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Textile Research Conference

TRC 2025

01 Nov 2025, Dhaka, Bangladesh

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6th Textile Research Conference

in collaboration with

SOUTHEAST UNIVERSITY

Meeting the Challenges of Time

in association with

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Textile Research Conference 2025 - Programme	
	01 November 2025 | Multipurpose Hall (9th Floor), Southeast University, 252, Tejgaon I/A, Dhaka
09:00	Registration
10:00	**Plenary Session -** "Bangladesh Textile Sector after 25 Years: The Role of Research & Innovation"
10:00	**Welcome –** *by Professor Engr. Mashud Ahmed, Chairman Dept. of Textile Engineering, Southeast University & Ex VC BUTEX*
10:10	**Opening Address –** *by Dr. Abu Sadat M. Sayem, Founder CRISAT*
10:20	***Special Guest -*** *Prof. Dr. Ayub Nabi Khan, Vice Chancellor (Acting), BGMEA University of Fashion & Technology (BUFT)*
10:30	***Special Guest*** *- Engr. Ehsanul Karim Kaiser. Convenor, Interim Committee, The Institution of Textile Engineers & Technologists (ITET), Bangladesh*
10:40	***Chief Guest*** *- Professor Dr. Md. Zulhash Uddin, Vice Chancellor, Bangladesh University of Textiles*
10:50	***Co-Chair*** *- Professor M. Mofazzal Hossain, PhD, Pro Vice Chancellor, Southeast University*
11:00	***Chair*** *- Professor Yusuf Mahbubul Islam, PhD, Vice Chancellor, Southeast University*
11:10	**Break**
	Technical Session 1 – "Textile Innovation, Research and Education"
11:20	**Effect of Stacking Sequence on the Rheological criteria for three different natural fibre composites,** *Dr. Sweety Shahinur, Textile Physics Division, Bangladesh Jute Research Institute*
11:40	**An Investigation into the Fabric Touch Testing and Microfibre Shedding Tendency of Commercial Fleece Fabrics.** *Abdullah Sayam, Bangladesh University of Textiles*
12:00	**(Keynote) Advancing Textile Research and Development in Bangladesh: Current Trends, Challenges, and Future Prospects,** *Dr. Md. Fazley Elahi, Head of Research & Development, DBL Group*
12:20	**Process Innovation: Rethinking the Tradition** *XavierJonch, Aplication y Suministros Textiles, S. A. U, Spain*
12:40	**(Keynote) Quality Education and Accreditation** *Professor Dr. Mohammad Forhad Hossain, Bangladesh University of Textiles*
13:00	*Chair - Professor ANM Ahmed Ullah, PhD, Southeast University*
13:10	**Break - Prayer and Lunch**
	Technical Session 2 & Prize Giving Ceremony
14:30	**CRISAT - ASUTEX Research Competitions for Textile & Fashion Students, 2025** *Presentations by the Finalists*
15:10	**(Keynote) Textile Future Outlook: How Young Innovators will Shape the Next Industrial Revolution in Bangladesh, *Special Guest* –** *Engr. Mahbubul Alam Milton, Executive Director, Masco Group*
15:30	**Slow Fashion in Bangladesh: A Study on Young Adult Consumers' Purchase Intention** *Urmila Mukhtar Jeny, BUFT & Dr. Ghada Soliman, University of Manchester*
15:50	**(Virtual Talk) Yarn-to-Apparel: 3D Weaving Innovation for Waste-free Apparel Production** *Dr Yuyuan Shi, Northumbria University*
16:10	**Digital Catwalk** *by CRISAT Digital Fashion Research Group*
16:10	***Special Guest -*** *Md. Anis-Ur Rahman, Country Manager, ASUTEX*
16:20	**Guest of Honour** *– Dr. Kamruzzaman Kayser, Director, Micro Fiber Group*
16:30	**Prize-Giving Ceremony - CRISAT - ASUTEX Research Competitions for Textile & Fashion Students**
16:50	**Group Photo & Vote of Thanks**

