ICAR-National Institute of Research on Jute & Allied Fibre Technology
12, Regent Park, Kolkata-700040

राष्ट्रीय पटसन एवं समवर्गी रेशा प्रौद्योगिकी अनुसंधान संस्थान

12, रीजेन्ट पार्क, कोलकाता - 700040

1. Full Name: Dr Dinesh Babu Shakyawar
2. Educational Qualification: PhD (Textile Engineering) IIT Delhi
3. Designation: Director
4. ARS Discipline: Textile Manufacture
5. Date of joining in ICAR: 11.11.1992
6. Date of Joining in ICAR-NINFET: 21.09.2020
7. Working experiences (in years)
    a. Research: 27 years
    b. Teaching: 6 years
    c. Management: 6 Years
8. Area of work
    i. Significant contribution for developing technologies for PCR based technique for identification of pashmina to check adulteration; and fabrication of Innovative charkha for efficient and quality yarn from pashmina and blended fibres.
    ii. Standardized technologies for Fine wool-Angora wool blended shawl; sapling bags; and quilt from coarse sheep wool; and wool based composites for insulated and Fire resistance wall panels. Method for lusture measurement of wool and other fibres.
    iii. Professionally contributed for development "Natural fibre based engineered leather alernatives" which will be game changer for jute and other natural fibre growers. The flexible composite material is found significant importance to reduce environmental impact minimizing use of water and reduction in water pollutants hazardous nature chemicals. Ultimately reduces health hazard of human kind on the earth.
    iv. Established a method for keratin extraction from coarse/waste wool which will potential technology for medical, cosmetics industry.
    v. Notable contribution includes in the field of natural dyes as anti-moth, UV protection, development of handicraft product from hand-made felt made of coarse wool; optimum blends for woollen blankets and wool waste as organic fertilizer. The research also carried out on nano particles synthetization using bio-based broth for dyeing of cotton/wool using natural dyes.
    vi. Research contribution made for development of equipments using Computer Aided design and automation which lead to reduce drudgery and also make machine gender friendly. Further research conducted on identification of defect and lusture value using instruments lead to accuracy, quick estimation and manual error.
    vii. Chairman of Sectional committee (TXD 04) on wool and woollen products of Bureau of Indian Standard (BIS) has played critical role to publish New Standards: **IS 17269:2019** - Identification, Labeling and Marking of Pashmina Products; and **IS 19218 :2023** Textile Floor coverings carpet tiles made of synthetic fibres: Specification.
9. Contact details
    a. Mobile No. 7355470602
    b. Email (Including ICAR email) : dbshkyawar67@gmail.com, dinesh.shakyawar@icar.gov.in, dineshshakyawar-icar@icar.org.in
10. Number of project completed (As PI)

Name of the project	Level of association (PI/Co-PI / Associate)	Sponsoring Organization	Duration
BPT/MP-24 : Study of soil hydrothermal environment under natural vs synthetic mulch	Co-PI	ICAR	Oct 2020-March 2022

Green chemistry approachs for dyeing and functional finishing of woollens	Co-PI	ICAR	July 2019-Sept 2020
Textile engineering interventions for effective use of coarse wool and development of eco-friendly woollen products Institute Project Code: TMTC/1/01/17-20	Co-PI	ICAR	23/11/2017 to 20.09.2020
Improvement in productivity of sheep and transferable technology and their impact analysis (TOT/01/01/17-20	Co-PI	ICAR	1/04/2018 to 20.09.2020
Program: Development and Improvement of Technology for value addition in sheep and rabbit products: Project 1: Development of Diversified Animal Fibre Based Value-Added Products PI: D B Shakyawar CoPI (s): A S M Raja, Ajay Kumar and VV Kadam	PI	ICAR	1/10/2012 to 20/11/2014
Project 2: Development of Nano and Bio Technologies Based Functional Chemical Finishing Processes to Wool and Other Animal Fibres PI: A S M Raja, CoPI (s): D B Shakyawar, Ajay Kumar and VV Kadam	Co-PI	ICAR	01/10/2012 to 20/11/2014
Program: Validation, refinement and dissemination of developed technologies: Project: Integrated approach for improvement in productivity of sheep and rabbit under filed condition through transferable technologies	Associate	ICAR	1/04/2012 to Nov. 2014
Development of Carpet pile, Technical textiles and Apparels utilizing indigenous wool blends	Co-PI	ICAR	01/04/2008 to 31/03/2012
Integrated approach for improvement in productivity of sheep and rabbit under filed condition through transferable technologies Sub project: Improvement in wool utilisation through indigenous wool products developed by local artisans CoPI: N P Gupta, Associate: R K Arora & D B Shakyawar	Associate	ICAR	1/04/2008 to 31/03/2012
Post harvest technologies for value added products utilising Indian wool & speciality hair fibres	Co-PI	ICAR	01/04/2003 to Sept. 2007
Demonstration unit of Bharat merino and Avikalin sheep (Co-PI)	Co-PI	ICAR	Dec. 2006-Sept. 2007
Operational Research Project on Transfer of Technology for Improvement in sheep, rabbits and Wool production (Co-PI)	Co-PI	ICAR	Dec. 2006-Sept. 2007
Processing & Product development of wool & speciality hair	Associate	ICAR	1/04/2001 to 31/03/2004

Processing and product development utilising indigenous wool and speciality hair (TXT/1/03)	Co-PI	ICAR	Jan.1994-Dec. 1996

