



ADDRESSING SCP IN THE FASHION AND APPAREL SECTOR

SCOPING STUDY



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Acknowledgement

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Abstract

The SWITCH-Asia Programme, launched in 2007 with funding from the European Union, achieved more than a decade of progress on sustainable consumption and production across Asia. In October 2017, the SWITCH-Asia II Programme established the SWITCH-Asia SCP Facility (SCPF) in Bangkok. SCPF has the mandate to strengthen the implementation of sustainable consumption and production (SCP) policies at the national and sub-national levels through awareness raising for the topic, scaling-up of good practice examples, and through capacity building for stakeholders. The facility also aims to enhance networking among key stakeholders on SCP by creating an internal dialogue between components of the programme (the EU Grant Projects and the Regional Policy Advocacy Component/RPAC implemented by UN Environment) and an external dialogue by communicating results of the programme to relevant stakeholders.

The programme aims at promoting sustainable growth to contribute to green economic development, poverty reduction, and mitigation of climate change in Asia. While many countries in Asia have made progress on some aspects of SCP, more action is required to ensure an effective transition toward sustainable development. Production systems need to become more innovative and efficient; consumption patterns should focus on becoming more responsible and aware. To that end, effective implementation mechanisms, result-oriented actionable policies, relevant tools and market instruments, as well as adequate governance and partnership systems are required. In most Asian countries, resource and energy efficient technologies exist and could be applied in current growth sectors, such as construction, housing and infrastructure, manufacturing, and also the textile and leather sectors. Consideration of health and environmental impacts as well as employment conditions, notably women, should be targets during innovation rollouts. Considering the exhaustive expansion and general access to smart phones and tablets nowadays, e-media is a critical tool to further promote responsible consumption and production by inducing Asian societies to take ownership of the implementation of the SDGs as a whole and SDG12 targeting sustainable production and consumption in particular.

The following study clustered target countries in regards to SCP-policy related development and implementation progress, as well as the gaps and action required regarding the SCP framework. The main objective of the scoping study is to define the scope and challenges regarding SCP in the fashion and apparel sector to better identify thematic priority areas for a regional action programme at national level to develop approaches and resolutions to some of the most persistent and critical issues, such as safety and working conditions, gender, health, water use and chemical products, waste generation and management, alternative energy use, resource efficiency, eco-labelling and procurement, as well as sustainable consumption behaviour along the entire value chain of the fashion and apparel sector.

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Abbreviations

10YFP	10 Year Framework of Programmes
ADB	Asian Development Bank
ASEAN	Association of Southeast Asian Nation
ASEF	Asia-Europe Foundation
ASEIC	ASEM SMEs Eco-Innovation Centre
AFTEX	ASEAN Federation of Textile Industries
BAT	Best Available Technologies
BATNEC	BAT not Entailing Cost
BEPI	Business Environment Performance Improvement
BGMEA	Bangladesh Garment Manufacturers and Exporters Association
BMZ	Bundesministerium für Wirtschaftliche Zusammenarbeit und Kooperation – Federal Ministry for Economic Cooperation and Development
BOD	Biological Oxygen Demand
BREF	BAT Reference Document
BUFT	Bangladesh University of Fashion Technology
BSCI	Business Social Compliance Initiative
CAD	Computer-Aided Design
CAGR	Compound Annual Growth Rate
CASME	China Association of Small and Medium Enterprises
CCEL	Certification Committee for Environmental Labelling Products
CE	Circular Economy
CETP	Common Effluent Treatment Plant
CGPN	Green Purchasing Network
CIS	Centre for Industrial Sustainability
CITES	Convention on International Trade in Endangered Species
CLE	Council of Leather Exports
CNTAC	China National textile and Apparel Council
CMP	Cut, Make and Package
CMT	Cut-Make-Trim
COD	Chemical Oxygen Demand
CPF	Country Partnership Framework
CSBTS	China State Bureau of Technology Supervision
CSR	Corporate Social Responsibility

DCCI	Dhaka Chamber of Commerce and Industry
DIFE	Department of Inspection for Factories and Establishments
DoE	Department of Environment
EBRD	European bank for Reconstruction and Development
EIB	European Investment Bank
EIP	Eco-Industrial Park
EMS	Environment Management System
ENVforum	Asia-Europe Environment Forum
EPR	Extended Producer Responsibility
EU	European Union
FAO	Food and Agriculture Organization
FDI	Foreign Direct Investment
FTA	Foreign Trade Association
FOC	Free of Chrome
FYP	Five Year Plan
GDP	Gross Domestic product
GERES	Group for the Environment, Renewable Energy and Solidarity
GGGI	Global Green Growth Institute
GHG	Green House Gas
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GMAC	Garment Manufacturers Association
GPP	Green Public Procurement
HEST	Higher Education Network for Sustainable Textile
HSF	Hanns Seidel Foundation
IED	Industrial Emission Directive
IFC	International Finance Corporation
IFLADP	Indian Footwear, Leather & Accessories Development Programme
IGES	Institute for Global Environmental Strategies
ILO	International Labour Organization
IMO	Institute for Market Ecology
IPE	Institute of Public & Environmental Affairs
IPi	Swiss Federal Institute of Intellectual Property
IPPC	Integrated Pollution Prevention and Control
ISC	Institute of Standards of Cambodia
ITC	International Trade Centre
ISO	International Organization for Standardization