Advisory Panel

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Chairman Dept. of Textile Engineering, Southeast University & Ex VC BUTEX

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Engr. Ehsanul Karim Kaiser Convener, Institution of Textile Engineers & Technologists (ITET), Bangladesh	Prof. Dr. Muhammed Mahbubur Razzaque Bangladesh University of Engineering & Technology (BUET)
Prof. Dr. Md. Abu Bin Hasan Susan Dept. of Chemistry and Director of Dhaka University Nanotechnology Centre (DUNC) Dhaka University	Engr. Md. Moslem Uddin Director (Technical), Bangladesh Jute Research Institute (BJRI)

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Effect of Stacking Sequence on the Rheological Criteria for three different Natural Fibre Composites

Sweety Shahinur[1], Mahbub Hasan[2], Sharmin Akter[1], Mike Downs[3], Ryan Street[3], M M A Sayeed[1], Julfikar Haider[4]

[1]*Textile Physics Division, Bangladesh Jute Research Institute, Manik Mia Avenue, Dhaka-1207*

[2]*Department of Material and Metallurgical Engineering, Bangladesh University of Engineering and Technology, Dhaka-1000*

[3]*Faculty of Science & Engineering, Manchester Metropolitan University, Chester Street, M1 5GD*

[4]*Department of Engineering, Manchester Metropolitan University, Chester Street, Manchester, M1 5GD*

Abstract

Understanding how polymer composites respond under heat and mechanical stress is crucial for enhancing fire safety in structural and functional applications. This study explores the rheological behavior of natural fibre-reinforced polypropylene (PP) composites - specifically using jute, kenaf, and pineapple leaf fibre (PALF) - fabricated in layered stacking sequences. The primary objective is to investigate how different fibre arrangements influence the viscoelastic properties of the resulting composites under dynamic thermal conditions. Dynamic Mechanical Analysis (DMA), conducted via the dual cantilever method at a constant frequency of 1 Hz over a temperature range of 35°C to 90°C, was employed to assess storage modulus, loss modulus, and damping behavior. The results revealed that fibre reinforcement significantly improved the stiffness and thermal stability of PP, with distinct performance trends observed depending on the stacking sequence of the fibres. However, non-uniform fibre dispersion in certain sequences contributed to reductions in mechanical consistency. Surface morphology analysis via Scanning Electron Microscopy (SEM) supported these findings, confirming interfacial bonding irregularities in some samples. This study not only provides insight into optimizing fibre alignment and stacking for mechanical reliability but also highlights potential applications in smart fire-resistant materials. By identifying early deformation or viscoelastic failure signatures, these composites may be adapted for integration into early fire-warning systems or thermally sensitive environments. The findings contribute valuable data for the development of eco-friendly, safety-oriented materials in sectors such as construction, transportation, and defense.

Keyword: Storage modulus, Loss modulus, Cole-Cole, Stiffness, Layer composite, Dynamic Mechanical Analysis (DMA), Visco-elasticity