Externally Funded Projects			
Title of the Project	**Level of Association (PI/CCPI/CoPI /Associate)**	**Value of the Project (Rs. in lakhs)**	**Sponsoring Agency**
PDQA/CWDB/2022-12: Upscaling of an eco-friendly microbial extraction method of keratin from waste wool and its technical applications	Co-PI	CWDB	Sept 2022-cont.
PDQA/CRP-NINFET-08/2021-06: Development of natural fibre based vegan leather products.	Co-PI	CRP-NF	April 2022-Cont.
NTTM/2023-02: Natural fibre waste to planting growth media: development characterization and evaluation in soilless crop production system "	Co-PI	NTTM	Nov. 2023 to Cont.
BPU/IICT-Consulatancy project/2022-09: Utilisation of natural locally available natural resources for natural dyeing of silk and woollen yarn along with pashmina fabric	PI	IICT	July 2022-March 2024
Development of coarse wool based composite	Co-PI	CWDB	March 2020 to Sept 2020
Agri-business incubation, ICAR-CSWRI	PI	NIAF	Oct 2019-Sept 2020
Engineering of Hi-value textiles from the blends of wool, camel, pashmina and Angora rabbit hair	PI	CRP on NF	April 2020-Sept 2020
NAIP: A value chain on quality production and utilization of Pashmina fiber (28/01/2009 to 30/06/2014)	CCPI	270.46	NAIP
Development of portable intelligent wool fibre analyser (2013-14 to 2015-16)	Co-PI	25.52	CWDB
Development of upgraded utilisation techniques for wool produced in southern peninsular region of the country - Sponsored	Principal Investigator	17.46 + 12.54 =30.00	CWDB

by Central Wool Development Board (Aug. 2010 to Aug. 2012)			
KVIC sponsored project: Alternate indigenous wool in place of imported fine wool (Dec. 2011 to 31.03/2014)	Principal Investigator	11.86 CSWRI +11.86 (IITD) = 23.61 lakhs	KVIC
Processing of different hair for value added products (Feb. 2000 March 2005)	Project Associate		NATP
Development of cotton-wool blended yarns employing short staple spinning systems for production of fabrics	Project Associate	Oct 2001 to June 2002	ICAR-Adhoc

11. Professional Achievements (Awards / Best Papers/Appreciation)
    i. Fellow of Institution of Engineers (2016) Institution of Engineers, Kolkotta
    ii. Fellow of ISSGPU (2019) Indian Society of Sheep and Goat Production and Utilisation (Regn. No. 374/81-82 dated 4.01.1982
12. List of publication (Numbers only)
    a. Research papers in National journal (NAAS rated): 50
    b. Research papers in International journal (NAAS rated) : 40
    c. Popular articles : 40
    d. Book Chapter: 15
    e. Books Edited /Authored : 5

Sl. No.	Authors	Title	Year of publication	Original/ Edited	Publisher
1.	Karim, S. A., Shakyawar, D.B. and Anil Joshi	Wool Technology (ISBN No. 978-81-8321-152-9)	2009	Edited	Agrotech Publishing Academy, Udaipur
2.	Karim, S. A., Joshi Anil, Sankhyan S K, Sinde A K, Shakyawar, D.B. Naqvi SMK and Tripathi B N	Sheep and Goat Production (ISBN No. 818930481X)	2010	Edited	Satish Serial Publishing House, Delhi
3.	Kadam V V, Gadekar Y K, Shakyawar D B and Shinde A K	Wool, Mutton and Milk (ISBN 978-93-5391-Sheep Produce: 056-3) p-184	2019	Edited	ICAR-CSWRI Avikanagar
4.	K K Samanta, L K Nayak, S N Chattopadhyaya, A N Roy, M Bhoumick, D B Shakyawar	Banana Plant: Textile ad Non Textile Application (978-81-19006-16-8) PP 120	2023	Original	New DElhi Publishers
5.	D B Shakyawar and Mukesh Kumar Singh	वस्त्र रेशे : उत्पादन, विशेषताएं (978-81-8247-918-0, pp 225	2022	Original	अभिषेक पब्लिकेशन्स
6.	D B Shakyawar, D P Ray, N Mridha, S Basak & S B Roy (Original)	ICAR-NINFET -A profile :A status Report (1938-2022) Copy right no. 2567/2022-CO/L pp 110	2022	Original	ICAR-NINFET Kolkata

f. Seminar Papers: 122
g. Bulletin : 5

13. Seminar presentation (numbers only)
    a. Invited papers: 25
    b. Research papers: 50
14. Patents granted (Numbers only): 5

SNo.	Technology	Developer/Co-developer/ Associate	Patent / Standard No.
1.	PCR Based Technique For Pashmina (Cashmere) Fibre For Identification And Differentiation From Processed Textile Materials.	Developer	340284 (Granted)
2.	Coarse Wool Fabric Reinforced High Strength Composite And Its Preparation Process	Co-Developer	202011049589
3.	Fabrication Of Innovative Table Top Paddle Operated Charkha For Cashmere (Pashmina) Fibre	Developer	358378
4.	Wool Sapling Bag And Method For Preparing The Same	Co-developer	202111028534
5.	A Quilt Comforter And A Method For Preparing The Same	Developer	2021110110700

15. Patent Filed (Five)

SNo.	Technology	Developer/Co-developer/ Associate	Patent / Standard No.
1.	Microbial Keratin Solubilization From Animal Hair – A Method Thereof	Co-Developer	EMP/E1/43918/2022-KOL
2.	Ninfet-Jute Leaf Drink Technology	Co-developer	202231008472 Dated : 17.02.2022 PCT/IN2022/050608 Dated 01-07-2022
3.	A Method of Lustre Measurement of Textile Fibre And A Mounting Platform	Co-developer	TEMP/E-1/11524/2021-DEL
4.	Natural Fibre Based Artificial Leather: An Alternative Of Leather, Sustainable And Biodegradable Product	Co-developer	TEMP/E-1/149/2023-KOL

5.	A Lignocellulosic Fibre Pre-Treatment Formulation and Process For Improving Spinnability of Ligno-Cellulosic Fibres	Co-developer	202431001113