IWGGG	Inter-Ministerial Working Group on Green Growth
JAAF	Joint Apparel Association Forum
KEMI	Kemikalieinspektionen (Swedish Chemicals Agency)
LDC	Least Developed Country
LEED	Leadership in Energy and Environmental Design
LFMEAB	Leather Goods and Footwear Manufacturers & Exporters Association of Bangladesh
LOHAS	Lifestyle of Health and Sustainability
LWG	Leather Working Group
MAC	Multi-Stakeholder Advisory Committee
MEGDT	Ministry of Environment, Green Development, and Tourism
MoNRE	Ministry of Environment and Natural Resources
MPI	Ministry of Planning and Investment
MSFA	Mongolian Sustainable Finance Association
MSME	Micro, Small & Medium Enterprises
NCDP	National Green Development Policy
NCPC	National Cleaner Production Centre
NGO	Non-Governmental Organisation
NGGS	National Green Growth Secretariat
NEPA	National Environmental Protection Agency
NIWE	National Institute for Wind Energy
NSDP	National Strategic Development Plan
NSDS	National Sustainable Development Strategy
NUOL	University and National University of Laos
OECD	Organisation for Economic Co-operation and Development
OSH	Occupational Safety and Health
PACT	Partnership for Cleaner Textiles
PAGE	Partnership for Action on Green Economy
PEFC	Program for the Endorsement of Forest Certification
POP	Persistent Organic Pollutant
PST	Partnerships for Sustainable Textiles
PSE	Public Sector Enterprise
PSES	Programme for Promotion of Social and Environmental Standards
PU	Polyurethane
PVC	Polyvinylchloride
R&D	Research and Development
REACH	Regulation, Evaluation, Authorization and Restriction of Chemicals

RECP	Resource Efficient and Cleaner Production
RKDF	Russian-Kyrgyz Development Fund
RMG	Ready-Made Garments
SAC	Sustainable Apparel Coalition
SAFSA	Source ASEAN Full Service Alliance
SBN	Sustainable Banking Network
SCAP	Sustainable Clothing Action Plan
SCP	Sustainable Consumption and Production
SCPF	Sustainable Consumption and Production Facility
SDG	Sustainable Development Goals
SEI	Stockholm Environment Institute
SFA	Sustainable Fibre Alliances
SLE	Social and Labour Standards in the Textile and Garment Sector in Asia
SME	Small and Medium Enterprise
SPP	Sustainable Public Procurement
SSREU	Support of Safety Retrofits and Environmental Upgrades in the Bangladeshi RMG Sector
STeP	Sustainable Textile Production
TCF	Textile, clothing and footwear
TDS	Total Dissolved Solids
TSP	Textile Sustainability Platform
UBA	Umweltbundesamt - German Federal Environmental Protection Agency
UNECE	United Nations Economic Commission for Europe
UNEP	United National Environment Programme
UNDP	United Nations Development Programme
UNIDO	United Nations Industrial Development Organisation
USGBC	Green Building Rating System of the US Green Building Council
VCCI	Vietnam Chamber of Commerce and Industry
VIP	Vietnam Improvement Program
VITAS	Vietnam Textile and Apparel Association
WBG	World Bank Group
WDF	Washing, Dying & Finishing
WEPA	Water Environment Partnership
WFTO	World Fair Trade Organization
WWF	World Wildlife Fund
ZDHC	Zero Discharge of Hazardous Chemicals
ZLD	Zero liquid discharge

1 Introduction

The SWITCH-Asia Programme, launched in 2007 with funding from the European Union, achieved more than a decade of progress on sustainable consumption and production (SCP) across Asia. In October 2017, the SWITCH-Asia II Programme established the SWITCH-Asia SCP Facility (SCPF) in Bangkok. SCPF has the mandate to strengthen the implementation of SCP policies at the national and sub-national levels through awareness raising for the topic, scaling-up of good practice examples, and through capacity building for stakeholders. The facility also aims to enhance networking among key stakeholder on SCP by creating an internal dialogue between components of the programme (the EU Grant Projects and the Regional Policy Advocacy Component/RPAC implemented by UN Environment) and an external dialogue by communicating results of the programme to relevant stakeholders.

In line with the overall objective of the SCP Facility, this scoping study addresses SCP in the fashion and apparel sector to better define the subject's scope, identify challenges persistent to the topic, and determine thematic priority areas for a regional action programme at the national level. Based on a situational analysis undertaken in consultation with the European Commission, SCPF developed a cluster matrix of country groupings and priority themes. In this context, the term "textile sector" refers to (a) fibre (natural, synthetic) production (b) textile finishing and (c) garment/apparel manufacturing. In a few selected countries, this scope was expanded to also include different production stages such as apparel processing, and other materials such as leather, silk and wool. In case of the leather sector, this covers the production of natural leather (tanning of skins and hides, other than "synthetic" leather¹) as well as the conversion of leather into leather products (e.g. footwear, garments, goods and upholstery) but does not include animal husbandry and slaughtering.

Possible intervention areas could be textile/leather waste re-purpose, waste handling and disposal including textile/leather wastewater treatment plant technology and management, waste-to-energy and energy efficiency to substitute the conservative energy source for the factory and facility (e.g. office, dorms for labourers, other utilities), sustainable transport in the textile/garment sector, specifically for female workers, as well as work environment health and safety. Apart from the production side, a major influencing handle regarding SCP is stimulating the consumption side, for example through the implementation of eco-labels and Green/Sustainable Public procurement (GPP/SPP).

¹ Synthetic materials (also known as synthetic, faux, imitation, vegan or PU leather) is a synthetic material that holds the appearance of leather but is not made from animal skin or hide like genuine leather. The synthetic material consists of natural and/or synthetic fibres, coated with a plastic polymer or similar. Synthetic material is usually made from polyurethane (PU), polyvinylchloride (PVC) or textile-polymer composite microfibrils.

