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# Sustainable textiles

## Life cycle and environmental impact

Edited by  
R. S. Blackburn



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Preface

Developing economies together with the increasing global population are having a direct impact upon production and consumption of both fossil and natural resources. This has the potential to lead to further significant environmental degradation if appropriate measures are not put in place to control, manage or mitigate the impact of such developments. There is a need wherever possible to dissociate growth from increased consumption of fossil fuels, water, energy, and reduce the use and resulting impact upon natural resources. Output to the environment from production and waste must also be reduced in volume and impact.

'Sustainability' has become a ubiquitous word, but what level of understanding exists in terms of what constitutes a sustainable product or process? Most people would associate sustainability with environment, but many would not consider that sustainability also embraces economy: the comment that products 'should not cost the earth' genuinely has a double meaning – both meanings being equally important. The third aspect of sustainability is impact on society: sustainable textiles should not cause detriment to those societies where products are grown or disposed of, and workers in textiles supply chains should not be exposed to hazardous working conditions.

Misunderstanding of what is 'good' and 'bad' prevails, not just from the consumer, but within the textiles industry. Terms like 'organic', 'natural' and 'biodegradable' are generally perceived to be 'good', whereas 'GM', 'synthetic', and 'chemical' are perceived to be 'bad'; an interesting perspective considering that water is a chemical (dihydrogenoxide) and arsenic is natural. Many of these terms are used cleverly to market claimed sustainability benefits, but a product can only be sustainable when the whole 'cradle-to-grave' life cycle is sustainable.

A previous book in this series entitled *Biodegradable and sustainable fibres* concentrated largely upon fibres that were sustainable in terms of the raw materials from which they were produced and also their potential for disposal through degradation processes. However, this perspective examines only the 'cradle' and 'grave' of textiles and does not look at everything

1 else that goes on in the textiles supply chain, one of the longest and most  
2 complicated supply chains of any industrial product. While it is positive to  
3 utilise renewable and/or biodegradable (the two terms are mutually exclu-  
4 sive) resources as the starting materials for textile products, arguably the  
5 most significant contributions to product life cycle sustainability are energy  
6 and water savings in processing, as these savings usually realise an eco-  
7 nomic benefit also.

8 In this book, sustainability through the textiles supply chain will be exam-  
9 ined. The first chapter considers the designer's perspective in achieving  
10 sustainable textiles, how the designer must take into account the technolo-  
11 gies available and how to achieve desirable fashion at the same time as  
12 reducing the use of resources and the generation of waste. Two subsequent  
13 chapters consider two natural fibres in existence for millennia – cotton and  
14 wool – and how the processing of these fibres can be sustainable into the  
15 future, before the fourth chapter discusses new sustainable synthetic fibres.  
16 Sustainability in the wet processing stages of preparation, dyeing, and fin-  
17 ishing are considered in three separate chapters on enzyme biotechnology,  
18 key sustainability issues in dyeing, and environmentally friendly plasma  
19 technologies, respectively. Supply chain sustainability is completed with a  
20 chapter examining systems in textile recycling.

21 The second half of this book presents applications and case studies in  
22 sustainable textiles, with chapters focusing on recycled fibres, eco-labelling,  
23 organic cotton, nanotechnology, nonwovens, flame-retardants, and a final  
24 chapter examining systems change for sustainability in textiles.

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26 *R. S. Blackburn*  
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