16. Technology Commercialised (five with details)

SNo.	Technology	Detail
1.	**Angora Rabbit-Bharat merino wool blended Shawl**	• The blend level of Angora hair and Bharat merino wool has been optimized in the ratio of 70:30. • Angora hair is blended with Bharat merino wool using modified cotton card. The blends were then processed into yarn using semi worsted system using gill box, roving frame and worsted ring frame. Shawls were developed from blends of Angora rabbit hair and Bharat Merino wool using proportion of Angora rabbit hair (30%): Bharat merino wool (70%) using 3/1 twill weave pattern on handloom. A process for improving whiteness and softness of Angora rabbit hair: Bharat merino wool blended shawl was developed using H_2O_2 for bleaching followed by finishing with cationic softener. • The processed shawl shows 30% higher whiteness and 20% improved softness and significant reduction in pilling as as compared to conventionally processed shawl.
2.	**Natural Colours for wool and speciality hair fibres**	Extractions of colourant and application process on the wool and specialty hair fabrics are optimized. Shawls made of wool and speciality hair fibres, especially, pashmina can be dyed compressively with natural dyes in all colours with good fastness properties. The technology has been demonstrated to dyeing industries, pashmina processing artisans of Srinagar, Kullu, jaipur etc. Pant woolen mills Hurla, Bhunter, Kullu, faculty members of Indian Institute of Craft and Design, Jaipur. Colour obtained from new sources like saffron, silver oak, onion skin, dhol kanali, Indian Barberry have greater acceptability among costomer.
3.	**Innovative technique for anti-moth finishing of pashmina shawl**	• An innovative technique developed to use natural dyes as antimoth finishing process to Pashmina / wool shawl. The use of natural dyes is considered as ecofriendly and can impart antimoth efficacy. • The aqueous extracts of saffron flower waste, onion skin, henna, myrobolan, silver oak leaf, madder, wall nut, dhol kanali and yellow root were used as natural dye sources. The scoured fabrics were then dyed with 5% colorant (owm) at 90°C with 1:40 material to liquor ratio at pH 5-6 in presence of 0.5 gpL acetic acid solution for one hour in a water bath. • Silver oak leaves, pomegranate rind, wall nut husk extract contain more than 40% tannin show better

		antimoth efficacy on Pashmina shawl. The amount of tannin present in the selected natural dyes is as following descending order: silver oak leaves > pomegranate rind > walnut husk > madder > henna > saffron > onion.
4.	**PCR based technique for Pashmina (Cashmere) fibre for identification and differentiation from processed textile materials.** (Patent granted : 3400/ DEL/2012)	• Identification of falsification/imitation of pashmina shawls with other animal fibres viz; wool, rabbit wool etc was not possible because of their similar chemical nature. This falsification has badly damaged the shawl industry as imitated shawls are being sold in the market in the name of pashmina shawls. • This invention is related to the extraction of high quality DNA from processed textile products and species specific identification of goat (Pashmina) and sheep(wool) origin fibres by qualitative PCR based method. • A technique to extract intact DNA from the processed cashmere fibre by using PCR based DNA sequencing method has been standardized. By this method, falsification/imitation of pure pashmina with wool up to 10% can be detected. Further validation to improve its efficiency up to 1% is under process.
5.	• **Fabrication of Innovative Table Top paddle operated Charkha for Cashmere (Pashmina) fibre) (Patent No. 3616/DEL/2011)**	• Improvised charkha comprises of table top, small spinning wheel spindle and foot paddle. The spinner sits on the stool and operates the charkha with her foot. The improvised /innovative charkha were distributed among beneficiary spinners in Kashmir, Ladakh and Palampur. • The innovative charkha performed excellently with spinning loss of only 3% as against 12% in case of traditional one. The field results have shown that innovative charkha is proving efficient in terms of time consumed for spinning by 73.50% over traditional one besides decreasing physical drudgery. In terms of income, there is an increase of 146.64% (Rs 1638 to Rs 4040) remuneration over traditional one for same period of time without deteriorating the quality of yarn. • In terms of income, on an average, there has been an increase of 146.64% (Rs 1638 to Rs 4040) remuneration over traditional one for same period of time without deteriorating the quality of yarn. Reduction in physical stress.
6.	**Utilisation of Indian crossbred wool in decentralized kahdi sector**	• Indian wool characterised for physiomechanical properties. • The crossbred wool are preprocessed on khadi system and yarn of 24Nm prepared

		• The developed yarns woven into woven, knitwear and union fabrics using handloom/ hand knitted machine. • Dyeing and chemical finishing techniques are optimised for crossbred wool blended products • The products are well recognized by KVIC for wool-cott knitwear and wool-cotton union fabrics, which are suitable for trans-seasonal fabrics.
7.	Development of woollen sapling bag (Patent-202111028534)	Sapling/grow bag is made of generally coarse wool having a fibre diameter of size > 35 micron which is biodegradable material but with slow rate of degradation. Sapling bag provide significantly high plant germination and growth than the synthetic bag at the similar experimental conditions. • It has water retention of more than 50% of its own weight and moisture content of 13% and regain of of 16% • It release > 6% of nitrogen upon degradation • Sapling bag has high air permeability (30-70 $cm^3/cm^2/s$) and high water vapour transmission with apparent opening size (> 0.4 mm) • It is dimensional stable at least 03 months in the soil
8.	**Microbe Mediated Keratin Extraction from Animal Hair**	• A keratinase positive bacterial strain, AR has been identified to solubilize keratin from coarse wool and hair under specified conditions. Bacterial culture grown with trimmed wool and incubated. Solubilized material is then centrifuged to remove undissolved material and bacterial cell debris. The clear super supernatant is precipitated as keratin protein • Patent Application No. 202231038894 filed on 2021 • Certified technology as ICAR-AE- NINFET- Technology -2023 -031. • The green method gives 56% solubilization of coarse sheep wool in comparison with conventional chemical method • The lyophilized protein can be used for cosmetic, medical & functional textiles applications
9.	**Natural Fibre based artificial leather**	• Natural fibre based flexible composite developed from needle punched natural fibre based non-woven fabric and coated with and cured at 140°C for 3-4 min with high pressure of 80kg/cm^2 for vulcanization of rubber coating on the fibre surface. Dried composite material could be embossed at high pressure at around 70-80kg/cm^2 for getting more smoothness and shiny effect. • Patent Application No. 202331000115 field on 2022 • Certified technology as ICAR-AE-NINFET- Technology -2023 -034