Table 1: Overview of Southeast Asian countries and sectors covered

Country	Sectors covered			
Bangladesh	Textile	RMG	Tannery	Leather products
Cambodia		RMG		
China	Textile	RMG	Tannery	Leather products
India	<i>Textile</i>	<i>RMG</i>	Tannery	Leather products
Indonesia			Tannery	Leather products
Laos		RMG		
Mongolia		RMG	Tannery	Leather products
Myanmar	Textile	RMG		
Pakistan	<i>Textile</i>	<i>RMG</i>	Tannery	Leather products
Sri Lanka	Textile	RMG	Tannery	Leather products
Vietnam	Textile	RMG		

Note: Sectors in *italic* play an important role in the country's economy but have not been specifically covered as part of the analysis according to the Terms of Reference.

Table 2: Overview of Central Asian countries and sectors covered

Country	Sectors covered				
Kazakhstan	Textile	Leather		Wool	RMG
Kyrgyzstan	Textile	Leather		Wool	RMG
Tajikistan	Textile		Sericulture	Wool	RMG
Turkmenistan	Textile	Leather	Sericulture	Wool	RMG
Uzbekistan	Textile	Leather	Sericulture	Wool	RMG

Note: Sectors in *italic* play an important role in the country's economy but have not been specifically covered as part of the analysis according to the Terms of Reference.

2 Sectoral sustainability framework condition in Asia

2.1 Textile/garment sector

Driven by a growing middle-class across the globe and specifically in Asia, as well as increased per capita sales in mature economies worldwide, clothing production has nearly doubled over the last 15 years (Ellen MacArthur Foundation 2017). The rise can be attributed to the 'fast fashion' phenomenon, marked by quicker turnarounds of new styles, increased number of collections offered per year, lower prices and a declining cloth utilisation rate.

2.1.1 Market development

Until the seventeenth century, textile production was a predominantly specialised domestic production system (cottage industry) mainly falling into the domain of women's work (Gordon 2011). Depending on the region, key fibres used were wool, cotton, silk, hemp flax (for linen) and/or jute. The Industrial Revolution led to an increasing mechanisation of the production process, allowing new and much faster methods of manufacturing to emerge. Over the following 300 years, the textile sector landscape was influenced by developments in processing engineering and advances in engineered fibres. Whilst the first man-made or manufactured fibres, namely regenerated cellulose fibres, were developed in the late nineteenth century, their industrial production only started in the early twentieth century. Synthetic fibres were developed in the late 1930s and production took off after the Second World War. The quest of the 21st century has been to create fibres that are functional, sustainable, and adaptable to changing needs of today's users (Braddock and Harris 2012; Aldrich 2007).

The two basic types of fibre groups are (a) natural fibres (plant-based, animal-based e.g. hair, silk, wool, and mineral e.g. asbestos) and (b) man-made fibres (such as regenerated ones e.g. bamboo cellulose or viscose/rayon; synthetic polymers, inorganic e.g. carbon, ceramic, metallic, new generation of cellulose-based fabrics such as lyocell). The range of functions offered by those different fibre groups has begun to push traditional boundaries. In response to market trends, the textile industry is moving ahead with the development of new textile materials and fabrics, incorporating smart functions into the fabrics, using nano and biotechnology know-how, sensory functions, wearable electronics and the Internet of Things. In addition to enhanced functionalities, R&D and product innovation aim at increasing comfort, wellness, freshness, and care for the consumer. In 2018, the world production of all fibre reached 111 million metric tons, an increase by four million tons compared to 2017, and 35 million tons over the past decade. As per 2018, the world production of fibre was 32 million natural fibres (an increase of less than 2 million tons over the last 10 years), 50 million tons of synthetic filaments (of which 45 million tons are polyester filament) and 7 million tons of cellulosic fibres, as well as synthetic staple production accounting for 22 million tons. Around 80 billion new garments are produced globally every year. Global consumption of clothes doubled between 2000 and 2014 ([Remy et al. 2016](#)).

On a global average, every person buys 5kg of clothes per year, but in Europe and the USA this figure is as high as 16kg (Muthu eds. (2015), Handbook of Sustainable Apparel Production, CRC Press Boca Raton). Overall apparel consumption is projected to rise even further from 62 million tonnes in 2015 to 102 million tonnes in 2030. This projected increase in global fashion consumption will create further environmental stress and risks ([Global Fashion Agenda and Boston Consulting Group 2017](#)).

The global population is expected to rise to about 8.5 billion people by 2030 (and even more until 2040); GDP per capita is assumed to grow at 2% per year in the developed and 4% in the developing world respectively. Global apparel consumption is therefore likely to increase by 63% from 62 million tons

(2016/2017) to 102 million tons in 2030. This is an equivalent of more than 500 billion T-shirts. This soaring current and future demand for apparel will see the annual retail value of apparel and footwear reach a minimum of US\$ 2.3 trillion by 2030 (a more than 30% increase of US\$ 590 billion compared to current numbers) (The Global Fashion Agenda & Boston Consulting Group, 2017).

Revenue in the fashion segment is expected to amount to USD 338,692 million in 2019, and to show an annual growth rate (CAGR 2019-2023) of 11.3%, resulting in a market volume of USD 519,193 million by 2023. The market's largest segment is apparel with a market volume of USD 220,521 million in 2019. China is now the fastest growing market for luxury fashion and will overtake the US as the world's largest fashion market for the first time in history (<https://qz.com/1482850/china-is-set-to-overtake-the-us-as-the-worlds-largest-fashion-market/>). Valued at nearly EUR 420 billion in 2016, the global market for high-end shoes, apparel, watches, and bags is expected to grow to EUR 500 billion by 2020, with the premium segment overtaking the top luxury segment as the main driver of growth.

The Asia-Pacific region and emerging economies, such as China, India, Russia, and Brazil are entering a stage of growing urbanisation, accompanied by a corresponding increase of residential construction and a growing middle class with higher disposable incomes and lifestyle aspirations: all powerful drivers for the apparel market. The rising consumer demand for innovative and styled clothing products will be a key factor steering the market growth in the coming years.

