 at VJTI-Mumbai organized by VJTI, Textile Manufactures Department, in association with INDIAITME Society.
- Mr. Shishir Tyagi, presented the WRA's developmental work in SPORTECH area in SDC seminar on versatility textile & Fashion in Sportech - Get into the smart & direct mode - at SGTPA, Surat on 28th May 2022.



- Dr. Smita Bait, Deputy Director, presented a power point presentation on Gap Analysis & Requirements- Sportech during the webinar on “Sportech - The future of Sport Textile & accessories Industry in India” organized by WRA, ITTA & Archroma on 13th July 2022.



- Mayur Basuk, presented a research paper on “Study of Thermo Physiological Comfort Properties of Modal & Blended Fabric” at 34th National Convention of Textile Engineers & Seminar on “Innovative Textile Materials” during 10-11 September 2022 Organized by Institution of Engineers, Kanpur Local Centre at Outreach Auditorium, IIT Kanpur



- Mr. Mayur Basuk, Deputy Director delivered a Guest Lecture on Sportswear & Knitting Technology on 19th October, 2022 at National Institute Of Fashion Technology (NIFT) Mumbai
- **SDC EC Seminar on “Brand Tirupur: Broadening the Value Horizons in Apparel” 30th Sept 2022, at Hotel Gokulam Park, Coimbatore**

The Society of Dyers and Colourists (SDC) Education Charity (EC) had organized a Seminar on “Brand Tirupur: Broadening the Value Horizons in Apparel” on 30th September 2022, at Gokulam Park Hotel, Coimbatore.

Dr. Mrinal Choudhari, Joint Director Wool Research Association (WRA) delivered lecture on SPORTECH. During presentation Dr. Mrinal Choudhari, Joint Director Wool Research Association (WRA), COE - Sportech explained the Classification of Sportech (sportswear, sports goods and sports accessories), World and India Market of Sportech, Sportswear - sportswear design & production of sports Apparel, Sports Goods and Sports Accessories, ideal properties from sportswear, global sports and active wear facts and figures and market dominance with a detail coverage of the Indian sportswear scenario. She further explained

different fiber properties, evaluation on performance characteristics of sport textiles, ECWCS, testing facility for garments, evaporative cooling jacket, active heating system based sleeping bag, National linkages of WRA, Gaps and Requirements and Product development facilities available to strengthen the Tirupur Textile and Apparel sector



13.0 PAPERS PRESENTED/PUBLISHED & PATENTS APPLIED

During the year 2022-23 following Article/ write up were published by technical staff of WRA.

1. Smita Bait, Suvidha Shinde, Ravindra Adivarekar & Nagaiyan Sekar, ESIPT Core Containing Benzothiazole and Benzimidazole Based Fluorescent Acid Azo Dyes for Protein Fiber: Synthesis, Spectral Characteristics, and Fastness Evaluation, POLYCYCLIC AROMATIC COMPOUNDS <https://doi.org/10.1080/10406638.2022.2061534>, Published on 12 Apr 2022.
2. Development of Sustainable Waterproof Breathable Fabric for applications in Sportech and Meditech, 34th National Convention of textile Engineers and national Conference, on Innovative Textile Materials, September 10-11, 2022, Page No. 106-116, Organised by IIT Kanpur.
3. Mayur Basuk, Smita Bait, R V Adivarekar, "Study of Thermo Physiological Comfort Properties of Modal & Blended Fabric" Proceedings of Book of Papers, 34th National Convention and Seminar on "Innovation Textile Materials" organised by The Institution of Engineers (India), Kanpur Local centre at Outreach Auditorium, IIT- Kanpur, 10-11th September 2022.
4. Mayur Basuk, Dr. Suman Deepak Mundkur & Dr. R. V. Adivarekar, Recycling of Carpets & Woollen Textiles, Colourage, Oct. 22, page 28 -31.
5. Mayur Basuk, Shishir Tyagi, K.K. Misra, Pradeep Kulshrestha, Textile Reinforced Concrete Composite Material & Pultrusion Products for Modular Houses" Textile Value Chain, Vol. 10, issue 11 November 22, page 75-77.
6. Mayur Basuk, Dr. R. V. Adivarekar, Eco Friendly & Sustainable fibers for Sportech, Chemical Fibers International, Nov 22, page 188.
7. Mayur Basuk, Dr. R. V. Adivarekar, Sweating Thermal Manikin System for Evaluation of Thermal & Moisture Comfort of Sportswear: A Critical Review "the Asian Textile Journal, Jan-Feb 2023, pp 21-23.

BOOK CHAPTER PUBLISHED

- Mayur Basuk, Dr. R. V. Adivarekar, published a Chapter namely Improving the Performance of Human Body with Far Infra-Red Rays Reflecting Textiles in the Book name: **Research Development in Science and Technology**

PATENTS:

- Wool Research Association has filed complete specification for the Patent “Light weight and high impact resistance sports goods”. Complete Specifications were filled along with request for examination dated 16th February, 2023.
- Wool Research Association has filed complete specification for the Patent “Sportswear with enhanced Thermo Physiological Comfort properties”. Complete Specifications were filled along with request for examination dated 21st March 2023.
- Wool Research Association has filed patent for “Development of Novel Detergent Formulation for Wool with immobilized enzymes for enhancing machine wash ability of wool fabric”. Patent application is under evaluation, as per requirements of patent office details has been submitted application for approval for National Biodiversity Authority approval dated 12-05-2022. Queries raised has been replied for Examination report on 14-05-2022.

14.0 MEETINGS ATTENDED:**Shri. K.K. Misra, Director (Officiating) & C.O.O., WRA**

- Attended VC meeting on 11th April, 2022 of Working Group for Sustainability Strategies in responsible Textile Production (Phase I)
- Attended VC meeting on Carpet wool stakeholders interactive meet entitled “Challenges in carpet wool harvesting, marketing and utilization of coarse wool in carpet yarn manufacturing” at ICAR- CSWRI, ARC, Bikaner in collaboration with CWDB, Jodhpur on 23rd April, 2022 at 10.30 a.m.
- Attended VC meeting of Central Wool Development Board on 12th May, 2022 with all State/UT/Central Governments Organizations and all concerned Stakeholders to help them in preparation of new project proposals under different components of Integrated Wool Development Programme (IWDP).
- Attended VC meeting on 13th May, 2022 of Working Group for Sustainability Strategies in responsible Textile Production (Phase II) under the Chairmanship of Joint Textile Commissioner to discuss the line of action for the identified projects for commercialization.
- Attended VC meeting of 40th Governing Body of Central Wool Development Board on 24th May, 2022.
- Attended VC meeting on 06th June, 2022 of Working Group for Sustainability Strategies in responsible Textile Production (Phase II) under the Chairmanship of Joint Textile Commissioner to discuss the line of action for the identified projects for commercialization
- Attended VC meeting on 14th June, 2022 for interaction with Technology Development Board (TBD) Officers in the Office of the Textile Commissioner.
- Attended VC meeting on 22nd June, 2022 for Action Plan for setting up of World Class Quality Conformity Assessment Eco-System
- Attended VC meeting on 06th July, 2022 for Implementation of Circular Economy in Textile Sector.

- Attended VC meeting on 25th July, 2022 with M/s R.K. Sports.
- Attended First Steering Committee Meeting of Technotex 2023 on 01st August, 2022
- Attended VC Third Stakeholder meeting on 02nd August, 2022 for Setting Goals for Plant Based Foods Industry Association (PBFIA).
- Attended Three Meetings on 25th August, 2022 :
 - Review of PM Action Taken Report - Textiles @ Krishi Bhawan from 4:30 PM - 6:00 PM
 - Restructuring of Textile Commissioner's Office @ Vanijya Bhawan from 6:45 PM - 7:30 PM
 - Proposal for Merger of DC Handloom & DC Handicrafts @ Vanijya Bhawan from 7:30 PM - 8:15 PM.
- Attended 12th Annual General Meeting of the members of the Indian Technical Textile Association on Wednesday, the 28th September 2022 at 3.00 PM in the Chancery I, Orchid Hotel, Vile Parle, Mumbai.
- Attended VC Brainstorming Session on Strengthening Skilling and Training Ecosystem for Technical Textiles Sector" on 12th September, 2022.
- Attended two days Wool Stakeholders Meeting/Conference on Challenges and development through augmentation of different segments and use of technology on 23rd & 24th September, 2022 at Clarion Bella Casa Hotel, Jaipur.
- Attended VC meeting on 07th October, 2022 Hon'ble CIM's meeting with EPCs.
- Attended meeting of Hon'ble Minister of Textiles with all the Textile Research Associations (TRAs) on 03rd November, 2022 at Vanijya Bhawan, New Delhi (in physical mode), wherein TRAs would apprise the Hon'ble Minister of Textiles regarding the overview of the activities undertaken by them.
- Attended VC Meeting under the Chairmanship of Shri Rajeev Saxena, Joint Secretary on 12th December 2022 regarding Rationalisation, restructuring and merger of TRAs.
- Attended VC Meeting on 09th January, 2023 of Stakeholders' consultation meeting on Quality Control Order for cotton bales.
- Attended Stakeholders consultative VC Meeting for taking up inputs / comments / suggestions on the General Guidelines of Grant for Research & Entrepreneurship across Aspiring Innovators in Technical Textiles (GREAT) under the chairmanship of Shri Rajeev Saxena, Joint Secretary on 19th January 2023
- Attended Second Meeting of Steering Committee on Technotex 2023 under the Chairmanship of Secretary Ministry of Textiles on 30th January, 2023.
- Attended VC 15th Project Appraisal & Monitoring Committee (PAMC) meeting on 08th February, 2023 under Scheme for Research and Development for the Textiles Industry including Jute for a period of five years from 2014-15 to 2018-19 extended further upto 31/3/2023 to deliberate all the ongoing and completed projects.
- Attended meeting on 23rd February, 2023 for evaluation of Testing Infrastructure Gaps of TRAs at the venue of Technotex, Bombay Exhibition Centre, Goregaon, Mumbai.
- Attended VC Meeting of 1st Indo-Australian Joint Working Group on 22nd March, 2023.

Dr. Mrinal Choudhari, Joint Director, WRA

- Attended the meeting for Sportech Conference planning and other strategic discussions with chairman ITTA Shri Amit Agarwal and Archroma Team Shri Anjani Prasad, Shri Sanjay Sathe and Shri Alex Dhanadurai at WRA's CoE Sportech on 13th April 2022.
- Attended 3rd Meeting of BIS Expert Panel on Sportech (TXD 37) held on 11th April 2022 at 3.00 PM thru video conferencing
- Attended 4th Meeting of BIS Expert Panel on Sportech (TXD 37) held on 25th April 2022 at 3.00 PM thru video conferencing
- Attended 5th MEETING of BIS Expert Panel on Sportech (TXD 37) held on 10th May 2022 at 3 pm May 10, 2022 03:00 PM Virtual Mode.

- Attended free Webinar on Sportswear and Knitting Technology on 21st June, 2022 organised by Maharashtra Centre for Entrepreneurship Development (MCED).
- Participated in Yoga by the Bay, at Marine drive Mumbai on the occasion of International Day of Yoga on 21st June 2022 organised by MOT, GOI.
- Attended International Convention and Exhibition on Soaps, Detergents, Cosmetics and Ingredient's (ISDC 2022) - Home and Personal Care Products and Ingredients held on July 10-12, 2022 at Goa.
- Attended Webinar on Sportech – The future of sports textiles and accessories industry in India on 13th July 2022 through the virtual platform.
- Visited Institute of Chemical Technology (ICT) for Signing of MOU between Wool Research Association (WRA) and Textile Department of ICT, Matunga on 14th July 2022.
- Attended the meeting with Shri Pradeep Kulshrestha, Plant Head, United Fiber Composite Pvt. Ltd., Ahmedabad who visited WRA CoE Sportech on 1st August 2022 and shared his hands on practical experience and knowledge with the team.
- Attended meeting with Ms. Savita Lopez, Assistant Professor of SVT College of Home Science, SNDT Women's University, Juhu, Mumbai who visited Wool Research Association along with students on 17.09.22.
- Attended Meeting with the Team from the state government of NSW, Australia & Planet Protector Packaging who visited WRA to explore opportunities to work on the collaborative projects on 17th September 2022.
- Delivered Lecture on Brand Tirupur: Broadening the Value Horizons in Apparel on 30th September 2022 at Gokulam Park Hotel Coimbatore organized by Society of Dyers and Colourist (SDC EC) India unit.
- Attended International Conference on “Digitalization – A Step Towards Textile 4.0”, Friday, 14th October 2022, Hotel The Lalit Mumbai
- Visited Meerut for MOU signing between Wool Research Association and MSME Technology Development Centre Process cum Product Development Centre (PPDC), Meerut, Under Ministry of Micro, Small & Medium Enterprises, Government of India on 10th November 2022.
- Attended two days' workshop at IIT Delhi on - Technical Textiles for Protection Against Industrial Hazards on 2 and 3rd December 2022
- Attended Two-day Textiles Conclave by Ministry of Textiles, Government of India held on 14-15 December, 2022 at Varanasi, Uttar Pradesh
- Attended meeting for State Textile Policy held on 20th January 2023 at Regional Deputy Commissioner's office, New Administrative Building Civil Line Nagpur Maharashtra
- Attended Technotex 2023 held at Bombay Exhibition Centre from 22.02.23 to 24.02.23, where WRA had the stall for COE-SPORTECH
- Visited MSME Technology Development Centre Process cum Product Development Centre (PPDC), Meerut for Development and Testing of Light Weight Cricket Pad and its testing under MOT's R & D Project during 27th and 28th February 2023
- Attended Online meeting for State Textile Policy organized by Nagpur Regional Textile Commissioner's office on 8th March 2023 at 4pm
- Attended 6th Meeting of Technical Textiles for Sportech Applications Sectional Committee, TXD 37 online mode on Tuesday, 28 March, 2023, at 11:00 AM by Virtual Mode.