Eco-friendly Desizing using Enzymatic Extracts from Agro-waste

Abdullah Al Mamun Sarkar

Bangladesh University of Textiles

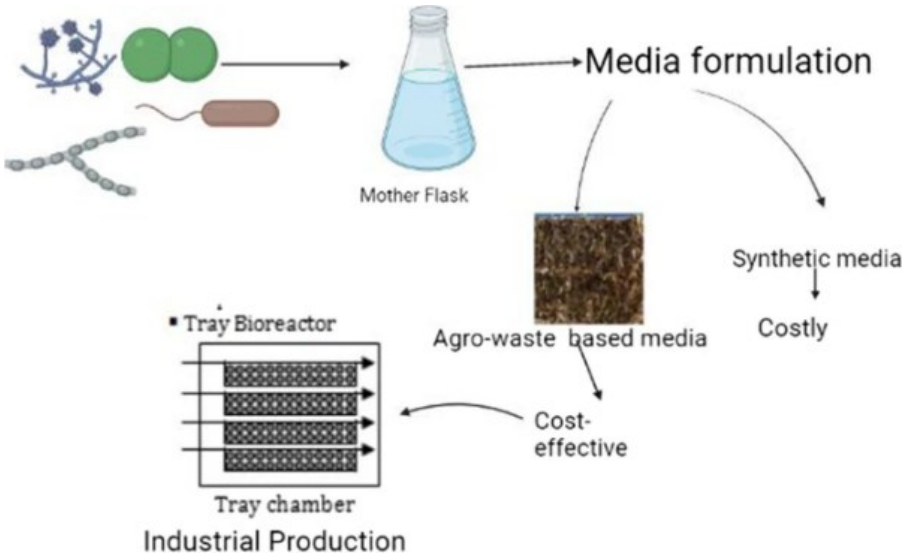
Highlights

- Agro-waste-based desizing is eco-friendly, sustainable & cost-effective
- It utilizes amylase and protease enzymes from agro-waste like rice husk, papaya peel, etc.
- It reduces the use of harsh chemicals.

Abstract

In textile processing, desizing is a significant process that removes the sizing materials applied on warp yarns made of cotton and its blends before weaving. The desizing process with industrial enzymes is mostly costly. At the same time, the chemical desizing process is not environmentally friendly. Agro-waste can be a great source of amylase and protease enzymes required for the desizing process. It is a way to utilize waste materials to produce a desizing enzyme that will ensure sustainability and environmental safety. This article aims to outline and analyze the potential of agro-waste for an eco-friendly and cost-effective desizing process using amylase and protease enzymes.

Graphical abstract



Keywords: Eco-friendly, sustainable, desizing, agro-waste, enzyme.

Green Alternatives to Chemicals in Textiles: An Enzymatic Approach

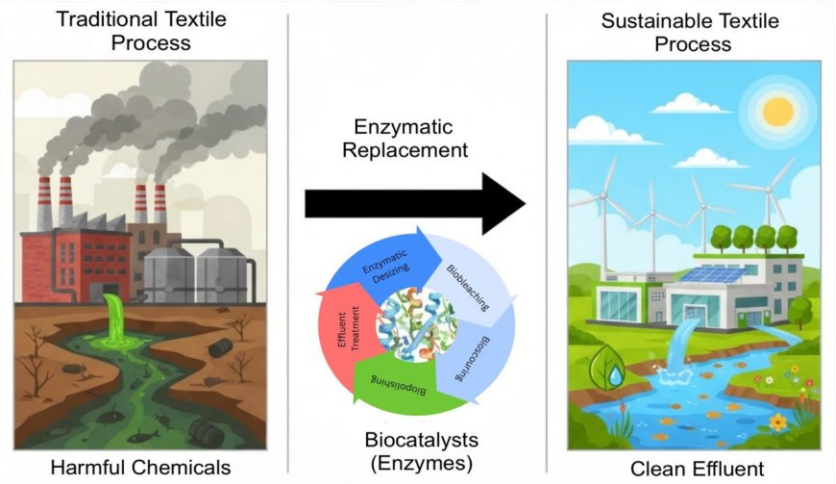
Junaidul Islam Radif

Bangladesh University of Textiles, Dhaka

Highlights

- Provides critical discussion about the real applicability of enzymatic processes.
- Enzymes have been widely regarded as a green alternative.
- Has wide range of applications in textiles.
- Can address the problem of the harmful sides of chemicals and effluents.