2.1.2 Sustainability concerns

In a business-as-usual scenario, the sector's development will have significant environmental implications on existing and emerging manufacturing locations with regards to waste management at the products' end-of-life phase. From 2010 to 2015, the volume of clothing and apparel sales doubled from around 50 bn units to more than 100 bn units ([Ellen MacArthur Foundation 2017](#)). At the same time, the clothing utilisation rate (average rate of a unit being used before its disposal) has steadily dropped. The average person buys 60 % more items of clothing and keeps them for about half as long as 15 years ago (Greenpeace (2017, p. 12). This 'take-make-dispose' system ('fast fashion') is extremely wasteful on resources and has severe consequences for the environment ([Ellen MacArthur Foundation 2017](#)).

Sustainability issues arise along all stages of the value chain of apparel and textile production. Whilst the environmental implications caused by the production of fibre differ depending on its type, the production of many natural fibres, such as cotton, causes concern due to the application of fertilisers (leading to eutrophication and groundwater pollution), pesticides and herbicides (leading to pollution, biodiversity loss and health impact for farmers and agricultural workers), water and energy use for irrigation (often in water-scarce regions), as well as GHG emissions from fertiliser production and the use of irrigation systems ([Retail Forum for Sustainability 2013](#)). Other natural fibres, such as viscose, which is fabricated from wood do require large amounts of chemicals and energy if fabricated using conventional methods. Also, even though wood is a renewable resource as is cotton, it is not without limits and strict criteria need to be applied in order to make its production truly sustainable ([Greenpeace 2017a](#)).

Table 3: Overview of fibre categories and relevance for focus countries

	Country	Fibre Production	Yarn Production	Cloth Production	Cut-Make-Trim	Consumption
South-East Asia	Bangladesh	Neglectable	Medium	Medium-High	High	Export
	Cambodia	Neglectable	Neglectable	Low	Medium-High	Export
	China	Medium-High	Medium-High	High	High	Export + Domestic
	India	Medium-High	Medium-High	Medium-High	Medium-High	Export + Domestic
	Lao PDR	Neglectable	Neglectable	Neglectable	High	Export
	Mongolia	Medium (Wool)	Medium	Medium	Medium	Export
	Myanmar	Neglectable	Low	Low	High	Export
	Pakistan	Medium-High	Medium-High	Medium-High	High	Export
	Sri Lanka	Neglectable	Neglectable	Low	High	Export + Domestic
	Vietnam	Low	Low	Medium	High	Export + Domestic
Central Asia	Kazakhstan	Low	Low	Low	High	Mostly Domestic
	Kyrgyzstan	High	Low	Low	Low	Domestic
	Tajikistan	Medium-High	Medium	Neglectable	Low	Export + Domestic
	Turkmenistan	Medium-High	Medium	Medium	Medium-High	Mostly Domestic
	Uzbekistan	Medium-High	Medium	Medium	Medium-High	Export + Domestic

Synthetic fibres, such as polyester and nylon, are essentially produced from oil and hence associated with all environmental problems caused by oil production including GHG emissions. In 2015, GHG emissions from textile production totalled 1.2 bn tonnes of CO₂ equivalent, 21 times more than those of all international flights and maritime shipping combined ([Ellen MacArthur Foundation 2017](#)). This is a real issue since more than 60% of today's clothing does include polyester which according to Greenpeace is a main driver of the 'fast fashion' phenomenon due to its low cost and versatility ([Greenpeace 2017a](#)).

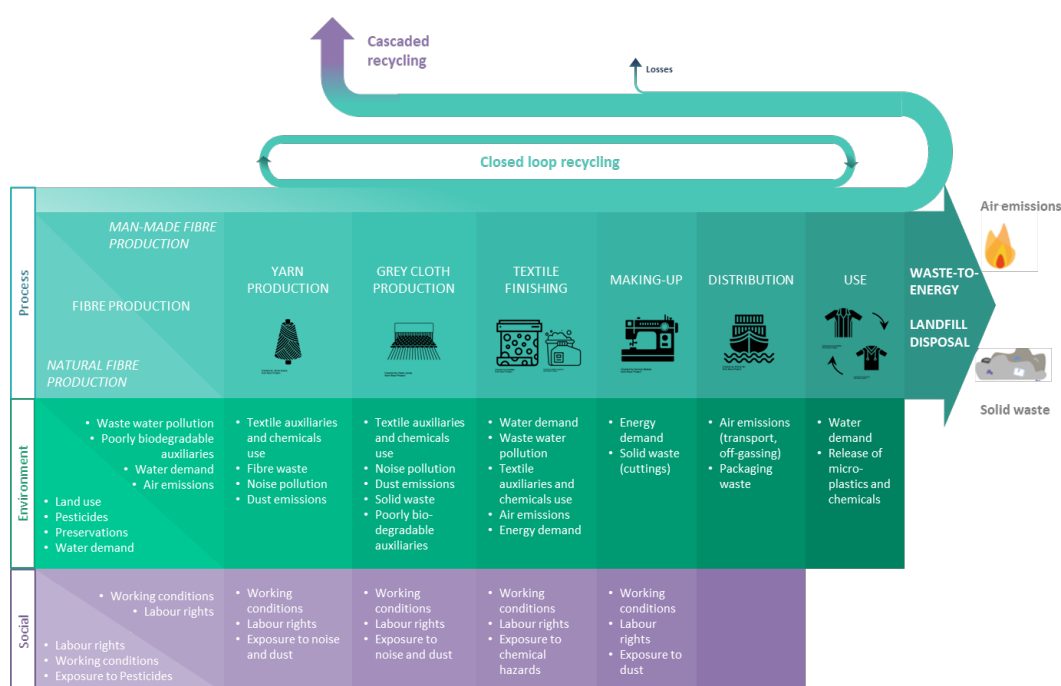
The production stage of apparel is a huge generator of industrial wastewater. The World Bank estimates that 20% of industrial wastewater pollution worldwide originates from the textile industry (Kant 2012). In addition to wastewater, textile production contributes to chemical solid waste, sludge as well as air emissions (IFC 2007). While there is little data on the volume of substances of concern used across the industry, the production stage is associated with the usage of large amounts of water and toxics, the production of hazardous waste and effluent including the use of chemicals, dyes and finishes during pre-treatment impacting factory workers, the surrounding environment and people dependent on that environment in terms of fishing, drinking, bathing and/or food production ([Retail Forum for Sustainability 2013](#)) ([Ellen MacArthur Foundation 2017](#)). Beside environmental problems in the production stage, workers are often subject to bad working conditions that force them to work under constant time pressure, uncompensated over time or even slavery like conditions and child labour ([Ellen MacArthur Foundation 2017](#)).

