Sustainable Textile and Fashion Congress (STFC)

30 July 2021 | Online Event

Programme

Session 1 - 8:40-10:00 GMT / 9:40-11:00 BST	
Starts - Germany 10:40 / NC State & Toronto 05:40 / Bangladesh 14:40 / China 16:40	
Chair - Dr. Abu Sadat Muhammad Sayem, Manchester Metropolitan University, UK	
P1	**Keynote - *Textile Sustainability: The Way Forward***, Dr. Muhammad Mohsin, Chairman, Department of Textile Engineering; Leader, Textile sustainability Research Group; University of Engineering and Technology Lahore, Faisalabad
P2	***Contemporary Issues in Fashion Sustainability: A Systematic Review of Literature from January 2010 to July 2020***, Mrs Anubhav Malik, Manchester Fashion Institute, Manchester Metropolitan University
P3	***Analysing Consumer Behavior Regarding Sustainable Fashion Using Theory of Planned Behavior,*** *Mr. Rayed Barkat,* BGMEA University of Fashion and Technology, Bangladesh
P4	***Present Scenario in New Product Development (NDP) in Fashion and Recommendations for Incorporating Sustainability***, Ms Bristi Sarker, Bangladesh University of Textiles

Session 2 - 10:00-11:00 GMT / 11:00-12:00 BST	
Starts - Germany 12:00 / NC State & Toronto 7:00 / Bangladesh 16:00 / China 18:00	
Chair – Dr. Rishad Rayyan, King's College London, UK	
P1	***Sustainable Fashion and Textiles Frameworks***, Ms Anna Romachney, Microbiology and Molecular Biology, Manchester Metropolitan University
P2	***Reusing textile desiccant bags in container shipping of textile goods***, Mr. Marcel Beiß, Center of Textile Logistics (CTL) at the Fraunhofer Institute for Material Flow and Logistics (IML) and the Hochschule Niederrhein, Germany
P3	***Rethinking Textile Fibres and Yarn Production Practices from Sustainability Point of View***, Mr. Tanvir Mahady Dip, Bangladesh University of Textiles
P4	***Sustainable Fashion and Textile Production: A ManMet GCRF Project***, Dr. Abu Sadat Muhammad Sayem, Manchester Fashion Institute, Manchester Metropolitan University

Programme

Session 3 - 13:00-14:00 GMT / 14:00-15:00 BST	
Starts - Germany 15:00 / NC State & Toronto 10:00/ Bangladesh 19:00 / China 21:00	
Chair - Dr. Abu Sadat Muhammad Sayem, Manchester Metropolitan University, UK	
P1	***Success factors for last mile service providers based on the example of fashion e Commerce deliveries***, Ms Natalie van Bentum, Center of Textile Logistics (CTL) at the Fraunhofer Institute for Material Flow and Logistics (IML) and the Hochschule Niederrhein, Germany
P2	***An Overview on present scenario and recommendations towards sustainability issues in fabric manufacturing,*** Ms Humayra Akhter Himu, Bangladesh University of Textiles
P3	***Environmental Sustainability Evaluation of Knit Manufacturing Factory in Bangladesh: A Case Study***, Mr. Md. Mazedul Islam, The University of Manchester, UK

Session 4 - 14:00-15:00 GMT / 15:00-16:00 BST	
Starts - Germany 16:00 / NC State & Toronto 11:00/ Bangladesh 20:00 / China 22:00	
P1	***"Conversation with Professor Bastian Quattelbaum on Sustainability and Fashion",*** Moderator **-** Dr. Abu Sadat Muhammad Sayem.
Chair - Prof. Dr. Bastian Quattelbaum, University of Applied Sciences, Niederrhein	
P2	***Immobilizing catalysts on textiles for sustainable development,*** Dr. Mohammad Neaz Morshed The Swedish School of Textiles, University of Borås, Sweden
P3	***A Systematic review on Sustainability in Fashion Supply Chain (FSC) from emerging economy perspective***, Mr. Mohammad Iftekhar Rahman, BGMEA University of Fashion and Technology, Bangladesh

Abstracts

[Keynote]

