

Preface

This is the second volume of a roadmap series on sustainable textiles and clothing. As discussed in Vol. 1, the textile and clothing supply chain represents a formidable threat to our living planet and the environmental footprint of this massive supply chain is of formidable size. Every life cycle of a piece of clothing, starting from the raw material stage, followed by the manufacturing process, transportation and retailing, consumer use, and the disposal phase is responsible for the creation of various potential environmental threats. This is the crux of the problem around which this second volume revolves and it will address this problem in detail. Following the first volume, which dealt with the eco-friendly raw materials, technologies, and processing methods employed to produce a sustainable textile product, this second volume is intended to deal with the environmental and social impacts of the textiles and clothing sector. This quite lengthy topic is discussed in this volume in ten very informative chapters.

“[Environmental Impacts of the Textile Industry and Its Assessment Through Life Cycle Assessment](#)”—presents an outline of environmental impacts pertaining to the textiles and clothing sector. Using the life cycle phases of textile products as a base, this chapter deals with the various potential environmental issues, such as the consumption of water, energy, chemicals, packaging materials, waste generation, and the corresponding environmental impact caused by the textile sector.

Clothing consumption is responsible for a major share of total life cycle impacts created by textile products. Though the percentage contribution of the consumption phase to the total environmental impacts is highly variable for various textile products and depends on many factors, from the outset this phase contributes significantly. This is evident from the many research studies on life cycle assessment of clothing products conducted so far. Hence this volume has a chapter to deal with this very important aspect: “[Environmentally Sustainable Clothing Consumption: Knowledge, Attitudes, and Behavior](#)”. This chapter presents an overview of environmentally sustainable clothing consumption and disseminates information pertaining to the knowledge and attitudes of apparel consumers towards the various potential environmental issues related to the different life cycle phases of a textile product. It also presents the details of current consumer engagement levels in environmentally sustainable clothing consumption and an interesting analysis of the relationships between knowledge, attitudes, and clothing consumer behavior.

“Emerging Green Technologies and Environment Friendly Products for Sustainable Textiles”—deals with the details of various green technologies (such as supercritical carbon dioxide dyeing, plasma technology, and ultrasonic dyeing) to replace conventional textile wet processes, which are found to be environmentally detrimental. It also discusses the application of sustainable materials and utilization of by-products from other industries to achieve sustainable textile products.

Any product, including a textile product, is expected to be disposed of at the end of its life without environmental implications. This concept is addressed by biodegradation and the next chapter, **“Biodegradation Studies of Textiles and Clothing Products”**—revolves around this concept and discusses the biodegradation of textiles and clothing products. It addresses minute details pertaining to biodegradation, ranging from the mechanism behind it and the different factors influencing biodegradation, methods, techniques, and conditions of biodegradation assessment. It also presents an overview of biodegradation behavior and studies related to various textile and clothing products.

“Responsibility Without Means”—discusses the consumer phase of clothing products. It deals with consumer behaviour towards environmental impacts of clothing and investigates how consumers can help to reduce these environmental impacts together with the capability and willingness of customers to change their behaviour. Details are presented in the light of the results derived from the outcome of two research projects on environmental challenges connected to textiles and clothing in this chapter. Two research questions posed were elucidated with the aid of data from various desktop studies, in-depth interviews in combination with wardrobe studies, and consumer surveys.

“Environmental Analysis of Textile Value Chain: An Overview”—covers the environmental impacts of the textile value chain. Beginning by highlighting the environmental and social impacts of textiles and clothing sector, this chapter contains detailed discussions on various potential environmental impact areas of the clothing sector. It also deals with the environmental impacts of fibres and the various textile processes involved in the clothing and apparel production chain, along with a brief note on consumer responsibility.

“Who Influence the Environmental Adaptation Process of Small and Medium Sized Textile and Garment Companies in Vietnam?”—deals with the case study of Vietnam SMEs (Small and Medium sized Enterprises). This chapter begins with an overview of SMEs and the textile and garment sector in Vietnam. Discussing whether the stakeholders’ involved in the environmental adaptation process is the first step to fill the related knowledge gap, this chapter briefs the stakeholders’ theory. Stakeholders in this sector in Vietnam are dealt with in detail.

“The SURF Framework Applied to the Textile Industry”—deals with the details pertaining to the SURF (Supply chain, User, Relations, and Future) Framework, which addresses the quadruple bottom line of sustainability: social, environmental, economic, and intergenerational equity results and application to the textile industry. It includes discussions related to various textile-specific initiatives, standards, methods, and tools that relate to each component of SURF and

presents interesting case studies on application of the SURF Framework to cotton textiles and to two different companies that sell cotton shoes and jeans, respectively.

“Sustainable Business Development Through Designing Approaches for Fashion Value Chains”—identifies and discusses the various challenges posed to the fashion value chain and the environmental, economic, and social impacts of the same. Having discussed the concept and model of sustainable business development, detailed discussions pertaining to a holistic designing approach on sustainable business development on fashion value chain are presented.

“Eco-friendly Coloration and Functionalization of Textile Using Plant Extracts”—includes discussion of the extraction and characterization of plant molecules suitable for textile coloration. Sustainable textile processing and finishing using plant molecules, textile coloration with the aid of natural dyes, and various natural dyes and their dyeing processes are also covered along with details pertaining to health and hygienic textiles and various other textile factors such as flame retardancy and producing well-being textiles using plant molecules.

I would like to take this opportunity to thank all the contributors of the different chapters included in this second volume of roadmap to sustainable textiles and clothing for their timely efforts in bringing out this book successfully with enriched technical content in their chapters. I have no doubt that the readers will benefit from this book which brings out the important details associated with the environmental and social impacts of the textiles and clothing sector. This second volume in the roadmap series of sustainable textiles and clothing will certainly become an important reference for the researchers and students, industrialists, and sustainability professionals working in this field.

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