Environmental issues at the usage stage of fashion and apparel products are moreover associated with high amounts of energy and water usage, as well as the release of ecotoxic materials from detergents during washing and dyeing of clothing as well as the release of microfibers during this process ([Retail Forum for Sustainability 2013](#)). Synthetic fibres, which nowadays are part of the majority of clothing, release amounts of micro plastic during every single wash. These micro plastic particles then find their way into oceans, our food system and other ecosystems. Current practices contribute to around 0.5 million tonnes of annual microfibre leakages into the oceans. Under a business-as-usual scenario, the growth in material volume of textiles would see an increasing amount of non-renewable inputs up to 300 million tonnes per year by 2050. Considering this trend, the amount of plastic microfibres entering the ocean between 2015 and 2050 could accumulate to 22 million tonnes – about two thirds of the plastic-based fibres currently used to produce garments annually (Ellen MacArthur Foundation 2017).

After the usage stage of our clothing, which is becoming shorter and shorter, we dispose of our clothes one way or another. Of the total fibre input used for clothing, 87% is landfilled or incinerated; a staggering 73% of clothing ends up in landfill or incineration at their end of life. The Swedish Chemicals Agency (KEMI) estimates that substances of concern that are contained in those textiles, such as remaining dyes

or chemicals applied during production or use, can leak out of the textiles as they degrade, potentially releasing over 2,000 tonnes of hazardous colourants in the EU each year alone. If the waste is incinerated without controlling emissions, the combustion gases are likely to contain harmful substances (KEMI 2014). Less than 1% of material used to produce clothing is recycled into new clothing, representing a loss of more than US\$ 100 billion worth of materials each year.

Figure 1: Issues along the textile lifecycle (adapted from Ellen McArthur F.)



The textile and apparel industry mostly relies on non-renewable resources – 98 million tonnes in total per year – including oil to produce synthetic fibres, fertilisers to grow cotton, and chemicals to produce, dye, and finish fibres and textiles. With its low rates of utilisation (leading to high levels of throughput) and low levels of recycling, the current wasteful, linear system is the root cause of this massive and ever expanding pressure on resources (Ellen Mc Arthur). Thus, the concerns about environment and health implications have emerged as a major factor in overall market development. These concerns are by no means restricted to the USA and Europe. Apart from consumers’ concern for potentially harmful chemicals contained in final products, the entire value chain has fallen under scrutiny over the past 15 years. Campaigns, such as Detox of Greenpeace launched in 2011 aiming at toxic-free production by 2020 through the elimination of 11 priority chemical groups (Greenpeace 2017b), created additional public pressure for players along the value chain including suppliers of textile chemicals. Though the overall economic benefits of phasing out substances of concern is difficult to assess due to still low transparency on chemical use and a lack of data on worker-related health impacts, it is estimated that eliminating today’s negative health impacts emanating from poor chemical management (Boston Consulting Group 2017) in the textile industry would result in an economic benefit of 7 billion € (8 billion USD) annually by 2030 (Boston Consulting Group 2017).

2.1.3 Outlook and trends

Stringent environmental regulation, restrictions on specific chemicals/chemical groups along the value chain, growing pressure through international buyers and campaigners (e.g. the DETOX campaign by Greenpeace), industry-driven initiatives (e.g. Zero Discharge of Hazardous Chemicals - ZDHC, blue sign), as well as the wider consideration of circular economy (CE) concepts drive and dominate the changes and innovations in the textile and apparel sector. Leading brands and young start-ups alike are increasingly offering 'green' and 'sustainable' collections ([Ellen MacArthur Foundation 2017](#)). Current efforts by international brands, manufacturers and consumer groups focus on increasing the transparency in international textile/leather supply chains. A survey among 100 leading fashion brands, participating in the Fashion Transparency Index Initiative by Fashion Revolution, indicate an increase from 12.5% to 32% of brands revealing information about their first tier fashion supply chain ([Fashion Revolution 2017](#)).