Mr. Mayur Basuk, Deputy Director, WRA

- Attended meeting with (in VC mode) on 22nd June 2022 regarding Action Plan for setting up of World Class Quality Conformity Assessment Eco-system organized by Textile Committee.
- Attended WRA's 156th GC Meeting held on 29th June 2022 at WRA.
- Attended the meeting for sportech strategic initiatives and nailing down Indian market

- opportunities and survey to filter bigger goal in presence of chairman ITTA Shri Amit Agarwal and Archroma Team Shri. Anjani Prasad, Shri Sanjay Sathe and Shri Alex Dhanadurai at WRA's CoE Sportech on 13th April 2022.
- Attended SDC seminar on versatility textile & Fashion in Sportech - Get into the smart & direct mode - at SGTPA, Surat on 28th May 2022.
 - Participated in Yoga by the Bay, at Marine drive Mumbai on the occasion of International Day of Yoga on 21st June 2022 organised by Ministry of Textiles, Government of India.
 - Attended Webinar on Sportech – The future of sports textiles and accessories industry in India on 13th July 2022 through the virtual platform.
 - Attended the meeting with Shri Pradeep Kulshrestha, Plant Head, United Fiber Composite Pvt. Ltd., Ahmedabad who visited WRA CoE Sportech on 1st August 2022 and shared his hands on practical experience and knowledge with the team.
 - Attended meeting with Ms. Savita Lopez, Assistant professor of SVT College of Home Science, SNDT Women's University, Juhu Mumbai who visited Wool Research Association along with students on 17.09.22.
 - Attended Meeting with the Team from the State Government of NSW, Australia & Planet Protector Packaging who visited WRA to explore opportunities to work on the collaborative projects on 17th September 2022.
 - Attended International e-Conference on Textiles for Advanced Technologies (TextileTech-2022) on 12-13 Nov 2022.
 - Visited Vishal Carpets, Bhadohi for the project work in April 2022
 - Visited & attended 34th National Convention and Seminar on “Innovation Textile Materials” organised by The Institution of Engineers (India), Kanpur Local centre at Outreach Auditorium, IIT- Kanpur, 10-11th September 2022.
 - Attended 04th MISSION STEERING GROUP (MSG) meeting held on 01st November 2022 under the chairmanship of Union Minister of Commerce and Industry, Consumer Affairs, Food and Public Distribution and Textiles, Shri Piyush Goyal at Vanjiya Bhawan, New Delhi.
 - Attended Project Review meeting of ongoing R&D project at National Jute Board, Kolkata on 07.11.2022
 - Visited Linen and Worsted plant at Jayashree Textiles, Rishra, West Bengal and discussed the project work requirements.
 - Visited Jute Sacks and Hessian Fabric Manufacturing plant H. C. Jute Mills, West Bengal and discussed the project work requirements.
 - Visited the Institute of Jute Technology (IJT), Kolkata.
 - Visited the Pilot facilities of ICAR-National Institute of Natural Fibre Engineering and Technology (NINFET) and discussed the collaboration possibilities with WRA.
 - Visited Apurva Texmac, Bhiwandi for formulation of the new research project on machine designing in Nov 22.
 - Visited Global Tex, Bhiwandi for development of jute based home furnishing fabrics for project work in Nov 22.

Mr. Shishir Tyagi, Deputy Director, WRA

- Attended meeting with Carpet manufacturers and Exporters on 13-14 April 2023 for Marketing of Carpet produced at Carpet training cum Production centre at Distt. Chandrapur.
- Attended Meeting with TRADC (a unit of Aditya Birla), Kharch Personnels (in VC Mode) for Joint developmental work of sports dresses suitable for Indian Athletes for Tropical environment conditions.
- Attended free Webinar on Sportswear and Knitting Technology on 21st June, 2022 organised by Maharashtra Centre for Entrepreneurship Development (MCED).
- Attended meeting with (in VC mode) on 22nd June 2022 regarding Action Plan for setting up

of World Class Quality Conformity Assessment Eco-system organized by Textile Committee.

- Attended WRA's 156th GC Meeting held on 29th June 2022 at WRA.
- Attended Meeting with M/s R.K.Sports on 25th July 2022 regarding joint developmental work.
- Attended the meeting for sportech strategic initiatives and nailing down Indian market opportunities and survey to filter bigger goal in presence of chairman ITTA Shri Amit Agarwal and Archroma Team Shri.Anjani Prasad, Shri Sanjay Sathe and Shri Alex Dhanadurai at WRA's CoE Sportech on 13th April 2022.
- Participated in Yoga by the Bay, at Marine drive Mumbai on the occasion of International Day of Yoga on 21st June 2022 organised by Ministry of Textiles, Government of India.
- Attended Webinar on Sportech – The future of sports textiles and accessories industry in India on 13th July 2022 through the virtual platform.
- Attended the meeting with Shri Pradeep Kulshrestha, Plant Head, United Fiber Composite Pvt. Ltd., Ahmedabad who visited WRA COE Sportech on 1st August 2022 and shared his hands on practical experience and knowledge with the team.
- Attended meeting with Ms. Savita Lopez, Assistant professor of SVT College of Home Science, SNDT Women's University, Juhu Mumbai who visited Wool Research Association along with students on 17.09.22.
- Attended Meeting with the Team from the State Government of NSW, Australia & Planet Protector Packaging who visited WRA to explore opportunities to work on the collaborative projects on 17th September 2022.
- Attended Review Meeting of Textile Research Associations (TRA) under the chairmanship of Union Minister of Commerce and Industry, Consumer Affairs, Food and Public Distribution and Textiles, Shri Piyush Goyal on 3rd November 2022 in New Delhi.
- Visited Technical University of Liberec (TUL), Liberec campus, Czech Republic and signed a MOU in the field of Research & Development Activities with Faculty of Textile Engineering, Technical University of Liberec, Czech Republic on 13th Jan 2023.

15.0 WORK DONE BY THE PROJECT TEAM

▪ Sportech Cluster survey

Wool Research Association along with Archroma India has carried out Sportech Cluster Surveys in various zones as follows :

Touring Team

- Dr. Mrinal Choudhari, Joint Director, Wool Research Association (WRA),
- Mr. Alex Dhanadurai, Business Development Manager (Technical Textiles), Archroma
- Dr. Smita Bait, Deputy Director, Wool Research Association (WRA)

Purpose of survey: To understand, explore and evaluate Sportech Market

1. Region: Sportech Cluster in North India, (Delhi, Panipat, Meerut and Jalandhar)

Duration: 5 days (24th May 2022 to 29th May 2022)

Industry and Institutions Visited:

Panipat

- Mittal Industries and Carpet Washing (Digital Printing Industries)
- High Performance Textiles Pvt. Ltd. (High Performance fibre spinning Unit)

Meerut

- MSME-Technology Development Centre (PPDC)
- Peps Industries
- GISCO Industries
- M/S Mittal Rubber Pvt. Ltd

Jalandhar

- BKM, Football Chowk, Jalandhar
- Nivia, Jalandhar
- Universal Sports Industries
- Dr. B.R. Ambedkar, National Institute of Technology, (NIT) Jalandhar
- Extension center of PPDC, Jalandhar (MSME)
- Central Institute of Hand Tools
- T.K. Sports
- Leela Overseas

2. Region: Tirupur, Tamil Nadu

Duration: 5 days (2nd August 2022 to 6th August 2022)

Industry and Institutions Visited Tirupur:

- Page Industries (Jockey)
- Techno Sport Factory
- Jeyavishnu Dyeing Unit
- Techno Knitting Unit
- NIFT-TEA Knitwear Fashion Institute
- AIC-NIFT TEA Incubation Centre for Textile and Apparels
- PSG TECH -COE Indutech
- Pranera Services & Solution Pvt Ltd.
- Shiva Texyarn Limited

Gap Analysis on Sportech Industry**1. Requirement:** Wool/nylon blended fabric for lawn tennis ball

Expertise for Rubber ball- Already Available with Industry

Felt- 65%wool + 35% Nylon

Currently imported from Taiwan/ Indonesia

Gap: No Indian manufacturer

Requirement of Technical intervention:

Manufacturing of Wool nylon blended fabric

Dyeing wool and Nylon with fluorescent yellow colour

2. Requirement: Low cost 4 way stretch fabric for Sportswear

Gap: Imported from China, Taiwan, Indonesia etc.

Requirement of Technical intervention:

Availability from the Indian manufactures at the competitive prices

Technical knowhow of manufacturing techniques

3. Requirement: Dyed Nylon 66 knitted fabric with good fastness properties

Gap: Limited supplier and cost intensive

Requirement of Technical intervention:

Improvement in Nylon 66 Dyeing Technologies

4. Requirement: Manufacturing of Seamless garment and its technical knowhow Origin-Italy,

- Revolutionized the global production process
- Saves costs by 40% compared with usual knitting in manpower cost.
- Quality of yarn is the most critical factor that determines its quality.
- Initially used for inner ware

Gap: Limited availability of Machineries, Production Process and Techniques In India

Requirement of Technical intervention:

- Identification of Market potential and
- Investment requirement by Indian Apparel manufacture sector
- Santoni in Brescia is currently leading the market;
- Sangiacomo, Italy
- Merz, Germany

5. Requirement: Artificial turf manufacturing as per International Norms of FIFA, Hockey Federation etc.

Gap:

- Indian market is Import Oriented
- No Production and Certification facility in India

Requirement of Technical intervention:

- The global market for artificial turf was US\$ 3,624 Million whereas the Indian market Consumption stood at Rs. 107 Crores in 2019-20.
- The global market is expected to grow at a CAGR of 8.44% whereas the Indian market is expected to grow at a CAGR of 17.32% (Government is focusing on promotion of Sports activity through Khelo India Programme).
- Scope for Indian manufacturer for Meeting the requirement of Domestic and International market with Standardized products.
- International Players: Sport Group, Tarkett Group, Tencate Grass and SIS Pitches.

6. Requirement: Development of knitting technology for fabric using yarn with higher Lycra percentage

- Current Knitting technology can utilize the yarn up to 15% of Elastomeric yarn content

Gap: Limited technical knowhow for Knitting of fabric with higher Lycra percentage yarn

Requirement of Technical intervention:

- Compression garment require higher Lycra percentage (10%)
- Manufacturing facility needs to be synchronized with domestic and export requirement



Dr. Mrinal Choudhari, Dr. Smita Bait, WRA with Dr. Prakash Vasudevan Director, SITRA & Mr. S. Sivakumar, Head



Student and Industrial attending the Guest Lecture arranged by NIFT-TEA



Dr. Mrinal Choudhari, Dr. Smita Bait, WRA and Mr. Ashok, Archroma with Shri. SIVABALAN T, Managing Director, Pranera, Tirupur



Dr. Smita Bait in discussion with Mr. Amardeep Singh, Director, Animugh Sports



AIC-NIFT TEA

Incubation Centre for Textiles & Apparels

Supported by
Atal Innovation Mission, NITI Aayog, Govt. of India



Innovative Product Development in Apparel Production

Speaker

Dr. Mrunal Chowdry, JD & Dr. Smita Honde Bait Dep. JD

Wool Research Association

R. Anandharaman

Head sale south ARCHROMA

Date - 7 Aug 2022 Venue - Atal Incubation Centre, Tirupur, TN, IND




NIFT-TEA

AIC-NIFT-TEA

INNOVATIVE PRODUCT DEVELOPMENT
IN APPAREL INDUSTRY

AN INTRODUCTION & PRODUCT DISCUSSION

DATE : 04.08.22 - TIME : 11.00 AM TO 12.05 PM

VENUE : AIC - NIFT TEA TRAINING HALL

Moderator: Professor
Dr. K. P. Balakrishnan
Principal, NIFT-TEA College of Kottarakkottam