Graphical Abstract



Keywords: Enzyme, Biotechnology, Textile bio-processing, Sustainability, Microorganisms

Table 1: *Enzyme alternatives of existing chemicals*

Textile process	**Conventionally used Chemicals**	**Sustainable Alternative (Enzyme)**	**Reference**
Desizing	Sulfuric acid or Hydrochloric acid	Amylase	(Aneela Rehman, 2023)
Bleaching	Hydrogen peroxide, Calcium and sodium hypochlorite	Glucose-oxidase, laccase, ligninase	(Sarkar S., 2020)
Scouring	Sodium hydroxide	Pectinase	(Colombi, et al., 2021)
Washing and Polishing	Nonylphenol–ethylene oxide	Cellulase	(Islam, et al., 2024)
Effluent treatment	Alum and iron salts, Hydroxyl radicals	Proteases, lipases, laccase	(Teshale Adane, 2021), (Aragaw, et al., 2024)

Digital Sampling in Bangladesh's Apparel Industry: A Sustainable Shift

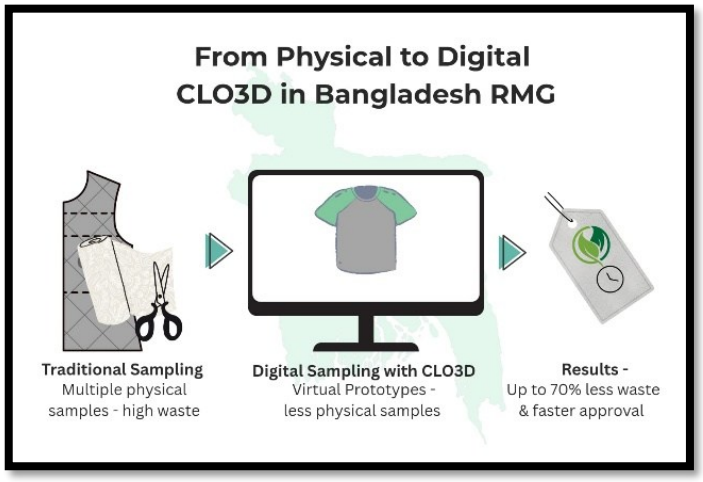
Mahanaz Sultana Meem

Atish Dipankar University of Science and Technology

Highlights

- The RMG sectors of Bangladesh produces a lot of fabric waste during sampling.
- 3D CAD can reduce sample -stage waste by 30-70%.
- Combining digital and physical sampling is a realistic approach.
- Training hubs in universities and BGMEA centres can support wider use.

Graphical Abstract



Abstract

The ready-made garment (RMG) industry of Bangladesh is central to the country's economy, but it also creates significant waste during sample-making. Traditional sampling uses fabric, labour, and energy, and many of these trail garments end up discarded. This short article reviews how digital sampling with 3D CAD can offer a sustainable alternative. Based on literature and reports, 3D CAD is shown to reduce waste by 30-70%, save time, and lower costs. It also provides benefits for education by preparing students with digital design skills. However, challenges such as high software costs, limited training, and buyers still demanding physical samples slow down adoption. A combined approach – using digital samples first and fewer final physical samples – appears practical for Bangladesh. If supported through training centres in universities and BGMEA facilities, 3D CAD can help the RMG sector remain competitive while moving toward sustainability.

Keywords: 3DCAD, Digital Sampling, Sustainable Fashion, RMG Industry, Bangladesh

A Study on the Impact of Fast Fashion in Bangladesh

Mahiya Rahman

BGMEA University of Fashion & Technology

Highlights

- Young people are directing the fast fashion craze
- Sustainability is still on second priority
- The industry brings money, but at a cost
- Middle income shoppers hold the key
- Workplace & industry perspective

Abstract

This paper shows the impact of fast fashion in Bangladesh, mainly focusing on its environmental consequences, economic significance and alignment with Sustainable Development Goals (SDGs). While over 80% of Bangladesh's export earning is coming from ready-made garments (RMG), this industry is also providing millions of jobs, but it is also generating severe ecological damage, labor rights concerns and social inequalities. Using a mixed method of literature review and a primary Google Form survey of my own where respondents- including, university students, garment worker and fashion employees - the study finds that young people are key drivers of fast fashion consumption, but they hesitate to adopt sustainable alternatives due to high costs and low availability. The findings highlight the inconsistency between economic gain, environmental and social costs highlighting the urgent need for affordable eco-friendly options, corporate responsibility and strong regulation. This research helps in combining consumer - level data with industry analysis, offering recommendations for balancing profitability with sustainability in Bangladesh's fashion sector.