Whilst fashion consumers cannot be treated as one homogenous group, the demand for 'fast fashion' has seen continuous growth. The majority of 'fast fashion' consumers can be considered the generation of female millennials living in Europe and North America, but also growing numbers of Asian middle and upper class consumers, especially in China, India and Indonesia, have taken to the 'fast fashion' trend. At the same time, the idea of 'slow fashion' is entering the scene advocating the reduction of consumption, preferring quality over quantity, and increasing the emphasis on sustainability aspects of product and production. Consumer movements that are actively seeking and demanding more information and transparency about the circumstances under which their clothing has been produced have begun to emerge. Thanks to the spread of the internet and online buying, millennial consumers can go as far as to investigating the entire supply chain on the subjects of transparency and ethical operations, prior to making a purchase (Shen et al. 2012). The content of the clothing items has also become an increasingly important factor in purchase decision making process of modern consumers (Shen et al. 2012). With sustainability reports and higher transparency, consumers have enough access to knowledge and information regarding apparel production issues to assess whether a company and specific products are able to or fail to meet their own sustainability demands. Upcoming alternative consumption and lifestyle trends, such as minimalism, zero waste and slow fashion, advocating the reduction of consumption have not gone unnoticed by the fashion industry. This increased awareness has given rise to innovative consumption models representing alternatives to the fast fashion market, such as second-hand, swap and sharing platforms as well as tailoring and upcycling. The reuse or resale of textile products is also gaining popularity. According to thredUP, fashion/apparel, resale has grown 21 times faster than the retail apparel market over the past three years (volume expected to grow from USD 5 billion in 2018 to USD 23 billion by 2023). Another trend is reviving the clothing repair industry that do mending and repair. Sweden, for example, has removed VAT for small companies in this line of business.

This increased awareness among consumers who are more informed today than they were five years ago has started to disrupt the market for 'fast fashion' and constitutes a driving pressure for the industry to improve their sustainability performance. Some fashion brands have led or participated in voluntary initiatives to limit reputational risks. In some areas where too few binding regulations existed, the private sector has outpaced the public sector in stepping forward. Occasionally, private initiatives even acted as points of reference for building regulatory frameworks. These voluntary nongovernmental regulatory systems are often embodied in Supplier Codes of Conducts or monitoring schemes, specifying the measurements and norms under which they evaluate their sustainability performance. For instance, many large companies joined The Sustainable Clothing Action Plan (SCAP) which was launched by WRAP in 2012 to provide a collaborative voluntary framework for fashion companies to reduce their carbon, water, and waste impacts ([Wrap 2019](#)) ([UK Parliament 2019](#)). Other companies voluntarily and publicly offer consumers insights into their supply chains. The German clothing brand IceBreaker, allows customers to trace the merino wool in the garment all the way back to the source ([United Nations 2017](#)). C&A Foundation is meanwhile collaborating with blockchain specialists to enhance the traceability of their

clothes. Also in terms of CE, brands such as H&M ran voluntary collection schemes in their stores to become frontrunners in recycling ([Knapp 2019](#)). Many voluntary initiatives, such as H&M's recycling scheme, however, have been subject to heavy criticism for 'greenwashing' as the company has made headlines for burning unsold or returned clothes ([Segran 2019](#)). Despite negative news coverage however, H&M has been growing and continuously opening new shops over the last years ([Farmbrough 2018](#)). This is an illustration of the fact that conscious consumer groups can still be considered niche consumers whilst the 'fast fashion' trend prevails as mainstream. This impression goes hand in hand with the Pulse of Fashion Industry Report (2017) in which CEO-level industry representatives name low willingness to pay by consumers for sustainability premiums as well as missing regulations and policies as main barriers to implement more sustainable processes (Pulse of Fashion Industry Report, 2017).

Nevertheless, the popularity of sustainable textile fibres, such as organic cotton, flax, hemp, jute, sisal, abaca, and bamboo are on the rise. Renewable and biodegradable synthetic fibres manufactured from natural resources, such as polylactic acid and lyocell, are increasingly preferred over petroleum-based non-biodegradable synthetic fibres, such as polyester ([Technavio Research 2017](#)).

The new textiles economy strives for a combination of (1) phasing out substances of concern and micro fibre releases, (2) increasing clothing utilisation, (3) radically improving re-/upcycling, (4) making effective use of resources and (5) moving to renewable inputs (e.g. renewably sourced feedstocks for fibres).

The CE approach is another emerging sustainability trend to relieve the pressure on resources in the textile industry and other sectors alike. It follows the '4R' logic of Re-design, Reduce, Reuse, and Recycle and refers to a design process that aims for enhanced durability achieved by enabling remanufacturing, disassembly and recycling, as well as applying cleaner production principles. In textile manufacturing, factors that allow cleaner production or circular textiles are highly related to the choice of fibres. Depending on the characteristics of either synthetic or natural fibres, a textile product is more or less durable or recyclable ([Hemkhaus et al. 2018](#)). According to the Ellen MacArthur Foundation, a frontrunner in research regarding CE, reuse of a product is more favourable than recycling, as the latter at the current technological level still often leads to a products loss of value or 'downcycling' ([Ellen MacArthur Foundation 2017](#)). This is predominantly the case when natural fibres are recycled mechanically since the length of fibres, which is a crucial quality indicator of fabric, often gets shortened. In contrast, upcycling is a prominent and more favourable approach because it gives a new purpose to waste material which formerly had little value. China was among the first countries that included CE into their development strategy in 2002, followed by the approval of a CE Promotion Law in 2009, after which the principle was implemented at the core of the country's economy (Lieder and Rashid 2016). Japan, Korea and Singapore are additional countries that perform well in terms of implementing Reduce-Reuse-Recycle principles.

The extent to which CE principles have been implemented in emerging Asian economies, however varies and even more so in the context of textiles. Bangladesh, Malaysia and Thailand have for instance formally established material recovery mechanisms, supported by regulations but the implementation is weak. Cambodia, Indonesia and the Philippines have no formal legislative framework, but rely on well-functioning informal material recovery mechanisms (Visvanathan et al. 2007). Vietnam has established a national Strategy on Integrated Solid Waste Management which includes CE targets and visions for 2025 and 2050 (Ghisellini et al. 2016). In Malaysia, South Korea, Japan and China CE principles have been adopted into educational agendas (Trencher et al. 2014) (Ryan et al. 2010).