Textile Sustainability: The Way Forward

Muhammad Mohsin

Department of Textile Engineering, University of Engineering and Technology Lahore, Faisalabad Campus, Pakistan

Textile is one of the basic human need but unfortunately textile and fashion industry is the 3rd biggest pollutant industry of the world. Considering the global increase in the demand of textile due to fast fashion and increase in human population, situation of textile industry will become more alarming. There can be number of steps through which textile sustainability can be achieved and efficient use of water for textile processing can be one of them. Efficient use of water leads to multiple benefits like saving of good quality fresh water, energy saving, significant saving of dyes, chemicals and auxiliaries, less load on the effluent treatment plant and less wastewater discharge into environment. Significant amount of water can be saved by using water efficient machines, which use low liquor ratios. Similarly, nano bubble machines use extremely low liquor ratio of 1:1 leading to significant saving of water, chemical and energy. Foam coating is another option for water efficient processes, which is more relevant to continuous textile processing. Foam coating can lead to 38% overall saving of water, chemical and energy.

Contemporary Issues in Fashion Sustainability: A Systematic Review of Literature from January 2010 to July 2020

Anubhav Malik[1], Abu Sadat Muhammad Sayem[1] and Julfikar Haider[2]

[1]Manchester Fashion Institute, Manchester Metropolitan University, M15 6BG, UK
[2]Department of Engineering, Manchester Metropolitan University, M1 5GD, UK

This systematic review employed a content analyse of the contemporary research woks in the area of fashion sustainability published between January 2010 and July 2020. The databases such as ScienceDirect, Web of Science, Textile Technology Index, Sage, and Scopus were considered. The findings of this review are grouped under the following themes: assessing global impact of fashion waste, evaluating the impacts of sustainable materials in circular fashion, progress in life cycle analysis of fashion products, and analysing marketing strategies for communicating sustainability. It is anticipated that the stakeholders both in industry and academia who are involved in innovative fibre development and processing, textile supply chain, textile manufacturing, end of life management and sustainable policy developers will be benefited from the findings of this review.

Keywords: Sustainable fashion; Waste, Sustainable materials, Marketing sustainability

Analysing Consumer Behavior Regarding Sustainable Fashion Using Theory of Planned Behaviour

Rayed Barkat[1], Abu Sadat Muhammad Sayem[2], Julfikar Haider[2] and Ayub Nabi Khan[1]

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[2]Manchester Metropolitan University, UK

Zero-waste pattern cutting (ZWPC) can be described as a method, a notion or a philosophy of design that intends to use the entire area of fabric available within a particular length for constructing garments creating absolutely zero waste. As governments and organisations are opting towards legislations focusing on the climate emergency and consumer mindset changing to focus this climate emergency we are facing now, prevailing waste-generating processes are coming to an end or at least going to be replaced by more environment friendly practices that produces zero or close to zero waste. Although the aspects of zero waste fashion regarding pattern cutting techniques, selection of material and manufacturing process were discussed by the researchers, works that investigate the attitude of the consumers towards zero waste fashion are quite limited in number. In this study, the consumers' intention toward zero waste fashion was examined through the theory of planned behaviour (TPB). The TPB model was employed in fundamental form as well as expanded form containing the behavioral beliefs, normative beliefs and control beliefs influencing the determining factor of the intention construct. Subsequent carrying out of an online survey among 350 participants in the United Kingdom and Bangladesh, confirmatory factor analysis and structural equation modelling will be utilised to analyse the models and present the results.

Keywords: Zero Waste Fashion, Theory of Planned Behavior, Sustainability, Consumer Behavior

Present Scenario in New Product Development (NDP) in Fashion and Recommendations for Incorporating Sustainability

Bristi Sarker[1], Abu Sadat Muhammad Sayem[2], Julfikar Haider[2] and Abbas Uddin Shiyak[1]

[1]Bangladesh University of Textiles, Dhaka, Bangladesh
[2]Manchester Metropolitan University, UK