		• A sustainable method to develop natural fibre engineerd leather alternative products • Natural fibre based rubberized flexural composites have been used to make artificial leather-based life style products
10.	Coarse Wool Fabric Reinforced High Strength Composite	• Methodologies to develop rigid, functional and light weight coarse fibre based high strength composite for the replacement of glass fibre based composites by hand laying -cum-compression moulding method for the development of composite which have the desirable properties of mould products for different industrial applications • Patent granted 202011049589 • The main advantage would be reduction in the weight (12-30%) and the cost (5-10%) of the final product in comparison with glass fibre based composite products • They can be utilized in constructional (as corrugated sheet), furniture (different table top, false roof, divider) and automobile sector (interim trim & dashboard) for acoustic and thermal insulator application
11.	**NINFET-Jute Leaf Drink Technology**	• Jute leaf has rich in antioxidant properties, wide arena of DPPH, FRAP and ABTS scavenging properties. A commercial scale protocol has been developed for preparation of jute leaf based drinks (like tea) with the financial support of National Jute Board, Ministry of Textiles, Govt. of India using jute leaves • Patent filed No. E-1/9638/2022- KOL • Registered under FSSAI No. 22821042000998 • Certified technology as ICAR-AE- NINFET- Technology -2023 -036 • The **NINFET-JLD** is a unique beverage with good antioxidants and refreshing properties • The farmer friendly approach has opened a new vista for harnessing additional income from conventional jute growing systems.
12.	**Development of a ribbon extractor for multi-bast fibrous crops**	• ICAR-NINFET has developed a multi-fibre extractor with capacity in the range of 1050 to 1200 kg/h whereas the extraction efficiency was achieved in the range of 88 to 93%. The average energy requirement of the machine is 1.34 kWh (at load). • It helps to reduce the water requirement and retting duration by 50 % and 10 days respectively as compared to the conventional retting process

		• Green and dried fibre yielding can be decorticated and extracted into fibre and the residuals can be used for partiel board production
13.	Wool Sapling Bag And Method For Preparing	A sapling bag made of wool comprising a body that has a substrate region defined between an opened top and a closed bottom. The opened top is configured to receive substrate in the substrate region to grow the plant. Further, the body comprises one or more walls that enclose the substrate region. Further, the sapling bag comprises a plurality of pores that are defined in the one or more walls of the body. The plurality of pores is configured to pass air or moisture from the one or more walls of the body. Furthermore, the one or more walls of the body are made of coarse wool. The one or more walls made of coarse wool has fibre diameter of size greater than 35 microns. Accordingly, the sapling bag is biodegradable, recyclable, and disposable. The degradation rate of the sapling bag is slow i.e. around 3 months. Even after degradation, the coarse wool sapling bag offers nitrogen to the soil 20 which enhances the fertility of the soil in which the sapling bag is buried. The sapling bag ensures moisture retention of more than 50%, with a moisture content of 13%, and moisture regains of 16%. The seed germination rate of the present coarse wool sapling bag is higher than 50% as compared to the conventional plastic bags. Patent application : 202111028534 Patent No. 434645 Commercialisation: MoU signed with Orgo Fibre LLP Vadodara

14. List the five major achievements in the career
    a. Chairman (TXD04)Wool and Woollen Product, BIS New Delhi (2028-cont.)
    b. Chairman Textile Engineering Divisional Sub Committee of West Bengal Center (2022-23)
    c. Director UPTTI and HBTI Technical Education UP (2014-17)
    d. Patented work on Pashmina identification has find place in new BIS **standard test method: IS 17269:2019 -** Identification, Labeling and Marking of Pashmina Products
    e. Supervisor for M Tech/ PhD work by AKTU, Lucknow, PTU Bhatinda, Rajasthan University, Jaipur, Bansthali Vidyapeeth, IIS University, Jaipur, MPUAT Udaipur.

15. List the publications

Sl. No.	Details of Publications in the format given above	NAAS Journal ID (2024)

		and (Score)
1.	Ammayappan L and Shakyawar D B (2016) Dyeing of Carpet Woolen Yarn using Natural Dye from Cochineal, Journal of Natural Fibers, 13:1, 42-53	J410 (9.50)
2.	Ammayappan L., Shakyawar D.B and Gupta NP (2011) Optimization of dyeing condition for wool/cotton union fabric with direct dye using box-behnken design, Fibres & Polymers, 12(7), 957-962	F010 (8.50)
3.	Basak S, DB Shakyawar, Kartick K Samanta, Sanjoy Debnath, M Bhowmick, Niranjan Kumar (2022), Development of natural fibre based flexural composite: A sustainable mimic of natural leather , Materials Today Communications 32, 103976	-- (9.662)
4.	Basak, S., Shakyawar, D.B., Samanta, K.K., Niranjan Kumar, Bhowmick, M., Debnath, S., Ghosh, R.K., Manjunatha, B.S., Ghosh, S., Mustafa, I., Kadam, V., (2023) Cellulose-protein blended sustainable biodegradable flexible composite: a step towards a leather alternative, Cellulose https://doi.org/10.1007/s10570-023-05547-4.	C061 (11.70)
5.	Behera B K &Shakyawar D B (2000) Structure-property relationship of fibre, yarn and fabric with special reference to low stress-mechanical properties and hand value of the fabric Indian J of Fibre & Text Res, 25 (3) 232-237	I066 (6.60)
6.	Borah M P, Seiko Jose, Kalita B B, Shakyawar DB, Pandit Pintu (2020), Water repellent finishing on eri silk fabric using nano silica, The Journal of the Textile Institute, 111 (5), 701-708, doi.org/10.1080/00405000.2019.1659470	T046 (7.70)
7.	Gangwar AKS, Shakyawar DB, Singh MK, Vishnoi P, (2021) Optimization of Sodium Lignosulfonate Treatment on Nylon Fabric Using Box–Behnken Response Surface Design for UV Protection, Autex Research Journal, https://doi.org/10.2478/aut-2021-0011 (Impact factor -0.957)	--(6.957)
8.	Ghosh R K, Majumder S, Bhattacharyya A, Paul A, Khan Z, Ray D P, Chattopadhyay S N, Pardeshi A, Shakyawar D B, Banerjee K (2021) Introducing a low-cost jute activated carbon as a novel cleanup agent in multiclass pesticide residue analysis using gas chromatography tandem mass spectrometry, Journal of Cleaner Production, 319, doi.org/10.1016/j.jclepro.2021.128696	I159 (17.10)
9.	Gogoi, M., Kadam, V., Jose, S., Shakyawar, D.B. and Kalita, B., (2020). Multifunctional Finishing of Woolens with Lemongrass Oil. Industrial Crops and Products, 177, 114489	J410 (9.50)
10.	Gupta N P, Shakyawar D B & Sinha R D (1998) Influence of fibre diameter and medullation percentage on woollen spun yarns and their products, Indian J of Fibre & Textile Research, 23 (1) 32-37	I066 (6.60)
11.	Gupta N P, Shakyawar D B & Sinha R D (1998) Influence of fibre diameter and medullation percentage on woollen spun yarns and their products Indian J of Fibre & Textile Research, 23 (1) 32-37	I066 (6.60)
12.	Gupta V, Jose S, Kadam V, Shakyawar DB (2021) Sol gel synthesis and application of silica and titania nano particles for the dyeing and UV protection of cotton fabric with madder, Journal of Natural Fibers, doi.org/10.1080/15440478.2021.1881688	J410 (9.50)
13.	Jose S, Thomas S, Jibin KP, Sisanth KS, Kadam V, Shakyawar DB (2022), Surface modification of wool fabric using sodium lignosulfonate and subsequent	I117 (11.90)