Resource Address
Mr. S. Periasamy
CEO, AIG - NIFT TEA

Chief Guest
Dr. Mrinal Choudhary
Joint Director of Wool Research Association

In-charge of Events
Gowri Shankar TR
Programme Lead, AIC - NIFT TEA

www.nifttea.ac.in www.aicnifttea.org




16.0 WEBINAR/ SEMINAR/ CONFERENCES /EXHIBITIONS ATTENDED:

- Mr. Shishir Tyagi, Attended SDC seminar as a speaker on versatility textile & Fashion in Sportech - Get into the smart & direct mode - at SGTPA, Surat on 28th May 2022.
- Mr. Shishir Tyagi Participated in 10th India International Sporting Goods Show Sport India-2022 on 5th August 2022 Organized by Ministry of Sports & Youth Affairs, Government of Uttar Pradesh .
- Mr. Shishir Tyagi Participated in two days Wool Stakeholders Meeting/Conference on Challenges and development through augmentation of different segments and use of technology held on 23rd & 24th Sept., 2022 at Clarion Bella Casa Hotel, Jaipur.
- Dr. Smita Bait attended a conference on “Digitalization – A Step Towards Textile 4.0” organised by TAI – Mumbai Unit on 14th October 2022 at Hotel The Lalit Mumbai, Mumbai
- Dr. Smita Bait attended Inauguration of BTRAs New Chemical Laboratory at BTRA on 10th October 2022
- Dr. Smita Bait attended ChromaTex Chem Exhibition on 14th October 2022 at Bombay Exhibition Center, WEH, Goregaon (E), Mumbai.
- Dr. Smita Bait attended National Conclave on Technical Textiles “Protech” on Wednesday, November 16, 2022 at Stein Auditorium, India Habitat Centre, New Delhi
- Mr. Shishir Tyagi Participated as a Speaker in “International Conference on Technical Textiles” organised by Ministry of Textiles, Government of India under its flagship scheme - National Technical Textiles Mission (NTTM) in partnership with Department of Textiles, Government of Tamil Nadu and Confederation of Indian Industry (CII) on 25th & 26th November 2022 at Hotel Feathers, Chennai.
- Mr. Shishir Tyagi Participated in DOMOTEX exhibition on 14 & 15 January 2023 held at Hannover, Germany.
- Mr. Shishir Tyagi, Mayur Basuk attended Technotex 2023 held at Bombay Exhibition Centre from 22.02.23 to 24.02.23, where WRA had the stall for COE-SPORTECH.
- Mayur Basuk attended Webinar on Sportswear and Knitting Technology on 21st June, 2022 organised by Maharashtra Centre for Entrepreneurship Development (MCED).

17.0 TRAINING PROGRAMME CONDUCTED /ATTENDED :**Training Programme Conducted**

- In plant training to two students of ICT Matunga - Mr. Sahil Jadhav and Mr Vedant Patil Third Year B Tech students for 12 week's internship from 20th May 2022.
- In plant training to one students of ICT Bhuvaneshwar, Mr Prathamesh Ambekar from 1st September 2022 to 31st October 2022.

Students Visits

Students from SVT College of Home Science, SNDT Women's University, Juhu Mumbai visited Wool Research Association on Saturday 17th September, 2022

Ms. Savita Lopez, Assistant Professor of SVT College of Home Science, SNDT Women's University, Juhu Mumbai visited Wool Research Association along with students.

The Purpose of the visit was to get professional knowledge and understanding of quality testing of textile and apparels and also enhance the knowledge of students in terms of different types and methods used for testing specific material.

During this visit 6 M. Design (Fashion Design) Second year students and 6 M. Design (Fashion Design) First year students with one faculty members were present.

During this visit Students visited Physical testing Laboratory, Eco laboratory, Chemical Laboratory they were explained and briefed various testing equipment's and standard methods used for textile material testing.

During pilot plant visit Knitting on Tricot and Raschel type machine was showed and various samples developed on these machines were explained in detail. In Sportech segment students were shown Sweating Thermal Mannequin and testing carried out on the same.



Conducted Webinar on “Sportech- The future of Sports Textiles and Accessories Industry in India”

Wool Research Association (WRA) and Indian Technical Textile Association (ITTA) along with Archroma India Pvt Ltd organised the Webinar on “Sportech- The future of Sports Textiles and Accessories Industry in India”. The webinar was held on 13th July 2022 from 2:30 pm to 6:30 pm via zoom platform. More than 190 participants from Textile and Technical Textile Industries, Institutions, Faculties, Research Scholars and students, were benefited out of the event.

Shri. Upendra Prasad Singh, IAS, Secretary Textiles, Ministry of Textile, GOI, Guest of honour of the Webinar in his inaugural address spoke about the Technical Textile Industry and its Growth and Challenges. He emphasized the penetration of Technical Textiles in India which is very less compared to First-World Countries. He stressed the importance of becoming net Exporters of Technical Textiles in the world and guided the attendees on the same.

Ms. Roop Rashi IA&AS Textile Commissioner, Ministry of Textiles, Government of India, Chief Guest of the webinar in her special address stressed the importance of Technical Textiles in the future of India. She motivated Industries to become self-reliant, especially in the Sportech segment as we do a lot of import for this sector. She suggested that industries and various sports boards should come together and discuss product development, and the needs of the consumer.

Shri. Amit Agarwal Chairman-ITTA in his welcome address discussed ITTA's vision for the Technical Textile business in India. He also mentioned the Policy Initiatives on Technical Textiles introduced by the Ministry of Textiles, Government of India.

Shri. K. K. Misra, Director (O) and COO of the WRA welcomed all the attendees and panel lists on the behalf of Organizing team. He briefed audience about work done at WRA and elaborated on the collaboration with ITTA and Archroma India Pvt Ltd for Sportech Sector.

Sportech Webinar covered introduction to this sector through two presentations, Products, Market, Growth & Export-Import by Dr. Anup Rakshit, ED, ITTA) in his introductory speech briefed about the Technical Textile Industry, its growth. He also added further role of Government of India in developing Technical Textile activity across the Nation and initiatives toward establishing a Technical Textile business in the Country.

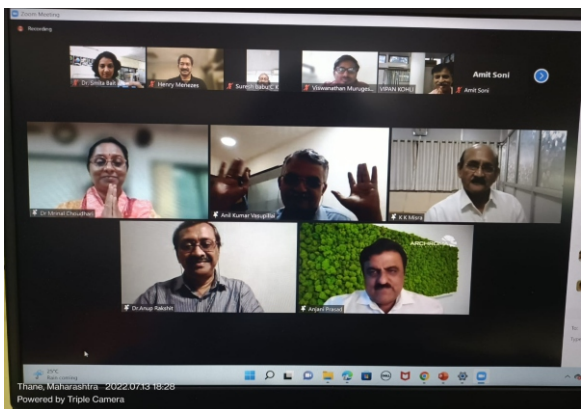
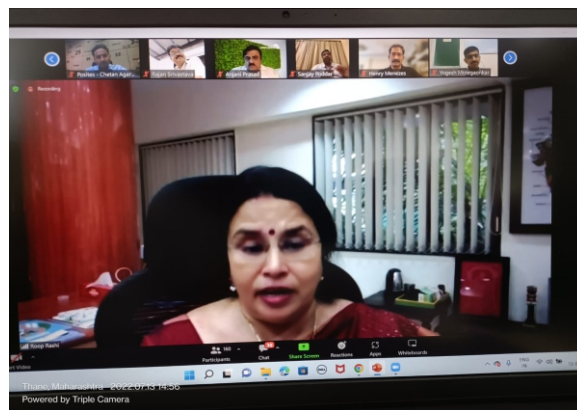
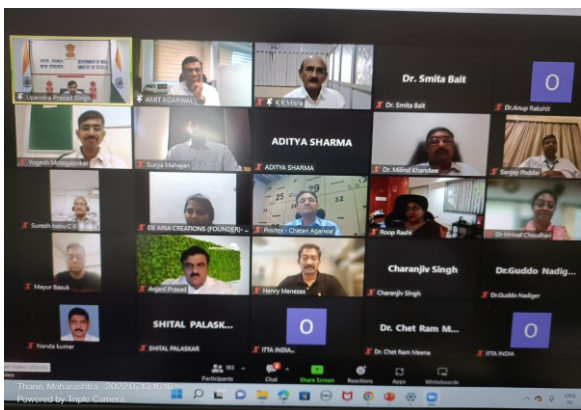
Second presentation on Gap analysis & Requirements by Dr. Smita Bait, Dy. Director, WRA briefed about Market Survey done in North India Panipat, Meerut and Jalandhar area. She highlighted gaps in the sportech segments and infrastructure available with WRA for strengthening this sector.

Two Panel discussions were conducted during this webinar. Panel Discussion 1 on Sports Goods and Accessories: Coated fabrics, Nets, Composites and Rubber Products moderated by Dr. Anup Rakshit, ED, ITTA. Six Panel members from Industry expressed their views on manufacturing facilities, market availability and requirements for Coated Fabric, Nets, Composites and rubber products.

Second Panel Discussion on Sports Apparel and Supply Chain Management moderated by Shri. A. K. Prasad, M.D & Head Business, Archroma. Six Panel members from Industry expressed their views on availability of Sportswear and cost factor pertaining to Indian market. Sustainability was the key factor stressed by all Panel members for future growth.

Summing up of the Webinar was done by Shri. Anil Kumar Vasupillai, Additional ED, ITTA.

Dr. Mrinal Choudhari, Joint Director, WRA Convener of the webinar announced future Conference on Sportech scheduled in the Month of September 2022 at Ludhiana region. Webinar was concluded by vote of thanks by Dr.Choudhari.



Training Programme attended

- Dr. Smita Bait attended Training Program On - Medical Textiles with The Theme: "Feasibility of Manufacturing Reusable PPE and Sustainable Solutions for Recycling of Disposable PPE Products", organised by Indian Technical Textile Association held on Tue, 24th - Wed, 25th May 2022 on the Digital Platform.

18.0 COUNCIL MEETINGS

Three Governing Council Meetings and One Annual General Meeting were held during the year 2022-2023.

156th Governing Council Meeting

Wool Research Association's 156th Governing Council Meeting was held on Wednesday, 29th June, 2022 at 12.30 p.m. in the Conference Room, Wool Research Association, P.O. Sandoz Baug, Kolshet Road, Thane – 400607

157th Governing Council Meeting

Wool Research Association's 157th Governing Council Meeting of Wool Research Association was held on **Tuesday, 30th August, 2022 at 12.30 p.m.** in the Conference Room, Wool Research Association, P.O. Sandoz Baug, Kolshet Road, Thane – 400 607

158th Governing Council Meeting

Wool Research Association's 158th Governing Council Meeting of Wool Research Association was held on Wednesday, 18th January, 2023 at 12.30 p.m. in the Conference Room, Wool Research Association, P.O. Sandoz Baug, Kolshet Road, Thane – 400 607

57th Annual General Meeting

57th Annual General Meeting of the Members of the Wool Research Association was held on Wednesday, 28th September, 2022 at 12 o'clock in the Conference Room, Wool Research Association, P.O. Sandoz Baug, Kolshet Road, Thane – 400 607

19.0 MEMBERS OF WRA**ORDINARY MEMBERS :**

01. M/s. Bhilwara Synthetics Ltd, Bhilwara
02. M/s. Banswara Syntex Limited, Banswara
03. M/s. Cashmere Marketing Agencies, Srinagar
04. M/s. Centex International Pvt. Ltd., Ludhiana
05. M/s. G. R. Woollen Mills Pvt. Ltd., Mumbai
06. M/s. Grentex & Co. Pvt. Ltd. Mumbai
07. M/s. Gujarat Sheep & Wool Development Corporation, Gandhinagar
08. M/s. Geetanjali Woollens Pvt. Ltd., Panchmahal
09. M/s. Grasim Industries (Jaya Shree Textiles), Hooghly
10. M/s. Kusumgar Corporates Pvt. Ltd., Mumbai
11. M/s. Kapotex Industries Pvt. Ltd., Gujarat
12. M/s. Modern Woollens , Mumbai
13. M/s. Raymond Limited., Thane
14. M/s. Saravanabava Mills, Mumbai
15. M/s. Shree Ram Textile Mills Ltd., Silvasa
16. M/s. Thaker Felts Pvt. Ltd., Vadodara
17. M/s. Wooltex Associates, Mumbai

ASSOCIATE MEMBERS :

18. M/s. Indian Woollen Mills Federation, Mumbai
19. M/s. Woolmark Services India Pvt. Ltd, Thane

SPECIAL ASSOCIATE MEMBERS :

20. M/s. The Synthetic & Art Silk Mills Research Association, Mumbai
21. M/s. OCM India Ltd, Amritsar

20.0 FOUNDER MEMBERS OF WOOL RESEARCH ASSOCIATION IN 1963

1. Mr. T.N. Khaitan.
Dhruva Woollen Mills Pvt. Ltd.,
Sun Mill Compound, Lower Parel, Bombay
2. Mr. G.K. Singhanian
Raymond Woollen Mills Ltd., J.K. Building,
Ballard Estate, Bombay
3. Mr. B.M. Grover
Modella Woollen Mills,
50, Vulcan Insurance Bldg.,
Veer Nariman Road, Bombay
4. Mr. L.P. Pittie
Bombay Woollen Mills P. Ltd.
20, Hamam Street, Bombay
5. Mr. R.K. Seth
Simplex Woollen Mills
Sadhana Raymond House,
D.N. Road, Bombay
6. Mr. R.B. Kanwar Rajnath
Ahmed Woollen Mills
Amernath C. Rly.
Office : 87, Tamba Kanta
Nakhoda Street, Bombay
7. Mr. T.K. Nagpal
Nagpal Woollen Mills
Old Atlas Mills Compound,
Reay Road, Bombay
8. Mr. R.K. Birla
Shree Digjam Woollen Mills
Aerodrome Road, Jamnagar