Designers convert their innovative concepts into commercial products. Fashion products consume a large amount of raw materials that cause serious carbon footprint and create huge amount of wastes. Around 17-20% of global water pollution and 10% of global carbon emissions are generated from textile and fashion industry via both manufacturing and supply chain. The main goal of this study is to incorporate sustainability into new product development (NPD) for recovering from this current situation by providing some recommendations. For incorporating sustainability into fashion NPD, new design ideas are generated along with social, environmental and economic aspects of sustainability. The recommendations of this study are: (1) application of ZWPC technique in mass production of garment, (2) practicing slow-fashion by integrating Government strategy, engagement of industry members and other stakeholders, rearrangement of supply chains and significant consumer awareness for reducing carbon footprint and enhancing sustainability, (3) promoting sustainable fashion brands by advertising sustainable messages of a new collection through internet, (4) application of tools for sustainable fashion product design & development to assist designers and (5) building sustainable fashion supply chain to embed sustainability through every stage of the fashion and textile production.

Sustainable Fashion and Textiles Frameworks

Anna Romachney[1], Abu Sadat Muhammad Sayem[2] and Julfikar Haider[3]

[1]Microbiology and Molecular Biology, Manchester Metropolitan University, UK
[2]Manchester Fashion Institute, Manchester Metropolitan University, UK
[3]Department of Engineering, Manchester Metropolitan University, UK

The fashion and textiles industry imparts a large environmental burden due to the wide range of processes required for production. There is a call to generate a more sustainable production system. To this end, sustainable frameworks have been assessed to determine how this may be best achieved. From assessment of sustainable frameworks, defining sustainability and developing a common language was an imperative for a successful framework. This enables effective communication across different sectors and between different actors to allow collaboration to successfully occur, which underpins the success of all other framework aspects. The setting of goals and aims for achieving sustainability ensures that a clear path is being set. The utilisation of assessment methods and tools allows for the appropriate setting of realistic goals, they are essential to determining the course of action as well as for monitoring the processes to ensure they are meeting the goals set. Further to this, assessment of consumers enables the industry to produce what is in demand and produce in sufficient amounts. In terms of fashion and textiles, general consensus is a framework which shifts toward a circular economy. This shift would entail the development and utilisation of sustainable and recycled materials. As well, the minimisation and removal of hazardous chemicals and reduced use of water in processes across the whole system. A large call is for the recycling of clothing and developing the substantial means to enable this to be done successfully. What underlies all of these aspects required for circular economy is the utilisation of sufficient designing which takes into account all of the processes needed, enabling product longevity and its sustainable production.

Reusing Textile Desiccant Bags in Container Shipping of Textile goods

Marcel Beiß[1], Markus Muschkiet[1] and Yordan Kyosev[2]

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Up to now only single-use items are in use to regulate the crypto climate inside a container without using ventilation or controlled atmosphere. The aim of the research is to identify the necessary requirements and materials to develop a reusable textile desiccant bag for overseas shipping. Thus, reducing resources usage and possible the carbon dioxide footprint. To achieve this, the developing temperature and moisture levels inside a container during transport as well as the physical, chemical and biological requirements for desiccant and bag materials have to be taken into account. Furthermore, the absorption/desorption of the desiccant and the bag material for its performance after several cycles of reconditioning have to be evaluated. The reduction of the carbon dioxide footprint and resource use will be assessed by comparing the developed desiccant bag against a comparable single-use bag.

Rethinking Textile Fibres and Yarn Production Practices from Sustainability Point of View

Tanvir Mahady Dip[1], Abu Sadat Muhammad Sayem[2] and Julfikar Haider[2] and Abbas Uddin Shiyak[1]

[1]Bangladesh University of Textiles, Dhaka, Bangladesh
[2]Manchester Metropolitan University, UK

Textile is one of the most essential commodities of human life. Textile fibres are the building units for any textile product. Transformation of fibres into one dimensional continuous strand called yarn is one of the three major transformations in the whole textile value chain. Therefore, manufacturing of yarn is the very next step which contributes handsomely in designing and determining the performance of the end product. However, the existing manufacturing processes are not very clean when ecology is concerned. Numerous steps involved in the production of both the fibre and yarn continues to leave environmental footprints at each point. A total of 108300 thousand metric tons of fibres were produced worldwide in 2020. Around 60% of the total fibres are used for fashion industry. Global spun yarn production was 52.5 million tons in the year 2020 across over 20 countries. Looking at the volume of such products produced worldwide must raise concerns for the environmental sustainability for the upcoming days. The farming, cultivation, irrigation of the natural fibres, chemical synthesis, modification of synthetic fibres and yarn manufacturing steps consequently result in unwanted impacts like GHG generation, freshwater depletion, fossil fuel depletion, air particulate matter (PM) release, etc. This research work presents a complete environmental scenario by exploring mainly three areas within the origin of the basic raw material fibre to yarn manufacturing scope. The three areas mainly focus on showing the sustainability scenario of the current production practices within the scope, identifying some solutions to improve the situation and suggesting ways to implement those in practice.