	improvement in the interfacial adhesion of natural rubber latex in the wool/rubber composites, Industrial Crops and Products 177, 114489	
14.	Jose Seiko, Roy R, Phukan A, Shakyawar D B, Sankaran A (2022), Biochar from Oil Cakes: An Efficient Adsorbent for the Removal of Acid Dyes From Wool Dye House Effluent, Clean Technologies and Environmental Policy, https://doi.org/10.1007/s10098-021-02253-2	C105 (10.30)
15.	Kadam V V, Meena L R, Singh S., Shakyawar D B and Naqvi S M K (2014) Utilization of coarse wool in agriculture for soil moisture conservation The Indian Journal of Small Ruminants, 20 (1): 87-90	T030 (5.11)
16.	Kadam V V, Shakyawar D B and Goud V (2013) Ultrasound scouring of wool and its effects on fibre quality, Indian J of Fibre & Textile Research, 38 (4) 410-414	I066 (6.60)
17.	Kadam V, Rani S, Jose S, Shakyawar DB (2021) Biomaterial based shrink resist treatment of wool fabric: A sustainable technology, Sustainable Materials and Technologies, 29, doi.org/10.1016/j.susmat.2021.e00298.	--(10.375)
18.	Kadam V, Rustagi Salu, Gupta Toolika, Shakyawar D B, Ajay Kumar & Shanmugam N (2021), Traditional Woolen Namda (Felted Fabrics) from Tonk, Rajasthan: A Livelihood Initiative for Rural Women, Textile: Cloth & Culture, 19 (3),1-15. doi.org/10.1080/14759756.2021.1993539 (NAAS-6.14) Impact Factor-0.14	--(6.14)
19.	Kumar A, Raja A S M, *Shakyawar D B*, Pareek P K and Krofa D (2015) Efficacy of natural dye from *Gerardiana diversifolia* on Pashmina (Cashmere) shawls Indian Journal of Fibre and Textile Research,40 (2) 2015, 180-183	I066 (6.60)
20.	Kumar A, Shakyawar D B, Kumar R, Meena AS, Meena NL and Chopra A (2021) Journal of Natural Fibers, Objective Evaluation of Luster (Gloss 60 degrees) of Different Indian Wools, Journal of Natural Fibres, doi.org/10.1080/15440478.2021.1994091	J410 (9.50)
21.	Kumar Ajay, Pareek P K, Kadam V V & Shakyawar D B (2016) Anti-moth efficacy of neem (Azadirachta indica A.Juss.) on woollen fabric, Indian Journal of Traditional Knowledge, 15 (2), 272-277	**I103 (6.80)**
22.	Kumar Ajay, Pareek P K, Kadam V V & Shakyawar D B (2016) Anti-moth efficacy of neem (Azadirachta indica A.Juss.) on woollen fabric Indian Journal of Traditional Knowledge, 15 (2), 272-277	I100 (6.76)
23.	Kumar Ajay, Shakyawar D.B., Raja A.S. M. and Narula H. K., (2013) Assessment of Magra and Bikaneri-Chokla wool for carpet manufacturing, The Indian Journal of Small Ruminant, 19 (2) 193-197	T030 (5.11)
24.	Kumar Nishant, Shakyawar D B, Chattopadhyay R, Kadam VV, Kumar Ajay (2020), Performance improvement of charkha spun crossbred wool yarn using siro spinning, The Indian Journal of Small Ruminants (The), 26 (2) 219-224.	T030 (5.11)
25.	Kumar Rajeev, Shakyawar D B, Pareek P K, Raja A S M, Prince LLL, Kumar Satish and Naqvi S M K (2015) Development of PCR based tequnique for detection of purity of Pashmina fibre from textile material, Applied Biochemistry and Biotechnology, 175(8), 3856-3862	A238 (8.93)
26.	Meena H C, Shakyawar D B* , Varshney R K & Kumar Ajay, (2020) Performance of Indian crossbred wool on khadi spinning system, Indian Journal of Fibre & Textile Research 45, pp 127-132.	I066 (6.60)