Developments to address environmental and safety/health impacts through innovations in process technologies and textile chemicals have fostered new and closer forms of cooperation between manufacturers, researchers and chemical suppliers over the last years. Low-water consuming (low float technologies) and even water-free production technologies (e.g. water free carbon dioxide-based dyeing, example DyeCoo, Netherlands) are being adopted by manufacturers in the textile segment as Best Available Technologies (BAT). Textile chemical suppliers are responding by aligning their textile chemical portfolios with the emerging positive and negative lists of chemicals, developing less- and low hazard

alternatives with reduced water usage and effluent discharge (e.g. salt-free dyeing solution which reduce the discharge of Total Dissolved Solids (TDS)) (Nallathambi and Venkateshwarapuram Rengaswami 2016) as well as guiding their customers in the effective use and management of these chemicals. Emerging manufacturing hubs (e.g. in Africa) have the opportunity to adapt and integrate such BAT from the start, addressing potential conflicts about resources (e.g. use of arable land for growing food crops or natural fibres, use of ground and surface water for industrial production or agricultural and domestic use) in order to avoid the mistakes made by established manufacturing hubs.

Industry 4.0 with new technologies and methods is another factor that has already begun to change and disrupt the traditional way of textile/apparel production and is likely to increase its impacts on the industry in the years to come. Digitization will shape how products are designed, how supply chains are managed, how and where production takes place, how logistics systems are automated and run, and how products are marketed, sold and delivered to the consumer ([ILO 2019b](#)). Combining new developments in automatization (e.g. robotic and additive manufacturing), material sourcing and material science, digitisation in value chains will have widespread implications on the textile and apparel industry. Especially those countries which presently rely on plentiful available human resources and low costs ([ILO 2018](#)) will be affected. Textile hubs like Bangladesh or Cambodia might incur job losses due to 'insourcing' to advanced economic countries or relocation to new emerging markets ([Centre for Policy Dialogue 2018](#)). Such automated production units have already started operations (e.g. Adidas Speedfactory) enabling greater decentralization and flexibility in global manufacturing. The Li & Fung Group with 15,000 suppliers in more than 50 countries, and about 8,000 customers in double the amount of countries managed to speed up the time required for a product to reach the consumer by several months. Till now, digital technologies in the industry have played the biggest role in offering personalized products and services to consumers ([ILO 2019b](#)).

Summary of key innovation and disruptors

- Growing niche markets for ethical consumerism demanding transparency and sustainability along the entire value chain creates pressure for business-as-usual scenarios
- Product customization technology, such as additive manufacturing, body scanners and computer-aided design (CAD),
- Computerised manufacturing processes, namely automated cutting machines and sewbots
- Development of new materials (such as synthetic and cellulosic fibres) and advances in wearable technology, such as nanotechnology
- New manufacturing techniques with lower environmental impact, for example through waterless processing (e.g. waterless dyeing and finishing processes) and water treatment and recycling towards closed loops (e.g. advanced water treatment and recovery, recovery of chemicals)
- Establishment of supportive systems (e.g. chemicals management information systems, traceability systems) ([Horotan and Mulvihil 2018](#)) and the development of safer textile chemicals (such as safer finishing chemicals and bio-based dyes)
- Advanced scope for fibre recycling (e.g. cotton, polyester, blends and nylon)

2.2 Leather sector

2.2.1 Market development

Like the textile sector, the leather sector has a long history. In order to stop the natural decomposition of animal skins and hides various methods of preserving emerged over time. Traditionally, vegetable extracts (tree bark) and minerals (aluminium salts) were used. Until the 19th century, there was little development in the tanning process. In 1858, chrome tanning was invented which quickly became the most common and dominant form of tanning, significantly reducing the time required to a few days.

By 2014, chrome tanning (using chromium III salts) accounted for around 85% of global leather production. 95% of shoe upper leather, 70% of leather upholstery (but decreasing in favour of Free-of-Chrome (FOC) leather) and almost 100% of clothing leather were chrome tanned. Initially, hexavalent chromium was used till its ban due to its adverse health impacts. Of late, leading brands responded to concerns about possible adverse impacts of chrome-tanned leather by moving towards fully and semi FOC leather. FOC leathers are now increasingly used in automotive upholstery and furniture upholstery. The production of FOC leather is more complex and associated with higher input costs per unit areas than that of the chrome-tanned leather and is, hence, mostly produced in developed countries ([UNIDO 2000](#)). Its main advantage is the absence of heavy metals, reduced issues with the disposal of solid waste and amelioration in dry-shrinking. The level of chemical oxygen demand (COD) in the effluent, however, is higher, the fixation of dyestuffs is diminished, and more chemicals per kg of raw hide are needed during the tanning process ([UNIDO 2010](#)). Research in alternative tanning as well as in advancing vegetable and synthetic methods is progressing. Even though many vegetable tanning agents occur naturally, they are not available in sufficient quantities to satisfy the demand for leather production worldwide. Sector experts have voiced the opinion that a replacement of chromium might not be feasible, but that a better management of chromium in tanneries might be the way to go ([UNIDO 2010](#)).

The leather supply chain can be divided into several stages: 1) the sourcing of raw material, i.e. animal skins and hides, their storage, and beamhouse operations (not considered in this study) 2) tanning, 3) post tanning, 4) finishing operations to convert animal skins into leather, and finally 5) the manufacturing of leather products (Memedovic and Mattila 2008). Originally, the tanning industry was dominantly characterized by small and medium sized (SME) family-owned businesses. With the relocation of labour-intensive leather manufacturing to countries with cheap labour pools, many tanneries followed. Tanning tended to be more lucrative where environmental standards were lacking, and costly waste and wastewater treatment could be neglected.