Sustainable Fashion and Textile Production: A ManMet GCRF Project

Abu Sadat Muhammad Sayem[1] and Julfikar Haider[2]

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The Global Challenges Research Fund (GCRF) project being implemented by the Manchester Metropolitan University (ManMet) in Bangladesh, one of the top suppliers of fashion apparel to the global market, aims to build research capacity in zero-waste apparel production and material sustainability and to development of a framework for sustainable fashion and textile production in Bangladesh. A recent research conducted at ManMet and published in the Journal of Textile Institute (https://www.tandfonline.com/doi/full/10.1080/00405000.2020.1779636) demonstrated the successful application of Zero-Waste Pattern Cutting (ZWPC) into mass production of apparel to tackle over 60 billion square metres of scarp fabrics being produced by the global fashion industry annually. Previously, the practice of ZWPC was thought to be applicable only in atelier environment for designing and making one or two garments at a time. The ongoing research in partnership with the BGMEA University of Fashion & Technology (BUFT) and Bangladesh University of Textiles (BUTEX) has identified eight different styles of garments being produced in Bangladesh for the international market to enhance the ZWPC framework for those identified styles to implement it in Bangladesh apparel industry to achieve production sustainability through maximum fabric utilisation and waste minimisation. In addition to implementing ZWPC, it is also important to select sustainable materials in production to address the issues of carbon footprint and climate change potentials related to industrial production activities. Prior to conducting the research on ZWPC and LCA in Bangladesh context, the project is implementing a programme of research skill training on ZWPC and material sustainability including CAD and LCA software tools to build research capacity in those areas in Bangladesh. This presentation will provide an overview of the ManMet GCRF project being implemented in Bangladesh.

Keywords: Zero-waste apparel, research capacity, material sustainability

Success factors for last mile service providers based on the example of fashion e Commerce deliveries

Natalie van Bentum

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Success factors for last mile service providers based on the example of fashion e-Commerce deliveries: Accelerated by the developments of the COVID-pandemic, the share of e-Commerce orders in the product category of fashion has increased dramatically within the past years - from a 9% share in Germany in 2010 to a prognosed 50% share in 2030. Along with this shift comes an increased mail order volume for courier, express and packet service providers (CEP) that deliver the apparel products to the end consumers. The growing number of e-Commerce consignments results in higher traffic volumes, especially in inner-city areas. Congestion, noise pollution and increasing emissions result, creating a need to improve the last mile delivery of products purchased online. Furthermore, the last mile generates 50% of the total delivery costs for CEP which proves great potential for optimisation. Through research in the field of success factors, document analyses and expert interviews, critical factors and strategies are developed helping CEP to improve their performance and reduce the external traffic costs. So far, the findings show that characteristics of daily parcel traffic, consignment type, vehicle type, positioning time and the delivery process have to be adjusted to achieve more sustainable and successful deliveries.

An Overview on present scenario and recommendations towards sustainability issues in fabric manufacturing

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Textile, fashion and apparel industries are considered as one of the major contributors of global environmental footprint accounts for 10% of global carbon emissions since an array of environmental concern issues are associated with most of the production and processing of raw materials of textiles. The most significant of which are issues related to the use of fresh water, energy, chemicals as well as generation of wastes. Even fabric manufacturing mainly weaving or knitting technology which is one of the major steps of the textile value chain is not out of this concern. Study shows that weaving technology is more energy intensive, accounts for approximately 23% of total energy consumed in textile industry and in turn contributes more to global greenhouse gas (GHG) emissions as compared with knitting technology. The ever-growing global consumption of textile, fashion and apparel requires huge quantity of fabric which leads to the use of 1 billion KWh of energy, huge amount of water and 1.2 billion tonnes of GHGs emission. Moreover, the use of non-renewable energy, use of hazardous chemicals, generation of waste, generation of fiber fly, noise, these are the common challenging areas both for weaving and knitting to attain sustainability. The purpose of this research work is to assess sustainability across the fabric manufacturing industry followed by identifying the present practices, identifying opportunities for sustainable solutions and way forward to implement these solutions.