27.	Meena H C, Shakyawar D B*, and Varshney R K (2019) Tensile and Frictional Properties of Wool-Cotton Union Khadi Fabrics, Journal of Natural Fibers, https://doi.org/10.1080/15440478.2019.1568348	J410 (9.50)
28.	Meena H. C., Shakyawar D. B*., and Varshney R. K. (2020) Low-Stress Mechanical Properties of Wool-Cotton Blended Fabrics, Journal of Natural Fibers, DOI:10.1080/15440478.2020.1726252.	J410 (9.50)
29.	Meena HC, Shakyawar DB*, Varshney RK, Kadam V (2021) Thermo-physiological Clothing Comfort of Wool-Cotton Khadi Union Fabrics, Journal of Natural Fibers, doi.org/10.1080/15440478.2021.1958408	J410 (9.50)
30.	Meena HC, Shakyawar DB*, Varshney RK, Kumar A, (2021)Productivity, quality and comfort of Siro spun wool-cotton khadi fabrics, The Journal of The Textile Institute, doi.org/10.1080/00405000.2021.1910400	T046 (7.70)
31.	Mukesh Kumar Singh, Dinesh Babu Shakyawar, Parikshit Bajpai & Arun Kumar Singh Gangwar (2022): Pashmina Fiber Blended Woven Fabrics for High Functional Performances, Journal of Natural Fibers, https://doi.org/10.1080/15440478.2022.2139324	J410 (9.50)
32.	Nageshkumar T., Shrivastava, P., Saha, B., Subeesh, A., Shakywar, D.B., Sardar, G., & Mondal, J., 2023. Defects identification in raw jute fibre using convolutional network models. The Journal Of The Textile Institute, DOI:10.1080/00405000.2023.2199489	T046 (7.70)
33.	Nazir A Bumla, Sarfaraz A Wani S A, Sofi A S, Shakyawar D B, Yaqoob Ishrat and Seikh F D (2012) Comparative study on quality of pashmina shawls spun on traditional and innovative loom using hand and machine spun yarn, Indian J of Fibre and Textile Research, 37 (3) 224-230.	I066 (6.60)
34.	Patni P C, Shakyawar D B* &Gupta N P (2006) Studies on animal fibre blended hand made felts Part I Physical & mechanical properties, Indian J of Fibre & Textile Research, 31 (4) 553	I066 (6.60)
35.	Raja A S M, Shakyawar D B, Kumar A, Temani P and Pareek P K (2013) Feltability of coarse wool and its application as Technical felt Indian J of Fibre & Textile Research, 38 (4) 395-399	I066 (6.60)
36.	Raja A S M, *Shakyawar D B*&* Parthasarthy S (2008) Manufacturing of blanket (Kambali) by traditional methods using Coimbatore sheep wool at Kalanagal Village, Indian Journal of Traditional Knowledge, 7(1) 79-82.	I103 (6.80)
37.	Raja A. S. M., Shakyawar D. B., Pareek P. K., Temani P.&. Sofi A. H (2013) A Novel Chemical Finishing Process for Cashmere/PVA-Blended Yarn-Made Cashmere Fabric, Journal of Natural Fibers, 10:4, 381-389	J410 (9.50)
38.	Raja A.S.M., Shakyawar D.B., Kumar Ajay, Temani P. and Pareek P.K. (2014) Improvement in Quality and Moth Resistance of Traditional Namdha The Indian J of small Ruminants, 20(2) 83-86	T030 (5.11)
39.	Raja ASM, Ammayapan L, Shakyawar D B and Gupta NP (2011) Production and performance of Angora Rabbit hair-bharat merino wool blended shawl Indian Journal of Small Ruminants 2011, 17(1): 79-82	T030 (5.95)
40.	Raja ASM, Shakyawar D B , Pareek P K and Sarfaraz A. Wani, Production And Performance Of Pure Cashmere Shawl Fabric Using Machine Spun Yarn By Nylon Dissolution Process Indian Journal of Small Ruminants 2011, 17(2): 203-206	T030 (5.95)

41.	Rajput S K, MK Singh, DB Shakyawar (2023) Herbal Extract-Induced Silver Nanoparticles For Antibacterial Cotton Fabric, Fibres & Textiles in Eastern Europe, https://doi.org/10.2478/ftee-2023-0024	--(7.02)
42.	Rani S, Kadam V, Rose NM, Jose S, Shakyawar DB (2021) Effect of enzyme treatment on wool fabric properties and dimensional stability, Indian Journal of Fibre & Textile Research, 46 (1) 83-90.	I066 (6.60)
43.	Rani, S., Kadam, V., Rose, N. M., Jose, S., Yadav, S., & Shakyawar, D. B. (2020). Wheat starch, gum arabic and chitosan biopolymer treatment of wool fabric for improved shrink resistance finishing. International Journal of Biological Macromolecules.163, 1044-1052.	I192 (14.20)
44.	Ray DP, RK Ghosh, B Saha, A Sarkar, A Singha, Nilimesh Mridha, Ipsita Das, Gunasindhu Sardar, Jayanta Mondal, Manjunatha B.S, D.B.Shakyawar (2022) Accelerated retting technology for the extraction of golden fibre from the Indian Tossa jute (Corchorus sp.), Journal of Cleaner Production, 2022 https://doi.org/10.1016/j.jclepro.2022.135063	I159 (17.10)
45.	Samant, L, Jose Seiko, Rose Neelam M, Shakyawar DB, Antimicrobial and UV Protection Properties of Cotton Fabric Using Enzymatic Pretreatment and Dyeing with Acacia Catechu, Journal of Natural Fibers,1-11	J410 (9.50)
46.	Sarfaraz A Wani; Asif H Sofi; D B Shakyawar Ishrat Yaqoob, F A Mattu and A H Malik (2013) Fabrication of Innovative Charkha for Pashmina Spinning and its Impact Assessment The Journal of Textile Institute, 104:10, 1141-1144	T046 (7.77)
47.	Seiko Jose, R Roy, A Phukan, D B Shakyawar, A Sankaran (2021), Biochar from Oil Cakes: An Efficient Adsorbent for the Removal of Acid Dyes From Clean Technologies and Environmental Policy,Wool Dye House Effluent,	I066 (6.83)
48.	Seiko Jose, SabuThomas, P Jibin, KS Sisanth, Vinod Kadam, D B Shakyawar(2022), Surface modification of wool fabric using sodium lignosulfonate and subsequent improvement in the interfacial adhesion of natural rubber latex in the wool/rubber composites, Industrial Crops and Products 177, 114489	-- (9.662)
49.	Shakyawar D B*& Behera B K (2009) Influence of Softening Treatments on Hand Value of Woven Fabrics Produced from Indian Wool and their blends, Indian J of Fibre & Textile Research, 34 (1): 76-81.	I066 (6.60)
50.	Shakyawar D B*, Gupta N P, Patni P C& Arora R K (2008) Computer aided statistical tool for hand knotted carpets, Indian J of Fibre & Textile Research, 33 (4): 405-410	I066 (6.60)
51.	Shakyawar D B*, Gupta N Pand Patni P C (2006) Subjective Evaluation of Hand Knotted Carpets, Indian J of Fibre & Textile Research, 31(3) 426-431	I066 (6.60)
52.	Shakyawar D B*, Patni P C, & Gupta N P (2007) Studies on animal fibre blended hand made felts Part II Frictional, compressional & thermal properties, Indian J of Fibre & Textile Research, 32 (3) 301-305	I066 (6.60)
53.	Shakyawar D B, Gupta N P and Dagur R S (1999) Some Studies on Milk weed fibres, Indian J of Fibre & Textile Research, 24 (4) 264-268	I066 (6.60)
54.	Shakyawar D B, Kadam V V, Ajay Kumar, Mathuriya S R and Pramod Kumar (2017) Sensory evaluation of different pashmina shawls, Indian J of Fibre & Textile Research, 42 (3), 353-358	I066 (6.60)