21.0 LIST OF CHAIRMAN EMERITUS / PRESIDENTS / SR.VICE PRESIDENTS & VICE PRESIDENTS SINCE INCEPTION

PERIOD/ YEAR	CHAIRMAN EMERITUS	PRESIDENT	SR. VICE PRESIDENT	VICE PRESIDENT
1964/65 to 1968/69	—	Mr.G..K. Singhania Raymond Woollen Mills	Mr. T.N. Khaitan Dhruva Woollen Mills	Mr. L.P. Pittle Bombay Woollen Mills
1969/70	—	Mr. U.M. Patel Dinesh Woollen Mills	Mr. B.M. Grover Modella Woollen Mills	Mr. B.B. Nagpal Nagpal Woollen Mills
1970/71 to 1975/76	—	Mr. B.M. Grover Modella Woollen Mills	Mr. L.P. Pittle Bombay Woollen Mills	Mr. R.K. Seth Simplex Woollen Mills
1976/77 to 1977/78	—	Mr. B.M. Grover Modella Woollen Mills	Mr. L.P. Pittle Bombay Woollen Mills	Mr. T.N. Khaitan Dhruva Woollen Mills
1978/79 to 1981/82	—	Mr. B.M. Grover Modella Woollen Mills	Mr. T.N. Khaitan Dhruva Woollen Mills	Mr. B.K. Kedia Raymond Woollen Mills
1982/83	—	Mr. T.N. Khaitan Dhruva Woollen Mills	Mr. B.K. Kedia Raymond Woollen Mills	Mr. U.M. Patel Dinesh Woollen Mills
1983/84	—	Mr. Ravikant Kapur G.R. Woollen Mills Ltd	Mr. U.M. Patel Dinesh Woollen Mills	Mr. K.V. Iyer Raymond Woollen Mills
1984/85 to 1993/94	—	Mr. B.K. Kedia Raymond Woollen Mills	Mr. U.M. Patel Dinesh Woollen Mills	Mr. Ravikant Kapur Grentex & Co.
1994/95 to 1997/98	Mr. B.K. Kedia Raymond Woollen Mills	Mr. Ravikant Kapur G.R. Woollen Mills Ltd	Mr. U.M. Patel Dinesh Woollen Mills	Mr. K.V. Iyer Raymond Woollen Mills
1998/99 to 1999-2000	Mr. B.K. Kedia Raymond Woollen Mills	Mr. Ravikant Kapur G.R. Woollen Mills Ltd	Shri. Hari Prasad Kedia Raymond Limited	Shri.A.N. Choudhary Jayashree Textiles
2000-2002	Mr. B.K. Kedia Raymond Woollen Mills	Mr. Ravikant Kapur G.R. Woollen Mills Ltd	Shri. V.K. Bhartia Raymond Limited	Shri.A.N. Choudhary Jayashree Textiles
2002-2004	Mr. B.K. Kedia Raymond Woollen Mills	Mr. Ravikant Kapur G.R. Woollen Mills Ltd	Shri. V.K. Bhartia Raymond Limited	Shri.A.N. Choudhary Jayashree Textiles
2004-2006	Mr. B.K. Kedia Raymond Woollen Mills	Mr. Ravikant Kapur G.R. Woollen Mills Ltd	Shri. V.K. Bhartia Raymond Limited	Shri.A.N. Choudhary Jayashree Textiles
2006-2008	Mr. B.K. Kedia Raymond Woollen Mills	Mr. Ravikant Kapur G.R. Woollen Mills Ltd	Shri.S.K. Singhal Raymond Limited	Shri.R.K.Khanna Amritsar Swadeshi
2008-2010	Mr. B.K. Kedia Raymond Woollen Mills	Mr. Ravikant Kapur G.R. Woollen Mills Ltd	Shri.S.K. Singhal Raymond Limited	Shri.R.K.Khanna Amritsar Swadeshi
2010-2012	—	Mr. Ravikant Kapur G.R. Woollen Mills Ltd	Shri.S.K. Singhal Raymond Limited	Shri.R.K.Khanna Amritsar Swadeshi
2012-2014	—	Mr. Ravikant Kapur G.R. Woollen Mills Ltd	Shri. S.L. Pokharna Raymond Ltd	Shri.R.K.Khanna Amritsar Swadeshi Shri. R.K. Khandelwal Raymond Ltd
2014-2016	—	Mr. Ravikant Kapur G.R. Woollen Mills Ltd	Shri. H.K. Chatterjee Raymond Ltd	Shri. Deepak Goel Geetanjali Woollens P. L. Shri. R.K. Khandelwal Raymond Ltd
2016-2018	Mr. Ravikant Kapur Grentex & Co. Pvt. Ltd.	Shri. H.K. Chatterjee Raymond Ltd	Shri. Deepak Goel Geetanjali Woollens P. Ltd.	Shri. R.K. Khandelwal Raymond Ltd
2018-2020	Mr. Ravikant Kapur Grentex & Co. Pvt. Ltd.	Shri. H.K. Chatterjee Raymond Ltd	Shri. Deepak Goel Geetanjali Woollens P. Ltd.	-----
2020-2022	Mr. Ravikant Kapur Grentex & Co. Pvt. Ltd.	Shri. H.K. Chatterjee Raymond Ltd	Shri. Deepak Goel Geetanjali Woollens P. Ltd.	-----
2022-2024	Mr. Ravikant Kapur Grentex & Co. Pvt. Ltd.	Shri. H.K. Chatterjee Raymond Ltd	Shri. Deepak Goel Geetanjali Woollens P. Ltd.	-----

22.0 LIST OF DIRECTOR GENERAL /DIRECTORS/ JOINT DIRECTOR /DY.DIRECTORS SINCE INCEPTION

PERIOD (YEAR)	SECRETARY	DIRECTOR GENERAL	DIRECTOR	JOINT DIRECTOR	DEPUTY DIRECTOR
1964/65	Mr. J.N. Chaudhuri	-	-	-	-
1965/66	Mr. A.C. Chaudhuri	-	-	-	Dr.M.G. Kulkarni
1966/67 & 1967/68	Mr. A.C. Chaudhuri	-	-	-	Dr. N.P. Badve
1968/69 & 1969/70	Mr. A.C. Chaudhuri	-	-	-	Dr. N.P. Badve
1970/71 to 1977/78	Mr. A.C. Chaudhuri	-	Mr. Sule Assistant Director (from 1971 to 1975)	-	-
1978/79	Mr. A.C. Chaudhuri	-	Dr.V.G. Kulkarni	-	-
1979/80	Mr. A.C. Chaudhuri	-	-	-	Dr. (Mrs) Usha Nandurkar
1980/81 & 1981/82	-	-	Dr. A.D.M. Nath	-	Dr. (Mrs) Usha Nandurkar
1983/84 to 1985/86	-	-	Dr. (Mrs) Usha Nandurkar	-	-
1986/87 to 1987/88	-	-	Dr.(Mrs) S. Patwardhan (Offg)	-	-
1988/89 to 1998/99	-	-	Dr.(Mrs) S. Patwardhan	-	-
Jan' 2000 - 7 th Sept.2003	-	-	Mrs. G.P. Rane Acting Director (Offg)	-	-
8 th Sept.2003 - 7 th Sept.2006	-	-	Mr. S.C. Agarwal	-	Mrs. G.P. Rane
8 th Sept.2006	-	-	-	-	Mrs. G.P. Rane
2 nd July, 2007 to 2015	-	-	Mr. M.K. Bardhan	-	-
1 st March 2012-15	-	-	-	-	Dr. (Mrs) Mrinal Choudhari
January,2016 onwards	-	Mr. M. K. Bardhan	-	Dr. (Mrs.) Mrinal Choudhari	Mr. P.R.Kulkarni
May- Dec,' 2016	-	-	Dr. Suman Bhattacharyya	-	-
June, 2016 onwards	-	-	-	-	Mr. Shivendra Parmar
Feb.'2017 till Sep., 2019 June,2017 onwards August,2017 onwards	-	-	Dr. A.K. Sharma	Dr. (Mrs.) Mrinal Choudhari Ms. Seema Patel Mr. Pawan Sharma	-
July, 2019	-	-	Dr. Md. S. Rahman	Dr. (Mrs.) Mrinal Choudhari Ms. Seema Patel Mr. Pawan Sharma	-
Dec., 2020 onwards	-	-	Mr. K. K. Misra Director (Officiating) C.O.O.	Dr. (Mrs.) Mrinal Choudhari Ms. Seema Patel	-
April, 2021 onwards	-	-	Mr. K. K. Misra Director (Officiating) C.O.O.	Dr. (Mrs.) Mrinal Choudhari Ms. Seema Patel	Dr. Smita Bait Mr. Shishir Tyagi Mr. Mayur Basuk
Jan, 2023	-	Mr. M.K. Bardhan Director General Emeritus	Mr. K. K. Misra Director (Officiating) C.O.O.	Dr. (Mrs.) Mrinal Choudhari Ms. Seema Patel	Mr. Shishir Tyagi Mr. Mayur Basuk

23.0 LIST OF DONOR MEMBERS

SR. NO.	NAME OF THE ORGANISATION	YEAR OF DONATION
1	M/s Raymond Woollen Mills	1971-72
2	M/s Modella Woollens Ltd	1971-72
3	M/s Shree Dinesh Mills	1971-72
4	M/s G.K. Nagpal Sons	1971-72
5	M/s Beekay & Sons	1971-72
6	M/s Shree Digvijay Woollen Mills Ltd.	1971-72
7	M/s Dhruva Woollen Mills	1971-72
8	M/s Wool Combers of India	1971-72
9	M/s Bombay Woollen Mills	1971-72
10	M/s Karamchand Tulsidas	1971-72
11	Shri. B.M. Grover - Chairman - Modella (For Physical & Colour Research Laboratory)	1976-77
12	Shri Gopal Krishna Singhania - Raymond (For Chemical Research Laboratory)	1980-81
13	Shri. Upendrabhai M. Patel - Chairman Shri Dinesh Mills Ltd (For Textile Research Department)	1992-93
14	M/s. R. G. Deshpande and Bros.	1999-2000
15	Shri. M. K. Bardhan, Ex-Director, W.R.A.	2019-2020

24.0 EDUCATIONAL ACTIVITIES

- Shri. Mayur Basuk is pursuing Ph.D.

25.0 ACKNOWLEDGEMENT

We are thankful to Ministry of Textiles, Ministry of Finance, Central Wool Development Board, Office of the Textile Commissioner, Department of Science & Technology, Indian Woollen Mills Federation for the help extended to Wool Research Association from time to time.

**J.P.J. ASSOCIATES LLP
CHARTERED ACCOUNTANTS**

Registered Office :
D/401, Shantidwar C & D Wing CHS
Shantivan, Borivali (East)
Mumbai - 400066

Tel : 022 – 6883 1279
Email : jpj@jpjassociates.com

AUDITOR'S REPORT

**To The Members
Wool Research Association
Thane**

Report on the Financial Statements

We have audited the accompanying financial statements of Wool Research Association (“the Society”), which comprise the Balance Sheet as at March 31, 2023, and the Income and Expenditure Account for the year then ended, and a summary of significant accounting policies and other explanatory information.

Management's Responsibility for the Financial Statements

Management is responsible for the preparation of these financial statements that give a true and fair view of the financial position, financial performance in accordance with the Accounting Standards and Generally accepted accounting principles. This responsibility includes the design, implementation and maintenance Forming an Opinion and Reporting on Financial Statements of internal control relevant to the preparation and presentation of the financial statements that give a true and fair view and are free from material misstatement, whether due to fraud or error.