Environmental Sustainability Evaluation of Knit Manufacturing Factory in Bangladesh: A Case Study

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This paper investigates the environmental sustainability of three knit-dyeing facilities in Bangladesh as a case study with the help of Higg Index evaluation tools by the Sustainable Apparel Coalition (SAC). The Higg Index enables practitioners to determine and evaluate the sustainability index of textiles and apparel manufacturing facilities by scoring the environmental parameters, which includes seven (7) sub-domains e.g., (i) Environmental management system (ii) Energy use and Greenhouse gas emissions, (iii) Water use, (iv) Wastewater/Effluents, (v) Emissions of air, (vi) Waste Management and (vii) Chemicals Management. This research generates scores by asking multiple questions and structured interviewing the manufacturing practitioners out of 100 rating for a specific environmental dimension and reveals variable scores by the case factory A, B and C that indicate their environmental sustainability scenario. The cases study reveals the technical, managerial, and contextual limitations on practicing environmental sustainability by knit-dyeing industries in Bangladesh. The findings will urge all the stakeholders, including academics and particularly the practitioners to carefully consider issues in reducing environmental impact in manufacturing operations. The outcome will help industry practitioners with more comprehensive information to take strategic action plans in the knit-manufacturing industry in Bangladesh to achieve a higher level of sustainability.

Keywords: Environmental sustainability, Higg index tool, textiles, and apparel industry.

Immobilizing Catalysts on Textiles for Sustainable Development

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Catalysts are widely embraced as the central theme of sustainable chemistry as they influence the rate of chemical reactions without being consumed while saving time and energy. Catalysts are resalable if recovered. However, the complexity and limitations of catalysts separation process brought the relevance of catalysts immobilization where catalysts are bound on solid support material for easy recovery and subsequent reuse of immobilized catalysts. Catalysts immobilization faces inherent drawback related to complex preparation process, expensive support material and damages of catalysts during immobilization. Therefore, this study presents the feasibility of textile as inexpensive and robust support material for immobilization of inorganic, organic or biocatalysts. Polyester nonwoven fabric (PF) was chosen as textile support material for immobilization of catalysts. A combination of eco-friendly and resource efficient processes were explored for modification of PF to provide favorable surface for intended catalysts. Results showed tailor-made functionalities of PF surface were effective in immobilization of various catalysts. The resultant immobilized catalysts were explored in wastewater treatment, antibacterial textiles and other green chemistry applications. Results herein confirms the feasibility of textiles as potential support material for immobilization of catalysts for a wide range of applications.

KEYWORDS: Catalyst immobilization, Catalysis, Textile catalyst, Heterogeneous catalysts, Sustainability.

A Systematic review on Sustainability in Fashion Supply Chain (FSC) from emerging economy perspective

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Julfikar Haider[2], Ayub Nabi Khan and Rayed Barkat[1]
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This paper reviews the literature on supply chain in textile, apparel and fashion (TAF) industries from the perspective emerging economy's manufacturing firms. A systematic literature review was undertaken, consisting of bibliometric and content analysis of 85 articles published in peer-reviewed journals within 12 years of time.

The topic sustainability in Fashion Supply chain (FSC) has been covered in several research areas including environmental science, management and international business, transportation science and computer science. Most of these literatures investigate FSC from developed countries or retailers' perspective. This review includes the diversity and complexities of maintaining sustainability in FSC in the contexts of emerging economy firms, specifically TAF manufacturing firms.

This review provides academics with a unified depiction of sustainability in FSC to stimulate further scholarly research and provides guidance to standardize green FSC management in TAF manufacturing firms.

Keywords: Sustainability, Fashion supply chain, Emerging economy