Graphic Abstract

Keywords: Eco friendly materials, Industry 4.0, Worker safety, Sustainability, Environmental Impact.

Industrial Microbiology for Sustainable Dyeing in Bangladesh

Md. Zonaid Khan Abir

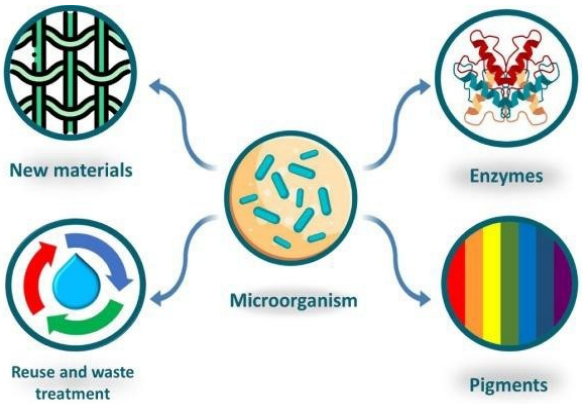
Bangladesh University of Business and Technology

Highlights

- Microbial pigments are sustainable alternatives to synthetic dyes in the textile industry.
- Enzyme-assisted microbial processes reduce the need for harmful chemical auxiliaries.
- Microbial colourants enable efficient dyeing with lower water and energy consumption.
- Microbial dyeing processes contribute to reducing industrial wastewater toxicity and improving eco-friendly production.
- Adoption of microorganisms supports sustainability goals related to water management, responsible production.

Introduction

Microorganisms are now being used in various types of industries around the world. Various industries are now playing a role in achieving the United Nations Sustainable Development Goals by using them. In short terms, it is called industrial microbiology. A microorganism is a tiny living thing that cannot be seen with normal eyes and that primarily helps to make food, clean waste, or produce medicine. Microorganisms can also be used in the textile industry during the dyeing process. However, Bangladesh's textile industries lag behind in this regard. The use of microorganisms in dyeing processes here is almost non-existent. This paper reviews the use of microorganisms in the textile industry and their advantages, along with application procedures. Shows insights of microbial colourants, pigments and enzymes and their production. Then it summarizes the documented availability of suitable microorganisms in Bangladesh. Finally, the paper aims to show how adopting microorganisms in the textile industry can contribute to achieving key Sustainable Development Goals, specifically SDGs 6 and 12.



Sustainable Textile Colouration Using Nanobubble Technology

Mehbuba Manir Nova

Bangladesh University of Textiles

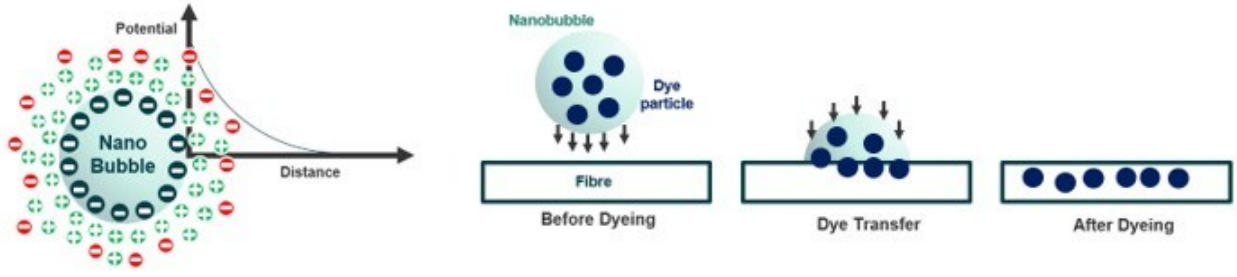
Highlights

- Nanobubbles are characterized by high zeta potential, high mass transfer efficiency and large specific surface area.
- Nanobubbles-assisted dyeing can be done at an ultra-low liquor ratio of 1:1.