55.	Shakyawar D B, Kadam V V, Ajay Kumar, Mathuriya S R and Pramod Kumar (2017) Sensory evaluation of different pashmina shawls, Indian J of Fibre & Textile Research, 42 (3), 353-358	I066 (6.60)
56.	Shakyawar D B, Kadam V V, Surya A S, Ahmed A, Pareek P K and Temani P (2013) Precise wool fibre diameter measurement using computerized projection microscope, The Indian Journal of small Ruminants, 19 (2) pp	T030 (5.11)
57.	Shakyawar D B, Patni P C, & Gupta N P (2007) Studies on animal fibre blended hand made felts Part II Frictional, compressional & thermal properties, Indian J of Fibre & Textile Research, 32 (3) 301-305	I066 (6.60)
58.	Shakyawar D B, Raja A S M, Gupta N P and Ammayappan L (2011) Development Magra-Nylon blended hand knotted Carpets, The Indian Journal of small Ruminants, 17(2) Oct., 2011, 207-209.	T030 (5.11)
59.	Shakyawar D B, Raja A S M, Kumar A, Wani S A and Parikh P K (2013) Pashmina (Cashmere) Fibre: Production, Charcteristics and utilization, Indian J of Fibre & Textile Research, 38(2) 207-214	I066 (6.60)
60.	Shakyawar D B, Raja A S M, Kumar Ajay, Pareek P K, (2015) Anti-moth Finishing Treatment for woollens using Tannin containing Natural Dyes, Indian Journal of Fibre and Textile Research,40 (2) 2015, 200-202	I066 (6.60)
61.	Shakyawar D B, Raja A S M. Wani S A, Kadam V V and Pareek P K. (2015) Low stress mechanical properties of pashmina shawls prepared from pure hand spun, machine spun and pashmina-wool blend yarn, The Journal of Textile Institute, 106(3) 327-337	T046 (7.70)
62.	Shakyawar D.B. *, Kadam Vinod, Surya A.K., Ahmed Aziz, Pareek P.K. and Temani Priyanka, Precise Measurement of Wool Fibre Diameter Using Computerized Projection Microscope Indian Journal of Small Ruminants 2013, 19(2): 190-192	T030 (5.11)
63.	Shakyawar D.B. *, N. Shanmugam, Ajay Kumar, V.V. Kadam and Seiko Jose (2018) Utilization of Indian Wool in Decentralized Sector: An Overview Indian Journal of Small Ruminants 2018, 24(2): 195-208	T030 (5.11)
64.	Shakyawar D.B.*, Kadam Vinod, Surya A.K., Ahmed Aziz, Pareek P.K. and Temani Priyanka, Precise Measurement of Wool Fibre Diameter Using Computerized Projection Microscope, Indian Journal of Small Ruminants 2013, 19(2): 190-192	T030 (5.11)
65.	Shambhu, V. B., Shrivastava, P., Jagadale, M., Nayak, L. K., & Shakyawar, D. B. 2023. Development of Gender-Friendly Power Ribboner for Extraction of Green Ribbon/Bast from Jute Plants. Journal of Natural Fibers, 20(2), 2250076.	J410 (9.50)
66.	Shanmugam N, Shakyawar DB, Ajay Kumar, Vinod Kadam, Seiko Jose, Development of wool-cotton blended blanket and assessment of its quality, The Indian Journal of Small Ruminants (The), 27(2) 264-270.	T030 (5.11)
67.	Shanmugam N, Shakyawar DB, Kumar A, Kadam VV, Jose Seiko (2020) Water absorption and dynamic load bearing properties of coarse wool braided rope mat, The Indian Journal of Small Ruminants, 26 (1) 225-229,	T030 (5.11)
68.	Shanmugam, N., Shakyawar, D. B., Jose, S., Kumar, A., & Kadam, V. (2020). Blending of comber noil and raw wool and its effect on blanket properties. The Indian Journal of Small Ruminants, 26(1), 112-116.	T030 (5.11)