Auditor's Responsibility

Our responsibility is to express an opinion on these financial statements based on our audit. We conducted our audit in accordance with the Standards on Auditing issued by the Institute of Chartered Accountants of India. Those Standards require that we comply with ethical requirements and plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement. An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the Society's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of the accounting estimates made by management, as well as evaluating the overall presentation of the financial statements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Opinion

In our opinion and to the best of our information and according to the explanations given to us, the financial statements give the information required by the Act in the manner so required and give a true and fair view subject to

- a) Note No.3 regarding Balance Confirmations and GST reconciliation,
- b) Note No. 4 regarding Subscription
- c) Note No. 6 Non provision of diminution of Value of investment.
- d) Note No. 10 Non Provision of Depreciation.

in conformity with the accounting principles generally accepted in India:

(a) in the case of the Balance Sheet, of the state of affairs of the Society as at March 31, 2023;

(b) in the case of the Income and Expenditure Account, the Excess of Expenditure over Income for the year ended on that date; and

Report on Other Legal and Regulatory Requirements

a. we have obtained all the information and explanations which to the best of our knowledge and belief were necessary for the purpose of our audit;

b. in our opinion proper books of account as required by law have been kept by the Society so far as appears from our examination of those books;

c. the Balance Sheet, Income and Expenditure Account dealt with by this Report are in agreement with the books of account;

For J.P.J. ASSOCIATES LLP
 CHARTERED ACCOUNTANTS
 FIRM REG.NO. 113012 W/W100296

Sd/-

VAIBHAV VAIDYA
 PARTNER
 MEM. NO. 157754

Date: 24/08/2023
 UDIN: 23157754BGUAHZ7662

WOOL RESEARCH ASSOCIATION, THANE.
BALANCE SHEET AS ON 31st MARCH 2023

AS ON 31/03/2022 Rs.	LIABILITIES	SCHE- DULE	AS ON 31/03/2023 Rs.	AS ON 31/03/2022 Rs.	ASSETS	SCHE- DULE	AS ON 31/03/2023 Rs.
11,33,04,083	CAPITAL FUND	A	11,53,50,036	37,17,69,975	FIXED ASSETS	E	37,94,94,772
12,65,73,234	RESERVES	B	16,27,01,598	11,56,400	<u>INVESTMENT AT COST</u>		11,56,400
3,59,74,637	SUNDRY LIABILITIES	C	3,50,26,013		11564/- Equity shares of Rs.100/- each fully paid up of M/s.Gujarat Sheep & Wool Development Corpn. Ltd., (for break-up value of the shares, please refer to Note 6 the notes on Account schedule "L")		
24,46,34,320	GRANT-IN-AID FROM MOT, KVIC, AIHB, & UNDP TOWARDS CAPITAL EXPS. FOR SPECIAL PROJECTS	D	24,79,85,674				
	<u>COE - SPORTECH</u>						
	OP.Balance 25,010						
	Grant recd. —						
	Add: Int.recd. on F.D. 8,82,960						
	Add: EMD & Other receipts 1,53,579						
	10,61,549			12,76,88,271	CURRENT ASSETS	F	16,47,07,506
25,010	Less : Funds applied/utilised 10,37,188		24,361	1,03,64,886	LOANS & ADVANCES	G	92,78,593
	<u>Design & Dev.of Light weight..</u>						
	OP.Balance 25,826						
	Grant recd. 5,82,546						
	Industry's/Institutes Share —						
	Add: Other receipts —			2,63,22,665	PROJECTS	H	1,49,33,001
	6,08,372						
25,826	Less : Funds applied/utilised 5,82,738		25,634				
	<u>MAVIM</u>						
	Op. Balance 1,67,65,087						
	Grant recd. 1,16,00,000						
	Add: Int.recd. on F.D. 20,38,119						
	Add: Other receipts. 58,55,767						
	3,62,58,973						
1,67,65,087	Less : Funds applied/utilised 2,78,02,017		84,56,956				
53,73,02,197	TOTAL		56,95,70,272	53,73,02,197	TOTAL		56,95,70,272

for J.P.J. ASSOCIATES LLP
CHARTERED ACCOUNTANTS
FIRM REG.NO. 113012 W/W100296

NOTE : SEE SCHEDULE 'L' OF NOTES ON ACCOUNTS AS PER OUR REPORT OF EVEN DATE ATTACHED.

Sd/-
VAIBHAV VAIDYA
PARTNER
MEM. NO. 157754

Sd/-
R.V. BHANDARKAR
SR. ACCTS. OFFICER

Sd/-
K. K. MISRA
DIRECTOR (OFFICIATING) & COO

Sd/-
H. K. CHATTERJEE
PRESIDENT

PLACE : MUMBAI
DATE : 24/08/2023

WOOL RESEARCH ASSOCIATION, THANE.
INCOME AND EXPENDITURE ACCOUNT FOR NON-PLAN A/C FOR THE YEAR ENDED 31st MARCH 2023

AS ON 31/03/2022 Rs.	EXPENDITURE	SCHE- DULE	AS ON 31/03/2023 Rs.	AS ON 31/03/2022 Rs.	INCOME	SCHE- DULE	AS ON 31/03/2023 Rs.
2,47,32,668	STAFF SALARY	I	2,55,41,363	2,10,00,000	GRANT-IN-AID FROM MINISTRY OF TEXTILES, GOVT.,OF INDIA TOWARDS RECURRING EXPENDITURE		2,10,00,000
1,32,71,197	ESTABLISHMENT CHARGES	J	1,63,79,819				
60,000	AUDIT FEES		60,000				
48,850	AGM ,SEMINAR & MEETING AND CONFERENCE EXPS.		48,509	1,78,26,586	SCHEDULE - (INCOME) INDUSTRY'S CONTRIBUTION TOWARDS RECURRING EXPS.	K	2,27,72,649
6,19,277	CHEMICALS AND RAW MATERIAL		8,77,114				
	BAD DEBTS WRITTEN OFF		7,75,937	7,33,348	EXCESS OF EXPENDITURE OVER INCOME CARRIED TO BALANCE SHEET		8,87,333
94,593	PROJECT COST INCURRED BY WRA		89,908				
7,33,348	DEPRECIATION		8,87,333				
3,95,59,934	TOTAL		4,46,59,983	3,95,59,934	TOTAL		4,46,59,983

NOTE : SEE SCHEDULE 'L' OF NOTES ON ACCOUNTS AS PER OUR REPORT OF EVEN DATE ATTACHED.

for J.P.J. ASSOCIATES LLP
 CHARTERED ACCOUNTANTS
 FIRM REG.NO. 113012 W/W100296

Sd/-
 VAIBHAV VAIDYA
 PARTNER
 MEM. NO. 157754

Sd/-
 R.V. BHANDARKAR
 SR. ACCTS. OFFICER

Sd/-
 K. K. MISRA
 DIRECTOR (OFFICIATING) & COO

Sd/-
 H. K. CHATTERJEE
 PRESIDENT

PLACE : MUMBAI
 DATE : 24/08/2023

WOOL RESEARCH ASSOCIATION
(R & D PROJECT)
INCOME & EXPENDITURE ACCOUNT FOR THE YEAR ENDED 31ST MARCH, 2023

PROJECT : Development of Novel Detergent Formulation for wool with immobilized enzymes for enhancing machine wash ability of wool fabric.

(SCHEDULE - 1)

PREVIOUS YEAR (Rs.)	EXPENDITURE	CURRENT YR. (Rs.)	PREVIOUS YEAR (Rs.)	INCOME (Rs.)	CURRENT YR. (Rs.)
–	Raw material/consumables	–	27,580 (Due)	Grant-in-Aid from Ministry of Textiles, New Delhi	46,060
--	Consultancy	--			
39,400	Promotion/Proof of Concept	65,800	11,820	Industry's/WRA's contribution	19,740
39,400	TOTAL	65,800	39,400	TOTAL	65,800

Note : See schedule 'L' of Notes on Accounts as per our report of even date attached.

for J.P.J. ASSOCIATES LLP
 CHARTERED ACCOUNTANTS
 FIRM REG.NO. 113012 W/W100296

Sd/-
 VAIBHAV VAIDYA
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 MEM. NO. 157754

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 K. K. MISRA
 DIRECTOR (OFFICIATING) & COO

Sd/-
 H. K. CHATTERJEE
 PRESIDENT

PLACE : MUMBAI
 DATE : 24/08/2023

WOOL RESEARCH ASSOCIATION
(R & D PROJECT)
INCOME & EXPENDITURE ACCOUNT FOR THE YEAR ENDED 31ST MARCH, 2023

PROJECT : Design and Development of sportswear and sports accessories having Thermo Physiological comfort properties in order to enhance the performance assessed by using a Sweating Thermal Manikin system under different environmental conditions

(SCHEDULE - 2)

PREVIOUS YEAR (Rs.)	EXPENDITURE	CURRENT YR. (Rs.)	PREVIOUS YEAR (Rs.)	INCOME (Rs.)	CURRENT YR. (Rs.)
—	Salaries/Wages	1,50,000	0 (Due)	Grant-in-Aid from Ministry of Textiles, New Delhi	1,45,880
—	Promotion/Proof of Concept	-			
—	Raw material/consumables	20,400			
—	Consultancy	18,000	0	Industry's/WRA's contribution towards project expenses	62,520
—	Overhead/Contingencies	20,000			
—	TOTAL	2,08,400	0	TOTAL	2,08,400

Note : See schedule 'L' of Notes on Accounts as per our report of even date attached.

for J.P.J. ASSOCIATES LLP
 CHARTERED ACCOUNTANTS
 FIRM REG.NO. 113012 W/W100296

Sd/-
 VAIBHAV VAIDYA
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 MEM. NO. 157754

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Sd/-
 K. K. MISRA
 DIRECTOR (OFFICIATING) & COO

Sd/-
 H. K. CHATTERJEE
 PRESIDENT

PLACE : MUMBAI
 DATE : 24/08/2023

WOOL RESEARCH ASSOCIATION**(R & D PROJECT)****INCOME & EXPENDITURE ACCOUNT FOR THE YEAR ENDED 31ST MARCH, 2023**

PROJECT : Development of cost effective handmade carpets & Floor Coverings, Home Furnishings & Knitwears using Jute (Treated Woolenised or Unteated) & other natural fibres with value added eco-friendly finishes such as with Flame Retardancy, Mosquito Repellent, Anti-Bacterial/Antimicrobial Properties etc."

(SCHEDULE - 3)

PREVIOUS YEAR (Rs.)	EXPENDITURE	CURRENT YR. (Rs.)	PREVIOUS YEAR (Rs.)	INCOME (Rs.)	CURRENT YR. (Rs.)
—	Salaries/Wages	6,13,850	—	Grant-in-Aid from National Jute Board, Ministry of Textiles, Govt. of India Kolkatta	16,91,021
—	Consultancy	47,595			
—	Raw material/consumables	4,45,387			
—	Proof of Concept	2,26,202			
—	Trial & Testing	1,26,049			
—	Monitoring & Review	36,414			
—	Overhead/Contingencies	1,53,562			
--	Travelling	41,962			
0.00	TOTAL	16,91,021	0.00	TOTAL	16,91,021

Note : See schedule 'L' of Notes on Accounts as per our report of even date attached.

for J.P.J. ASSOCIATES LLP
CHARTERED ACCOUNTANTS
FIRM REG.NO. 113012 W/W100296

Sd/-
VAIBHAV VAIDYA
PARTNER
MEM. NO. 157754

Sd/-
R.V. BHANDARKAR
SR. ACCTS. OFFICER

Sd/-
K. K. MISRA
DIRECTOR (OFFICIATING) & COO

Sd/-
H. K. CHATTERJEE
PRESIDENT

PLACE : MUMBAI
DATE : 24/08/2023

WOOL RESEARCH ASSOCIATION
(R & D PROJECT)
INCOME & EXPENDITURE ACCOUNT FOR THE YEAR ENDED 31ST MARCH, 2023

PROJECT : Sustainable Enhancement of Aesthetic values of Woolens by Digital Printing

(SCHEDULE - 4)

PREVIOUS YEAR (Rs.)	EXPENDITURE	CURRENT YR. (Rs.)	PREVIOUS YEAR (Rs.)	INCOME (Rs.)	CURRENT YR. (Rs.)
—	Salaries/Wages	6,00,000	—	Grant-in-Aid from Central Wool Development Board Ministry of Textiles, Govt. of India, Jodhpur	6,15,613
—	Raw material/consumables	399	—		
—	Travelling	2,840	—		
—	Administrative expenses	12,374	—		
0.00	TOTAL	6,15,613	0.00	TOTAL	6,15,613

Note : See schedule 'L' of Notes on Accounts as per our report of even date attached.

for J.P.J. ASSOCIATES LLP
 CHARTERED ACCOUNTANTS
 FIRM REG.NO. 113012 W/W100296

Sd/-
 VAIBHAV VAIDYA
 PARTNER
 MEM. NO. 157754

Sd/-
 R.V. BHANDARKAR
 SR. ACCTS. OFFICER

Sd/-
 K. K. MISRA
 DIRECTOR (OFFICIATING) & COO

Sd/-
 H. K. CHATTERJEE
 PRESIDENT

PLACE : MUMBAI
 DATE : 24/08/2023

WOOL RESEARCH ASSOCIATION
PROJECT A/C - COE-SPORTECH

(SCHEDULE - 5)

PREVIOUS YEAR (2021-22) (Rs.)	RECEIPTS (Rs.)	CUREENT YEAR (2022-23) (Rs.)	PREVIOUS YEAR (2021-22) (Rs.)	PAYMENTS (Rs.)	CUREENT YEAR (2022-23) (Rs.)
25,659	Opening Balance	25,010	-	Sundry Debtors	1,45,083
8,15,556	Interest on FD	8,82,960	81,564	TDS receivable	88,308
10,341	Accrued Interest (Net)	8,496	3,36,000	EMD refunded	-
2,20,206	Sundry Debtors	-	7,44,333	Fixed Deposits	8,03,148
1,15,794	TDS refund (recd.)	1,45,083	649	Bank Charges	649
			25,010	Bank Balance	24,361
11,87,556	TOTAL	10,61,549	11,87,556	TOTAL	10,61,549

Note : See schedule 'L' of Notes on Accounts as per our report of even date attached.