Abstract:

The textile industry is a major contributor to global water pollution, with conventional dyeing processes consuming large volumes of water, dyes, and chemicals while generating significant wastewater. Nanobubble (NB) technology has emerged as a promising, water-efficient alternative for textile colouration. NBs are stable gas bubbles less than 1 μm in diameter, characterised by high surface area, elevated internal pressure, and slow rising velocity, which enable enhanced gas dissolution and efficient mass transfer. Experimental studies have shown that NB dyeing can achieve comparable colour strength, wash fastness, and rubbing fastness to conventional processes, with substantial savings in water, energy, and chemical usage. However, reduced shade depth has been observed in some cases due to limited dye migration, indicating a need for process optimisation to enhance colour strength while maintaining low resource consumption. This review discusses the fundamental properties, mechanisms, and applications of NBs in textile dyeing, highlighting their potential as a sustainable alternative to conventional dyeing methods and identifying future research directions for industrial-scale adoption.

Graphical Abstract



Keywords: Nanobubble dyeing, Water-efficient dyeing, Sustainable dyeing technology.

Bio-Scouring Using Enzymes in Cotton and Banana Fibres for Sustainable Textiles

Ria Islam Shimu

BGMEA University of Fashion & Technology (BUFT)

Highlights

- Instead of using harsh chemicals, we can use enzymes in the scouring process, making textile production more eco-friendly.
- The research highlights how specific enzymes effectively remove impurities (dust, dirt, oil, waxes), improving fibre quality without damaging their natural properties.
- Bio-scouring process can reduce water consumption and energy requirements compared to conventional methods.
- In the enzymatic process, fibres become more hydrophilic, which enables enzymatic scouring to develop water absorbance and maintain fibre integrity more effectively.

Graphical Abstract

Keywords: bio-scouring, eco-friendly, cost-effective, enzymatic treatment.

Environmental Sustainability in Yarn Manufacturing: Recycling, Energy Consumptions, Waste Management & Technological Development