69.	Singha A, A Das, BS Manjunatha, M Bhowmick, Deb Prasad Ray*, A.K. Thakur, Biplab Saha, Ruby Das, Robin Das, Amit Das and D.B. Shakyawar (2022) Softening of Barky Root Cuttings of Jute by Pectinolytic Bacterial Strains for Better Spinnability and Industrial Uses, Economic Affairs, 439-444. DOI:10.46852/0424-2513.4.2022.8.	
70.	Sofi AH, SA Wani, S Jose, A Kamboj, DB Shakyawar, S Nachimuthu (2023) A Comparative Study on the Dyeing Efficiency of Pashmina and Pashmina Blended Knitwear with Acid Dyes, Journal of Natural Fibers, https://doi.org/10.1080/15440478.2022.2131690	J410 (9.50)
71.	Wani Sarfaraz A; Asif H Sofi; D B Shakyawar Ishrat Yaqoob, F A Mattu and A H Malik (2013) Fabrication of Innovative Charkha for Pashmina Spinning and its Impact Assessment, The Journal of Textile Institute, 104:10, 1141-1144	T046 (7.70)

16. Training program attended (Numbers only) : 10

17. Training program organized (Numbers only): 5

Winter school/summer school/ other training		
Winter school - Processing & Product Development of Wool & Speciality fibres and their Evaluation	ICAR	09/09/2003-29/09/2003
Winter school : Innovation in wool production and technologies for value addition	ICAR	04/12/ 2008 to 24/12/2008
ii. Organised Customised Training / externally funded outreach program		
ICAR Short course on "Quality Evaluation and Value addition to sheep produce: Wool and Mutton	ICAR	16/09/2019 to 25/09/2019
Customized Training on "Hand on training on Natural Dyeing" for faculty and research scholars	Self financed	March 22, 2018 to March 28, 2018
Basic Research Tools for Textile Testing and Textile Chemistry	Self Financed	July 31,-Aug. 24, 2018

18. Professional Affiliations (Details)
    a. Life Member, ISSGPU, Avikanagar, Ex-Secretary, ISSGPU (2013-14)
    b. Life member, Indian Society of Agricultural Engineers, New Delhi (LM-12708)
    c. Life Member, TINFS, Kolkatta & President, TINFS
    d. Life member, IE(India) and Chairman, WBSC-TED, Kolkata
    e. Chairman, Sub-committee (TXD-04)-Wool & Woolen Products, BIS New Delhi
    f. Member, Board of Governor, Bundelkhand Institute of Engineering & Technology, Jhansi (July 10, 2017-July 9,2020)
    g. Member, Board of Governor, Rajkiya Engineering College, Kannauj, Rajkiya Engineering College, Mainpuri; Rajkiya Engineering College, Sonbhadra; Rajkiya Engineering College, Bijnor (UP) year (2017- 2020)

19. PhD/M Tech student supervised : 16

Name of Student	Degree Program	Year of Completion	Major Guide or Co-Guide

Meena HC, Studies on Indian Crossbred Wool And Its Blend on Khadi Systems	PhD, PTU Bhatinda	2020	Co-guide
Khan Ashma, Development of Apparel Through Blended Wool Fabrics	PhD, IIS University, Jaipur	2019	Co-guide
Chagan Lal, Chemical Investigation of natural dyes and their application on Pashmina wool and its blends	PhD from University of Rajasthan	2015	Co-guide
Manjali Sharma, "Performance of cotton wool blended knitted khadi fabrics and consumer utility of the same"	PhD from Bansthali Vidya peeth, Bansthali	2016	Co-guide
S K Rajpoot, "A study on antimicrobial finishing of cotton textiles from natural sources"	PhD from AK TU, Lucknow	Cont.	Co-guide
Puja Viswakarma, Studies on Natural fibres based composites using different (2D, 2.5D and 3D) textile structure	PhD from AK TU, Lucknow	Cont.	Co-guide
Yogita, "Studies on application of natural dyes using nano particles"	PhD MPUAT, Udaipur	Cont.	Co-guide
Neeraj Malick "Studies on flax fibre reinforced flexible composites through process optimization"	PhD from Maharaja Ranjit Singh Punjab Technical University Bathinda- Punjab	Cont.	Co-guide
Mathurya Sukhram, 'Studies on Pashmina and Blended Shawls Using Polyvinyl Alcohol (PVA) as carrier Fibre'	M Tech from UPTTI Kanpur, Dr APJ AKTU Lucknow	2011	Co-guide
Nishant "A study to explore the possibilities of replacing australian merino wool by indian wool in khadi fabric" (Awarded)	M Tech from IIT Delhi	2011	Co-guide
Arvind Yadav, a study on comfort properties of kevlar and kevlar based union fabrics	M Tech from UPTTI Kanpur, Dr APJ AKTU Lucknow	2017	Co-guide
Mayank Gupta, Some Studies on Natural Dyes By Using Mordants And Nanoparticles	M Tech from UPTTI Kanpur, Dr APJ AKTU Lucknow	2018	Co-guide
Durgesh Raj Maurya, Eco-Friendly Dyeing of Wool Cotton Blended Yarn By Reactive Dye	M Tech from UPTTI Kanpur, Dr APJ AKTU Lucknow	2018	Co-guide
Amit Jha, Study on performance properties of hand loom carpet	M Tech from UPTTI Kanpur, Dr APJ AKTU Lucknow	2018	Co-guide

20. Awards/recognition

	Awards/Honors	Details of Award/Honor	Year	Awarding organization
1	Secretary	Secretary of ISSGPU for the year 2012-14	2012	Indian Society of Sheep and Goat Production and Utilisation
2	Fellowship	Fellow of Institution of Engineers (India)	2016	Institution of Engineers (India) Kolkata

3	Fellowship	Recognition as Fellow	2019	Indian Society of Sheep and Goat Production & Utilization
4	President	TINFS President of the society	2020-cont.	The Indian Natural Fibre Society
5	President	IE of West Bengal State appointed Chairman of WBSC for 2021-22 & 2022-23	2021	IE (I) West Bengal State