for J.P.J. ASSOCIATES LLP
CHARTERED ACCOUNTANTS
FIRM REG.NO. 113012 W/W100296

Sd/-
VAIBHAV VAIDYA
PARTNER
MEM. NO. 157754

Sd/-
R.V. BHANDARKAR
SR. ACCTS. OFFICER

Sd/-
K. K. MISRA
DIRECTOR (OFFICIATING) & COO

Sd/-
H. K. CHATTERJEE
PRESIDENT

PLACE : MUMBAI
DATE : 24/08/2023

**WOOL RESEARCH ASSOCIATION
PROJECT A/C - LAB UPGRADATION**

(SCHEDULE - 6)

PREVIOUS YEAR (2021-22) (Rs.)	RECEIPTS (Rs.)	CUREENT YEAR (2022-23) (Rs.)	PREVIOUS YEAR (2021-22) (Rs.)	PAYMENTS (Rs.)	CUREENT YEAR (2022-23) (Rs.)
5,00,000	Sundry Debtors	8,70,696	5,00,000	Sundry Creditors	8,70,696
5,00,000	TOTAL	8,70,696	5,00,000	TOTAL	8,70,696

Note : See schedule 'L' of Notes on Accounts as per our report of even date attached.

for J.P.J. ASSOCIATES LLP
CHARTERED ACCOUNTANTS
FIRM REG.NO. 113012 W/W100296

Sd/-
VAIBHAV VAIDYA
PARTNER
MEM. NO. 157754

Sd/-
R.V. BHANDARKAR
SR. ACCTS. OFFICER

Sd/-
K. K. MISRA
DIRECTOR (OFFICIATING) & COO

Sd/-
H. K. CHATTERJEE
PRESIDENT

PLACE : MUMBAI
DATE : 24/08/2023

WOOL RESEARCH ASSOCIATION

PROJECT A/C. - Design and Development of Light Weight and high Impact resistance sports goods

(SCHEDULE - 7)

PREVIOUS YEAR (2021-22) (Rs.)	RECEIPTS (Rs.)	CUREENT YEAR (2022-23) (Rs.)	PREVIOUS YEAR (2021-22) (Rs.)	PAYMENTS (Rs.)	CUREENT YEAR (2022-23) (Rs.)
28,245	Opening Balance	25,826	—	Consultancy Charges	3,87,044
—	Grant received from MOT	5,82,546	—	Consumables	1,61,803
			—	Sundry Creditors	8,632
			2,419	Bank Charges	5,192
			—	Overhead exps.	20,067
			25,826	Bank Balance	25,634
28,245	TOTAL	6,08,372	28,245	TOTAL	6,08,372

Note : See schedule 'L' of Notes on Accounts as per our report of even date attached.

for J.P.J. ASSOCIATES LLP
CHARTERED ACCOUNTANTS
FIRM REG.NO. 113012 W/W100296

Sd/-
VAIBHAV VAIDYA
PARTNER
MEM. NO. 157754

Sd/-
R.V. BHANDARKAR
SR. ACCTS. OFFICER

Sd/-
K. K. MISRA
DIRECTOR (OFFICIATING) & COO

Sd/-
H. K. CHATTERJEE
PRESIDENT

PLACE : MUMBAI
DATE : 24/08/2023

WOOL RESEARCH ASSOCIATION

PROJECT A/C. - Mahila Arthik Vikas Mahamandal (MAVIM)

(SCHEDULE - 8)

PREVIOUS YEAR (2021-22) (Rs.)	RECEIPTS (Rs.)	CUREENT YEAR (2022-23) (Rs.)	PREVIOUS YEAR (2021-22) (Rs.)	PAYMENTS (Rs.)	CUREENT YEAR (2022-23) (Rs.)
13,99,522	Opening balance	1,67,65,087	2,79,39,056	Fixed Deposit	-
7,57,68,000	Grant from MAVIM (Govt.of Maharashtra)	1,16,00,000	-	Sundry Creditors	34,07,310
2,56,131	Sundry Creditors	-	1,20,17,240	Fixed assets	49,04,198
4,91,343	Interest earned	20,38,119	16,08,560	Sundry Debtors	-
-	Fixed Deposit	27,52,032	78,92,600	Mandays/Salary expenses/Consultancy	1,07,81,000
-	Sundry Debtors	30,21,003	5,59,657	Travelling expenses	6,43,839
70,000	Salary payable	-	51,58,956	Raw material	32,71,374
27,104	TDS receivable (recd.)	82,732	12,58,597	Testing and Inspetion charges	4,52,401
			-	Salary payable	69,450
			1,91,062	Interest accrued (Net)	66,059
			49,148	TDS receivable	2,03,717
			5,27,169	Misc. exps.	10,11,787
			4,590	Processing cost	1,95,300
			24,27,400	Carpet Designs	24,48,197
			2,173	Bank Charges	1,286
			14,11,360	Designing/hardware/software	2,96,100
			1,99,445	Web designing	50,000
			1,67,65,087	Bank Balance	84,56,956
7,80,12,100	TOTAL	3,62,58,974	7,80,12,100	TOTAL	3,62,58,974

Note : See schedule 'L' of Notes on Accounts as per our report of even date attached.

for J.P.J. ASSOCIATES LLP
CHARTERED ACCOUNTANTS
FIRM REG.NO. 113012 W/W100296

Sd/-
VAIBHAV VAIDYA
PARTNER
MEM. NO. 157754

Sd/-
R.V. BHANDARKAR
SR. ACCTS. OFFICER

Sd/-
K. K. MISRA
DIRECTOR (OFFICIATING) & COO

Sd/-
H. K. CHATTERJEE
PRESIDENT

PLACE : MUMBAI
DATE : 24/08/2023

WOOL RESEARCH ASSOCIATION

PROJECT A/C. - CENTRAL WOOL DEVELOPMENT BOARD (CWDB)

(SCHEDULE - 9)

PREVIOUS YEAR (2021-22) (Rs.)	RECEIPTS (Rs.)	CUREENT YEAR (2022-23) (Rs.)	PREVIOUS YEAR (2021-22) (Rs.)	PAYMENTS (Rs.)	CUREENT YEAR (2022-23) (Rs.)
—	Grant-in-Aid	22,98,207	—	Sundry Debtors	5,24,051
—	Sundry Creditors	99,000	—	Raw material	12,44,743
--	AXIS BANK	2,68,338	—	Salary exps.	6,55,000
			—	Lab equipment	2,27,349
			—	Travelling exps.	9,911
			--	Bank charges	4,490
0.00	TOTAL	26,65,545	0.00	TOTAL	26,65,545

Note : See schedule 'L' of Notes on Accounts as per our report of even date attached.

for J.P.J. ASSOCIATES LLP
CHARTERED ACCOUNTANTS
FIRM REG.NO. 113012 W/W100296

Sd/-
VAIBHAV VAIDYA
PARTNER
MEM. NO. 157754

Sd/-
R.V. BHANDARKAR
SR. ACCTS. OFFICER

Sd/-
K. K. MISRA
DIRECTOR (OFFICIATING) & COO

Sd/-
H. K. CHATTERJEE
PRESIDENT

PLACE : MUMBAI
DATE : 24/08/2023

WOOL RESEARCH ASSOCIATION, THANE.**SCHEDULE "A"**

AS ON 31/03/2022 Rs.	CAPITAL FUND	AS ON 31/03/2023 Rs.
7,62,10,825	Balance as per last Balance sheet.	11,21,47,683
7,62,10,825		11,21,47,683
3,59,36,858	Add : Project Assets taken over during the year	20,45,953
11,21,47,683		11,41,93,636
-		-
11,21,47,683		11,41,93,636
11,56,400	a) EARMARKED CAPITAL FUND : [Being donation received from members for investment in M/s. Gujarat Sheep & Wool Development Corporation Ltd., in terms of resolution passed in 23rd G.C. meeting held on 26th August, 1971.]	11,56,400
11,33,04,083	TOTAL	11,53,50,036

WOOL RESEARCH ASSOCIATION, THANE.**SCHEDULE "B"****RESERVES**

AS ON 31/03/2022 Rs.	PARTICULARS	AS ON 31/03/2023 Rs.
	<u>I. DEPRECIATION RESERVE A/C.</u>	
1,26,13,146	a] Depreciation upto last year	1,33,46,494
7,33,348	b] Depreciation for the year	8,87,333
1,33,46,494		1,42,33,827
	<u>II. RESEARCH AND DEVELOPMENT AND REPLACEMENT / UPGRADATION RESERVE</u>	
1,10,00,508	Balance as per last balance sheet.	1,10,00,508
—	Add : Addition during the year.	—
1,10,00,508		1,10,00,508
	<u>III. EDUCATION FUND.</u>	
3,66,620	Balance as per last balance sheet.	3,76,430
9,810	Add : Interest received during the year	10,018
3,76,430		3,86,448
	<u>IV. CORPUS FUND</u>	
7,50,48,841	Balance as per last balance sheet.	10,16,28,059
2,73,12,566	Add : Addition during the year.	3,63,40,089
10,23,61,407		13,79,68,148
7,33,348	Less : Excess of expenditure over income transferred.	8,87,333
10,16,28,059		13,70,80,815
	<u>V. DONATION CORPUS FUND</u>	
2,12,642	Balance as per last balance sheet.	2,21,743
9,101	Add : Interest received during the year	6,214
2,21,743		2,27,957
0	Less : Returned during the year	2,27,957
2,21,743		—
12,65,73,234	TOTAL (I+II+III+IV+V)	16,27,01,598

WOOL RESEARCH ASSOCIATION, THANE.**SCHEDULE "C"****OUTSTANDING LIABILITIES**

AS ON 31/03/2022 Rs.	PARTICULARS	AS ON 31/03/2023 Rs.
59,47,886	For the year 2017-2018	59,47,886
31,605	For the year 2018-2019	31,605
582	For the year 2020-2021	582
8,40,114	For the year 2021-2022	42,000
	For the year 2022-2023	9,75,243
25,000	Security Deposit (EMD)	25,000
48,35,326	Gratuity provision.	55,34,326
48,09,430	Leave salary provision.	55,98,810
6,60,844	Sundry liabilities (WRA)	8,04,853
1,30,72,663	COE - Sportech	1,32,17,746
—	CWDB - IWDP Schemes	1,60,781
13,42,551	Amount Refundable to MOT	13,42,551
6,83,404	Duties and taxes	2,22,100
	<u>PROJECT LIABILITIES :</u>	
18,32,006	MAVIM Project A/c.	—
18,93,226	Lab Up-Gradation A/c.	10,22,530
3,59,74,637	TOTAL	3,50,26,013

WOOL RESEARCH ASSOCIATION, THANE.
SCHEDULE "D"
ASSETS OF PROJECT (MINISTRY OF TEXTILES)

NAME OF THE PROJECT	PARTICULARS	AS ON 31/03/2022 Rs.	ADDITION DURING THE YEAR Rs.	TAKEN OVER DURING THE YEAR Rs.	ASSETS AS ON 31/03/2023 Rs.
SPENT GRANT					
1) COE - Sportech	Lab equipments/Machinery	21,54,50,989	-	-	21,54,50,989
2) COE - Sportech	Books & Journals	59,50,058	-	-	59,50,058
3) COE - Sportech	IT Infrastructure/Web Site	11,99,237	-	-	11,99,237
4) Dev.and appl.of eco friendly microencapsulated..	Lab equipments	5,06,990	-	5,06,990	-
5) Dev.of high performance,smart sportswear...	Lab equipments	4,18,653	-	4,18,653	-
6) Dev. of innovative sportech products...(Hot melt)	Lab equipments	7,18,697	-	7,18,697	-
7) Development of Membrane Bioreactors	Lab equipments	5,65,921	-	-	5,65,921
8) Dev.of Novel Detergent Formulation for wool	Lab equipments	11,32,800	-	-	11,32,800
9) Dev.of fitness clothing like gym and Yoga wear with...	Lab equipments	4,01,613	-	4,01,613	-
10) Development of sports gears (inner wears, socks, etc)	Lab equipments	4,18,000	-	-	4,18,000
11) Synthesis of water soluble fluorescent colorcasts for....	Lab equipments	3,01,810	-	-	3,01,810
12) MAVIM project	Lab equipments/Furniture	1,58,13,352	49,04,198	-	2,07,17,550
13) Sustainable enhancements of Aesthetic values..	Lab equipments	-	15,508	-	15,508
14) Central Wool Dev. Board (IWDP) Schemes	Lab equipments	-	2,27,349	-	2,27,349
	TOTAL	24,28,78,120	51,47,055	20,45,953	24,59,79,222
NOTE : 1) Grant-in-Aid due has been shown under the head of "Current Assets." 2) Balance in grant shown in liability side is as follows :					
UNSPENT GRANT			CAPITAL	RECURRING	TOTAL (RS.)
a) Sustainable enhancement of Aesthetic values by digital printing			11,25,079	-	11,25,079
b) Dev.of Cost Effective hand made carpets & floor covering...using Jute....			-	4,46,178	4,46,178
c) Development of Membrane Bioreactors as a solution for compact....			3,26,525	-	3,26,525
d) Dev.of Novel Detergent Formulation for wool with immobilized enzymes..			-	1,08,671	1,08,671
TOTAL			14,51,604	5,54,849	20,06,452
TOTAL OF SPENT AND UNSPENT.				TOTAL	24,79,85,674

WOOL RESEARCH ASSOCIATION, THANE.