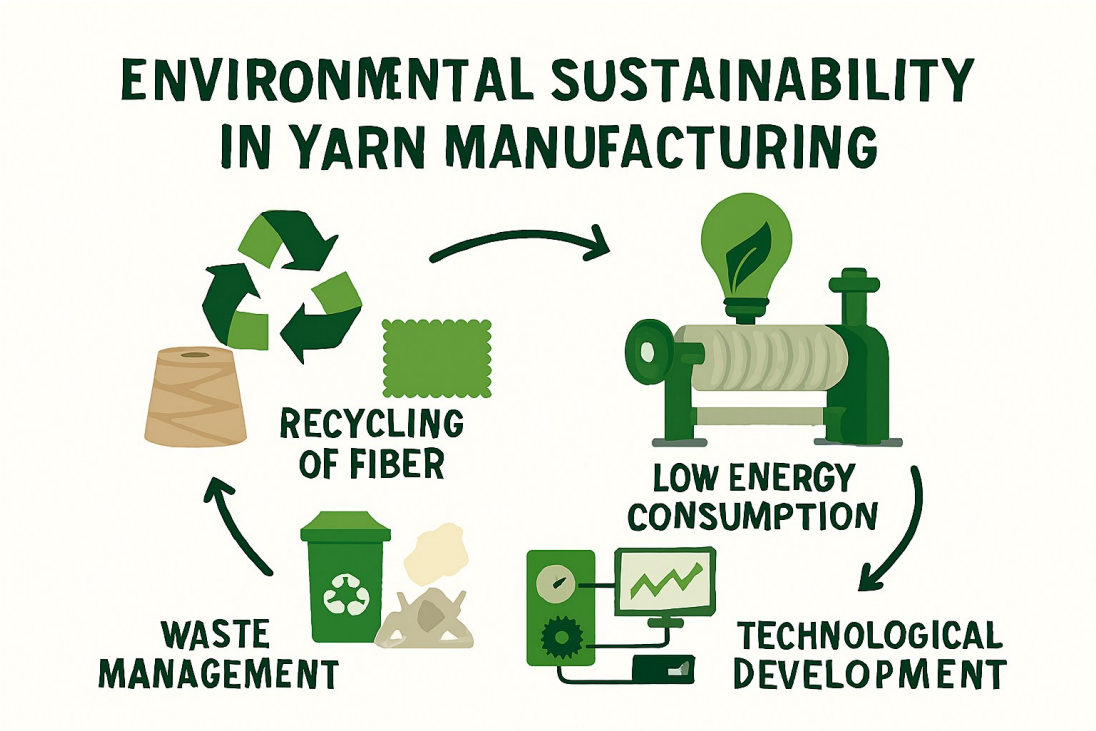
Ridwan Tanvir

Bangladesh University of Textiles (BUTEX)

Highlights

- Recycled fibres (10–60%) can be effectively used in yarn manufacturing
- Elastic core spun yarn from recycled fibre to make stretched denim
- Ring spinning is energy-intensive
- Mechanical recycling is energy-efficient but has quality trade-offs
- Waste reduction by recycling pre-and post-consumed textiles and goods
- Biofuel from waste cotton by pyrolysis and used in the energy segment
- Glucose extraction from waste and making fuel to create energy

Graphical Abstract



Keywords: Energy consumption, yarn spinning, waste valorization, technological development, recycles of fibre.

Pollution and Dye Wastewater Treatment in Bangladesh Textile Sector

Sadia Karim
Ahsanullah University of Science and Technology

Highlights

- Overview of treatment of dye wastewater in textile sector of Bangladesh.
- Identification of possible challenges.
- Integration of technology, policy and training for improved performance in treatment.
- Opting circular economy and water reuse in textile production.

Abstract

The textile industry of Bangladesh, one of the world's major contributors to the economy, releases massive amount of dyed wastewater; thereby posing a serious threat to the environment as well as public health. Despite a large number of factories already having set-up Effluent Treatment Plants (ETPs), they do not operate at efficiency owing to the high costs, poor maintenance and the lesser use of advanced technologies. This essay aims to provide a comprehensive assessment of dye wastewater treatment practices in Bangladesh's textile sector, emphasizing current challenges, emerging sustainable solutions and demonstrate their strengths as well as limitations. Novel and environmentally friendly techniques are being deployed, such as using low-cost adsorbents extracted from agricultural by-products, microbial decolourization and enzyme applications coupled with advanced oxidation processes to remove broad range of dyes for better treatment efficiency with minimum waste generation. If Bangladesh now ties these threads together like regulatory enforcement, industry capacity building and access to frontier technologies, the country can move towards a cleaner, circular textile economy.

Keywords: Textile Effluent, ETP, Wastewater Treatment, Sustainability, Dye Wastewater

Technological Innovations in Transforming Lemon Byproducts for Sustainability

Syed Yaseen Abdullah
BGMEA University of Fashion & Technology (BUFT)

Highlights

- Transforming lemon by-products into value-added products reduces waste and promotes circular economy practices.
- Innovative fibre extraction methods enable the creation of sustainable bioplastics and textiles from citrus waste.
- Lemon-derived materials demonstrate high biodegradability and reduced CO_2 emissions compared to petroleum-based plastics.
- Integration of citrus fibres into fabrics offers both functional and aesthetic benefits for eco-conscious consumers.
- Challenges remain in supply chain consistency and consumer awareness, but market opportunities are expanding rapidly.

Keywords: Lemon by-products, citrus waste, sustainable materials, bioplastics, regenerated fibres, eco-friendly textiles, circular economy,