SCHEDULE 'E' 2022-2023

SR. NO.	PARTICULARS	RATE %	GROSS BLOCK				DEPRECIATION				NET BLOCK	
			AS ON 01.04.2022	ADDITION DURING THE YEAR	DEDUCTION DURING THE YEAR	AS ON 31.3.2023	UP TO 01.04.2022	DEPRECIATION FOR THE YEAR	ADJUSTMENT DUE TO SALE/ LOSS	TOTAL UPTO 31.3.2023	AS ON 31.3.2023	AS ON 31.3.2022
			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1)	LAND		5,83,883	—	—	5,83,883	—	—	—	—	5,83,883	5,83,883
2)	BUILDING (Old)	2.5	26,43,986	—	—	26,43,986	17,28,379	22,890	—	17,51,269	8,92,717	9,15,607
3)	FURNITURE AND FIXTURE	15	8,46,817	—	—	8,46,817	5,84,314	39,375	—	6,23,689	2,23,128	2,62,503
4)	LAB EQUIPMENT	15	46,84,986	21,72,399	—	68,57,385	37,14,354	3,08,525	—	40,22,879	28,34,507	9,70,632
5)	OFFICE EQUIPMENT	15	8,62,674	3,62,842	—	12,25,516	5,29,684	92,245	—	6,21,929	6,03,587	3,32,990
6)	AIRCOND. WDG. PLANT	15	1,77,025	—	—	1,77,025	1,76,955	11	—	1,76,966	60	70
7)	ELECT. INSTALLATION	15	21,73,626	42,500	—	22,16,126	9,07,783	1,93,064	—	11,00,847	11,15,279	12,65,843
8)	LAB FURNISHING	10	14,72,715	—	—	14,72,715	11,00,446	37,227	—	11,37,673	3,35,042	3,72,269
9)	WATER COOLER	15	12,182	—	—	12,182	9,300	432	—	9,732	2,450	2,882
10)	AIR CONDITIONER	15	3,07,543	—	—	3,07,543	2,31,840	11,355	—	2,43,195	64,348	75,703
11)	FIRE FIGHTING EQUIPMENTS	15	59,232	—	—	59,232	44,529	2,206	—	46,735	12,498	14,704
12)	WATER TANK	15	31,600	—	—	31,600	31,420	27	—	31,447	153	180
13)	MOPED (LUNA)	15	11,300	—	—	11,300	11,236	10	—	11,246	54	64
14)	BUILDING (New)	2.5	13,37,551	—	—	13,37,551	6,44,579	17,324	—	6,61,903	6,75,648	6,92,973
15)	BUILDING (WRA'S CONTR. FOR PILOT PLANT)	2.5	7,50,000	—	—	7,50,000	3,61,433	9,714	—	3,71,147	3,78,853	3,88,567
16)	MOTOR CAR (BUS & CAR)	15	24,82,764	—	—	24,82,764	20,20,292	69,371	—	20,89,663	3,93,101	4,62,472
17)	AIR CONDITIONING PLANT FOR COE LAB	15	14,96,477	—	—	14,96,477	10,88,701	61,167	—	11,49,868	3,46,609	4,07,778
18)	CCTV INSTALLATIONS	15	3,10,518	—	—	3,10,518	1,61,249	22,390	—	1,83,639	1,26,879	1,49,269
	Total		2,02,44,880	25,77,741	—	2,2822,622	1,33,46,494	8,87,333	—	1,42,33,827	85,88,795	68,98,389

Note : 1 : Rate of depreciation consistant since 1970-71.

WOOL RESEARCH ASSOCIATION, THANE.**SCHEDULE "E" (1)****PROJECT ASSETS TAKEN OVER ON COMPLETION OF PROJECTS**

SR. NO. (1)	NAME OF THE PRODUCTS (2)	FURNITURE (3)	LAB EQUIPMENTS (4)	AIR CONDITIONER (5)	BUILDING (6)	TOTAL (7)
1	Dying of wool	4,156	30,628	—	—	34,785
2	Blending of wool	7,074	1,36,211	—	—	1,43,285
3	Chemical finishing of carpet	6,622	87,345	—	—	93,967
4	Designing of wool	—	4,49,307	—	—	4,49,307
5	Color Research project	—	54,637	—	—	54,637
6	Carpet Weaving programme	23,997	3,438	—	—	27,435
7	Standardisation of yarn.	—	2,85,481	—	—	2,85,481
8	Computer Aided Designing (Old)	—	5,44,495	—	—	5,44,495
9	Evaluation of Wool Jute.	—	5,00,000	—	—	5,00,000
10	Techno Economic study of shoddy.	—	4,77,130	—	—	4,77,130
11	Development of cheap furnishing.	—	3,00,000	—	—	3,00,000
12	Software for garment designing.	—	9,34,800	—	—	9,34,800
13	Extraction of various dyes.	—	24,255	—	—	24,255
14	CAD for Textiles.	—	10,34,620	—	—	10,34,620
15	To set of norms (Siro Fast)	—	9,93,851	—	—	9,93,851
16	Pilot Plant.	—	—	—	7,50,000	7,50,000
17	Modification of reactive dyeing.	—	2,25,134	—	—	2,25,134
18	Development of Eco-friendly.	—	1,76,956	—	—	1,76,956
19	Eco-Testing Lab.	1,27,829	31,42,640	—	—	32,70,468
20	Angora Rabbit Wool	—	2,05,060	—	—	2,05,060
21	To Investigate the factors.	47,310	1,03,191	—	—	1,50,501
22	To Make the Natural dyeing.	4,400	1,70,601	—	—	1,75,001
23	To Develop the Software.	49,210	1,36,288	—	—	1,85,498
24	Development of Design for carpet.	8,743	4,56,774	—	—	4,65,517
25	Value Added.	11,257	65,112	—	—	76,369
26	Computer Aided Embroidery.	31,131	5,94,775	—	—	6,25,906
27	Development of Instrumental.	1,16,760	12,83,985	—	—	14,00,745
28	To Develop Software Prediction.	—	1,75,350	—	—	1,75,350
29	Role of Enzymes.	—	45,552	—	—	45,552
30	Study of Technical Aspects.	—	25,097	—	—	25,097
31	To Develop Different Type of Knitwear	—	66,062	—	—	66,062
32	To Improve Aesthetics Value	—	1,99,842	—	—	1,99,842
33	Textiles committee	—	64,68,437	—	—	64,68,437
34	To Dev. Innovation Yarn	—	5,50,000	—	—	5,50,000
35	To Dev. Cotton Core	—	2,75,000	—	—	2,75,000
36	Enrichment of Painting	—	2,00,000	—	—	2,00,000
37	Dyeing of Wool	—	50,000	—	—	50,000
38	Information Technology	—	2,89,550	—	—	2,89,550
39	CAD Jaquard	—	2,70,650	—	—	2,70,650
40	Design and Fabricate	—	14,22,816	—	—	14,22,816
41	To Improve Processing	—	7,38,812	—	—	7,38,812
42	UNDP -GOI project	2,25,350	1,17,82,004	1,05,000	25,02,829	1,46,15,183
43	To Develop lch free woollen(Plasma)....	—	12,00,717	—	—	12,00,717
44	Ultra Sound assisted...	—	7,99,191	—	—	7,99,191
45	To asses Quality norms....	—	45,39,900	—	—	45,39,900
46	Blind dyeing..	—	10,64,885	—	—	10,64,885
47	Softening..	—	3,66,593	—	—	3,66,593
48	Preloom processing.....	—	3,46,747	—	—	3,46,747
49	Dev.of Composites....	—	2,15,543	—	—	2,15,543
50	To evolve feasible....	—	51,150	—	—	51,150
51	To Synthesise wool dyes....	—	24,23,882	—	—	24,23,882
52	Dev.of Internet based...	—	37,19,940	—	—	37,19,940
53	Surface Topographical...	—	4,04,438	—	—	4,04,438
54	To Dev.cost effective ETP	—	6,04,685	—	—	6,04,685
55	Efflunet treatment system for Power generation	—	1,50,849	—	—	1,50,849
56	Upgradation of Indian wool	—	12,26,307	—	—	12,26,307
57	Dev.of Thermal Responsive HighAltitude(CWDB)	—	2,12,653	—	—	2,12,653
58	Negative ion finishing for woollen carpets...	—	12,17,367	—	—	12,17,367
59	Dev.of pollutin free and eco-friendly dry scouring.	—	6,49,624	—	—	6,49,624
60	Dev.of Multifunctional finish with anti bacterial..	—	10,63,034	—	—	10,63,034
61	To impart superwash property to Indian wool..	—	2,21,557	—	—	2,21,557
62	UNDP-Panamina Project	—	53,17,564	—	—	53,17,564
63	Dev. Effective & eco-friendly electroflocculation ..	—	8,73,285	—	—	8,73,285
64	Dev.Waterproof Breathable sports wear..	—	4,82,550	—	—	4,82,550
65	Fibre Length Measurment Instrument(DST)	—	4,33,968	—	—	4,33,968
66	Instrumentto Determine...	—	7,65,763	—	—	7,65,763
67	Synthesis & Application of Solar Ultraviolet....	—	10,03,268	—	—	10,03,268
68	Innovation of Bulky yarns of woolenised Jute....	—	7,05,050	—	—	7,05,050
69	To design & develop evaporative cooling textiles	—	4,02,713	—	—	4,02,713
70	Enhancement of Moisture management properties...	—	2,02,960	—	—	2,02,960
71	To develop light sensitive Photo-Chromic Smart	—	57,605	—	—	57,605
72	Design & Dev.of Indian Wool based Smart Textiles...	—	20,66,147	—	—	20,66,147
73	Design & Dev.of India Wool based Tech.Textiles..	—	9,22,630	—	—	9,22,630
74	Lab Upgdadation - Equipments	—	3,59,36,858	—	—	3,59,36,858
75	Dev.and appl.of eco friendly microencapsulated..	—	5,06,990	—	—	5,06,990
76	Dev.of high performance,smart sportswear...	—	4,18,653	—	—	4,18,653
77	Dev. of innovative sportech products...(Hot melt)	—	7,18,697	—	—	7,18,697
78	Dev.of fitness clothing like gym and Yoga wear ..	—	4,01,613	—	—	4,01,613
	Total Rs.	6,63,839	10,66,71,261	1,05,000	32,52,829	11,06,92,929
	WRA Assets.					2,28,22,622
	Project Assets taken over upto 2022-2023.					11,06,92,929
	Assets of existing projects.					24,59,79,222
	TOTAL (Rs.)					37,94,94,772

WOOL RESEARCH ASSOCIATION, THANE.**SCHEDULE "F"**

AS ON 31/03/2022 Rs.	PARTICULARS	AS ON 31/03/2023 Rs.
	<u>FIXED DEPOSITS</u>	
	<u>Corpus Fund/R & D Replacement Fund</u>	
6,38,78,680	Fixed Deposits with State Bank of India	7,76,87,622
2,07,18,144	Fixed Deposits with Central Bank of India	4,11,55,422
24,22,731	Fixed Deposits with Axis Bank	25,07,313
41,65,593	Interest accrued on FD (SBI)	40,17,714
66,238	Interest accrued on FD (CBI)	4,44,608
	<u>CASH & BANK BALANCES</u>	
	5,07,540 Current Account with S.B.I. (A/c. 11100522024) 10,77,500	
	25,010 ESCROW A/c. with S.B.I. (A/c. 32424163025) 24,361	
	6,520 Cash on hand 4,287	
	17,97,482 CWDB Project Account C.B.I. (A/c. 1334639360) 11,37,167	
	1,24,51,669 Central Bank Of India (Testing fees) (A/c. 1334641891) 1,91,37,801	
	411 WRA Trustee's Account. C.B.I. (A/c. 1334698893) 9,556	
	1,67,65,087 MAVIM project A/c. with SBI (A/c. 39012931052) 84,56,956	
	2,52,763 Axis Bank Ltd. (A/c. 061020003285) 11,42,145	
3,18,32,308	25,826 Axis Bank Ltd. (Project; Light weight...) (A/c. 918020094870444) 25,634	3,10,15,407
	MAVIM Project A/c.	11,88,997
	<u>SUNDRY DEBTORS.</u>	
42,89,578	Testing Fees outstanding considered good	64,41,869
	<u>OUTSTANDING SUBSCRIPTION</u>	
	5,750 Considered Good for the year (2017-2018) --	
	5,900 Considered Good for the year (2018-2019) --	
	1,02,090 Considered Good for the year (2019-2020) --	
	87,618 Considered Good for the year (2020-2021) 81,018	
3,14,998	1,13,640 Considered Good for the year (2021-2022) 81,018	
	-- Considered Good for the year (2022-2023) 86,518	2,48,554
12,76,88,271	TOTAL	16,47,07,506

WOOL RESEARCH ASSOCIATION, THANE.**SCHEDULE "G"****ADVANCE RECOVERABLE**

AS ON 31/03/2022 Rs.	PARTICULARS	AS ON 31/03/2023 Rs.
4,44,128	Deposits with MSEDCL/TMC etc..	5,76,928
31,81,287	Gratuity fund with L.I.C. of India	49,12,191
4,54,530	Other Advances	3,13,098
23,54,575	Service tax and Krishi Kalyan cess paid in advance/ GST	--
2,97,828	Prepaid expenses	2,36,828
1,97,498	TDS Receivable (10-11)	1,97,498
11,03,035	TDS Receivable (20-21)	--
23,32,006	TDS Receivable (21-22)	--
--	TDS Receivable (22-23)	30,42,050
1,03,64,886	TOTAL	92,78,593

WOOL RESEARCH ASSOCIATION, THANE.
SCHEDULE "H"
CURRENT ASSETS (PROJECT)

AS ON 31/03/2022 Rs.	PARTICULARS	AS ON 31/03/2023 Rs.
	<u>GRANT-IN-AID DUE FOR RECURRING EXPENSES.</u>	
11,69,881	Dev.waterproof breathable sportswear....	2,86,131
12,27,674	Dev. effective & eco-friendly electroflocculation ..	12,27,674
12,38,790	Dev.of keratin based bio-composite fils and electro spun..	12,38,790
15,53,475	Dev.smart indigenous sleeping bag with heating property..	4,52,625
13,54,516	Synthesis & Application of Solar Ultraviolet	13,54,516
19,75,150	Dev.of high performance,smart sportswear...	19,75,150
17,34,744	To develop light sensitive Photo-Chromic Smart	17,34,744
11,95,275	To design & develop evaporative cooling textiles	11,95,275
10,90,565	Development of Membrane Bioreactors as a solution for compact....	0.00
11,08,155	Enhancement of Moisture management properties of polyester....	11,08,166
12,46,359	Development and application of eco friendly microencapsulated moth..	0.00
13,42,071	Dev. of innovative sportech products...(Hot melt)	0.00
13,67,235	Development of sports gears (inner wears,socks,bands,leggiings ets.)	97,115
17,39,674	Dev.of Novel Detergent Formulation for wool with immobilized enzymes..	0.00
12,86,602	Synthesis of optical whiteners with good photostability	0.00
17,37,236	Dev.of fitness clothing like gym and Yoga wear with	0.00
26,52,029	Synthesis of water soluble fluroscent colorants for	32,55,129
6,34,373	Design & Dev.of sportswear having Thermo Physiology..	1,94,367
6,68,864	Design & Dev.of Light weight and high impact resistance sport goods	6,62,744
0.00	Indian Technical Textile Association (ITTA)	1,50,577
2,63,22,665	TOTAL	1,49,33,001

WOOL RESEARCH ASSOCIATION, THANE.**SCHEDULE "I"****STAFF SALARIES**

AS ON 31/03/2022 Rs.	PARTICULARS	AS ON 31/03/2023 Rs.
2,29,27,246	Salaries & Allowances (Includes PF/FPF, ADMN. charges & EDLIS premiums)	2,32,75,517
2,052	Maharashtra Labour Welfare Fund.	1,044
42,464	Staff Medical Expenses.	43,367
5,34,493	Staff Welfare Expenses	5,40,570
27,903	Staff Leave Travel Concession.	51,999
11,98,511	Group Gratuity Scheme	16,28,866
2,47,32,668	TOTAL	2,55,41,363

WOOL RESEARCH ASSOCIATION, THANE.**SCHEDULE “J”****ESTABLISHMENT CHARGES**

AS ON 31/03/2022 Rs.	PARTICULARS	AS ON 31/03/2023 Rs.
2,30,022	Printing & Stationery.	2,99,345
2,39,582	Postage, Telegram & Telephones.	2,26,848
23,70,918	Electricity & Water Charges.	27,74,526
10,800	Advertisement & Publicity	31,900
45,98,293	Repairs & Maintenance	54,14,428
27,125	Rates & Taxes.	27,125
2,86,738	Insurance Exps.	3,00,629
3,50,318	Conveyance & Travelling.	11,81,755
5,179	Entertainment Exps.	40,341
19,599	Bank Charges.	20,592
2,000	Journals & Periodicals.	10,500
34,500	Subscription to the other Association.	46,250
1,15,063	Miscellaneous exps.	2,87,199
9,97,325	Security Service Charges.	10,24,934
5,98,352	Motor car exps.	8,09,980
7,18,170	Professional charges.	8,31,653
14,49,683	Testing charges.	18,70,964
12,10,721	Labour charges/wages to casual workers	11,66,001
4,309	Interest on delay payments/GST liabilities etc.	3,004
	Discount Allowed	9,345
2,500	Employer's contribution to MPT	2,500
1,32,71,197	TOTAL	1,63,79,819

WOOL RESEARCH ASSOCIATION, THANE.**SCHEDULE “K”****INCOME**

AS ON 31/03/2022 Rs.	PARTICULARS	AS ON 31/03/2023 Rs.
3,21,117	Members Subscription.	3,27,718
3,22,45,936	Testing Fees Income.	4,18,32,499
79,84,778	Consultancy Service charges and R & D	1,03,11,592
1,34,289	Miscellaneous receipts.	1,49,197
10,000	Educational & Technical Training ...	--
42,29,555	Interest on Fixed Deposites.	55,38,732
2,13,478	Interest credited by LIC for Gratuity fund	2,61,905
–	Interest on Income Tax Refund	2,50,285
–	Foreign Exchange Gain	4,40,810
4,51,39,152	TOTAL	5,91,12,738
2,73,12,566	Less: Transferred to Corpus Fund	3,63,40,089
1,78,26,586	Transferred to Income & Expenditure A/c.towards Industry's contribution	2,27,72,648

WOOL RESEARCH ASSOCIATION

SCHEDULE 'L'

NOTE ON ACCOUNTS

1. Significant Accounting Policies

Accounts have been prepared under the historical cost convention. The significant account policies are as under:

- a. Fixed Assets: Fixed assets are stated at cost of acquisition inclusive of expenses relating to acquisition.
- b. Depreciation: Depreciation is provided on Assts acquired by the Association, out of its own funds by the WDV method at the following rates.

Building	-	2.5 %
Furniture, Fixtures & Equipments	-	15 %
Furnishing	-	10 %
- c. Investment: Investments acquired out of donation from members are valued at cost of acquisition.
- d. Inventory: Consumable items such as Laboratory chemicals and Wool Consumables, Color Software development and computer stationery and other consumables purchased during the year are treated as consumed during the year.
- e. Retirement Benefits
 - i. Provident fund contribution is funded with Regional Provident Fund Commissioner.
 - ii. Provision of Leave Salary:
Provision of leave salary is made by the Association on the basis of leave accumulated to the credit of employee at the year end.
 - iii. Liability for gratuity is provided on the basis of calculation made by the Association as per the payment of Gratuity Act, 1972 on Balance Sheet date. However, valuation has been estimated by the WRA at Rs. 55,34,326.15 The premium paid to LIC for the Group Gratuity Trust is shown as Deposits as Rs. 49,12,191.30.
- f. Foreign currency transaction: All foreign currency transaction during the year are converted at the standard rate as specified by Grant Sanctioning Authority.
- g. Grant-inAid :
 - 1) Grant-in-aid from Government authorities is accounted for on the basis of amount sanctioned.

- 2) Grant-in-aid for recurring expenses (WRA as well as specific projects) is adjusted as and when the expenses are incurred.
 - 3) Grant-in-aid of Capital nature on WRA account is transferred to capital fund on purchase of fixed assets.
- h) a) Interest on Fixed Deposits is accounted for on accrual basis and is shown under income
- b) Subscription and testing fees are accounted for on accrual basis and consultancy service charges and other income are accounted for on receipt basis and the same is first utilized for off setting the industry's contribution to meet capital expenses as well as revenue expenses and the balance has been transferred to R & D Replacement Fund.
- i) Corpus Fund :
- As per Ministry of Textiles O.M. No. 20/21/98/A & MMT dated 9th September, 1998 – Minutes of the 13th Meeting of the Co-ordination Council for Textile Research Association (TRA) held on 11th August, 1998. TRAs' are authorized to retain 100 % of the earned income by building a Corpus Fund from such retained income and utilize interest from such Corpus Fund to meet their need based requirement.
- j) Education Fund :
- Education fund has been created out of donation received for the purpose of enhancing the educational facilities at Training Centre and improving the level of training.
- k) Donation Corpus Fund :
- As per the decision taken in the 148th Governing Council Meeting, Donation Corpus fund has been created from the Donation received from Ex. Director, Shri M.K. Bardhan for giving reward to the best Paper published by WRA staff from the interest earned from the fund. As the amount was not utilized, request letter was received from Shri M.K Bardhan on 29th June, 2022 to refund the same Subsequently after the approval of president on 29th June, 2022 it was decided to refund the donation amount to Shri M.K Bardhan alongwith interest and accordingly Rs.2,27,957/- was refunded during the year.
- l) All expenses are accounted for on accrual basis. Allocation of various recurring expenses to the various projects is done on the basis determined by the Management.
- 2 a) In the opinion of the Governing Council, subject to these note, current assets, loan and advances, including grant receivable, have value on realization in the ordinary course of activities of the Association, not less than at which these are stated in the Balance Sheet, except subscription and testing fees of previous years which may prove irrevocable for which no provision has been made. Provision for all known liabilities has been made in the accounts and the same is not in excess of what is reasonably necessary.
- b) During the year the management has carried out physical verification of fixed assets. However there are some discrepancies found with book record and the management is in the process of reconciling the same with book record.

3. No confirmations from creditors, deposits and in respect of loan and advances have been obtained. Confirmations in respect of debtors, fixed deposits placed with banks are being obtained. WRA is in the process of reconciliation of Goods and Service Tax (GST) balances as per books of accounts and as per GST returns filed.
4. The provision of subscription receivable from ordinary and Special associate members and the details of the installed capacity of the member mills on the basis of which calculation of subscription is made is as prepared by the management and is relied upon by the auditors without verification for want of relevant records.
5. The mutual adjustment of grant for capital to revenue and vice versa are made and not yet confirmed by the granting authorities for relevant years.
6. Investment in M/s Gujarat Sheep & Wool Development Corpn. Ltd. Rs. 11,56,400/- represent the contribution from industry through WRA in sheep breeding program of M/s Gusheel. Audited Accounts of Company are still awaited. In the absence of audited accounts, the net worth, diminution in value of investment can not be ascertained.
7. The apportionment of staff salaries, freight charges, raw material, traveling, spares and other overheads including testing charges between the Association and various projects is made as per the advice from the respective project-in-charge/Director in this regard.
8. Depreciation on fixed assets amounting to Rs. 8,87,333/- for the current year (Previous year Rs. 7,73,348/-) on WRA assets has been provided for and shown under depreciation reserve.
9. Impairment of Assets.
The carrying amount of assets, other than inventories is reviewed at each balance sheet date to assess whether there is any indication of impairment in respect of such asset or group of assets. If such indication exists, the recoverable amounts of such assets or group of assets is estimated. If such recoverable amount of asset or group of assets is less than its carrying amount, an impairment loss is reckoned by reducing the carrying amount to its recoverable amount. If there is an indication at the balance sheet date that the previously assessed impairment loss no longer exists, the recoverable amount is reassessed and the asset is reflected at the recoverable amount subject to a maximum of depreciable historical costs.
10. Fixed Assets: The Association has purchased/taken over assets worth , Rs.51.47 Lakhs, Rs. 25.77 Lakhs and Rs. 110.69 lakhs as on 31.03.2023 out of the Projects funded by MOT, COE Sportech Project, MAVIM and other agencies respectively. These assets are being used by the Association to carry out the activities. However, no depreciation has been provided during the year as well as during the earlier years on such assets. The impact of depreciation is not quantified.
11. The Association has not identified the creditors having registration under Micro, Small and Medium Enterprises Act 2006 and the Small Scale Industries Act. Hence the disclosure as required is not made in the accounts.
12. During the year, excess expenditure incurred on project of Rs. 89,908/- has been shown as project cost incurred by WRA as expenditure of WRA.

13. Assets Of Bikaner and Kullu purchased by WRA : As per the sanction letter received from Central Wool Development Board, Ministry of Textiles, the WRA is implementing agency for the "Upgradation and strengthening of existing Wool Testing Laboratory of CWDB at Bikaner and Kullu". Fixed assets are purchased for this project which are not recorded as "Fixed Assets" in the Books of WRA and the same is shown under amount spent for the project.
14. Previous year figures are re-grouped/re-arranged wherever necessary to make them comparable with those of current years.

SIGNATURES TO SCHEDULES 'A' TO 'L'

FOR J.P.J.ASSOCIATES LLP
 CHARTERED ACCOUNTANTS
 FIRM REG.NO. 113012 W/W100296

For & on behalf of the
 GOVERNING COUNCIL

Sd/-

VAIBHAV VAIDYA
 PARTNER
 MEM. NO. 157754

Sd/-

H.K. CHATTERJEE
 PRESIDENT

Sd/-

R.V. BHANDARKAR
 SR. ACCOUNTS OFFICER

Sd/-

K. K. MISRA
 DIRECTOR (OFFICIATING) & COO

PLACE : MUMBAI
 DATE : 24/08/2023