95% of raw materials used by the leather industry are by-products of the world's meat and dairy industry. This is split up into roughly 65% cow hides and skin, 15% sheep skin, 10% pig, and 9% goat skin as well as a small but growing share of skins from buffalo, camel, deer ostrich, yak and kangaroo ([Mahi 2019](#)). Environmental hazards caused by the leather industry have been a growing concern since the 1980s. Given its high adverse environmental impacts, especially on the utilization and degradation of land and water resources, the implementation of environmental protection measures by the leather industry has become a priority for the international leather community. Many European, Japanese and American tanneries have closed down and shifted/outsourced their production for example to Asia. The European tanneries that survived have either built lucrative international partnerships or found a niche in the leather market requiring high levels of creativity and quality, are highly efficient and have outstanding process and innovation skills ([UNIDO 2010](#)). While benefiting economically from the growth of a thriving industry, most leather producing countries outside of Europe and the US continue to struggle with the often traditional and polluting production facilities used by tanneries and bad waste disposal management. Despite the fact that major leather manufacturing countries such as China, India and Indonesia have recently become stricter in the enforcement of environmental protection laws and the management of waste and wastewater, critical levels of pollution in many manufacturing countries remain

to be a burning issue (Siddique 2013). Just like in the garment and textile sector, the leather value chain has gotten under the scrutiny of large brand manufacturers and global retailers who, in turn, are feeling the pressure of their consumers to offer sustainably produced products.

The global leather value chain starts with rearing livestock and ends with the manufacturing of leather products. In between lie the conversion of hides and skins from slaughtered animals to leather by tanning, and finally the production of final leather goods. Along this value chain, there are other industries that feed into the production stages, such as the chemical industry at the tanning stage, designers and marketing experts closer to the end of the value chain (Memedovic and Mattila 2008). Accordingly, when looking at trade in the leather sector, several stages of production have to be distinguished. Raw hides and skins, finished leather, as well as finished products are being traded globally. Taking the entire value chain into account, Europe (led by Italy and France) represent 35% of global exports. European skins, leather and leather products continue to be dominant in premium and luxury sectors where sophisticated know-how, high quality skins and the prestige of European fashion brands are essential. In 2018, the US was the biggest exporter of raw hides, whilst Italy is the largest global exporter of finished leathers primarily supplying China, which in turn is the largest importer of raw skins and hides and the largest exporter of finished leather goods (followed by Italy and France) ([Conseil National du Cuir 2019](#)).

Taking the entire leather value chain into account, Asia is the global leader in exports with a share of nearly 60%. Considering the footwear sector alone, 65% of its exports is accounted for by Asia, followed by Europe with a share of 30%. In Asia, China, Vietnam, Indonesia and India together hold a share of 52% (Conseil National du Cuir 2019). Whilst China continues to be the overall export leader, recently, increasing labour cost and tightening environmental regulation have decreased its market share by more than 10% since 2010 to the advantage of other Asian countries that are catching up thanks to cheap labour and high-quality products (Conseil National du Cuir 2019), such as Vietnam.

Traditionally, footwear has been the main product manufactured out of leather. In the 1990s, the automotive industries started to equip their cars with leather seats and became a major leather off-taker. In 2013, car leather accounted for about 10% of leather products. The use of leather in the footwear industry has been on the decline from 75% in 1950 to about 50% in 2013, but is expected to remain to hold a significant market share due to rising consumer preference for high quality and comfort footwear products ([Leather Dictionary 2019](#)). Relatively newer uses of leather can be found in clothing (15%), furniture (13%) and other leather goods (8%) (UNIDO 2000) ([Leather Dictionary 2019](#)). A growing demand for trendy premium leather wallets, handbags, and other leather goods is boosting the leather goods market. Today, fashion products in general and footwear products in particular are no longer mainly driven by the need for long durability – a quality provided by leather – but rather by the need to satisfy fast changing fashion trends. Leather's role in fashion nowadays is mainly rooted in the individuality and value that it offers as a natural product (Kral et al. 2014).

The overall global market for leather goods is likely to grow at around 6.2% during the period from 2018 to 2023. Availability of affordable high-quality leather goods and demand for durable luggage and footwear products is supporting the market growth in the Asia-Pacific region where China holds the largest share of each category of leather goods, i.e. leather footwear, luggage, accessories etc. which is derived from bovine animals, and light leather from sheep and goats. Key players in China are focusing on Bangladesh's leather and footwear market, seeking to draw investors and to increase the market share. Presently, China accounts for the worldwide third largest volume of leather footwear sales.

In several countries, the growth of the leather industry is supported through growing government support. In India, for instance, 100% Foreign Direct Investment (FDI) is permitted without prior government approval, excise duty was decreased, and so-called 'leather-parks' were established ([UNIDO 2010](#)). However, lack of raw material, competition from synthetic alternatives, trade restrictions and certification schemes are restraining the global market growth to some extent. The latter are for example the ISO 9000 certification regarding quality management, or REACH (Registration, Evaluation, Authorisation and restriction of Chemicals), a regulation for the chemical industry adopted by the EU in

order to protect human health and the environment as well as to make the industry more competitive (ECHA 2019). REACH replaces a number of European Directives and Regulations with a single system in which producers and importers have to ensure that their products and their production neither affect human health nor the environment adversely. Any producer or importer who would like to sell products in the EU needs to register all substances contained in his/her products and comply with REACH regulations (Pearson 2003).

Developments in the leather industry are closely interlinked with trends and prices in the livestock sector and the global demand for meat and dairy products (UNIDO 2010). The growth of the world population has been the main driver for a steady increase in the demand for meat and dairy products, enabling an increasing supply of animal skins to the leather industry. Recently, the demand for red meat, however, has slowed down in developed nations, whilst the increased demand for meat in Africa and Asia is generally met by pork and chicken meat. Nevertheless, the supply of hide and skin is forecasted to grow by about 3% per year. This development is accompanied by a shift of the origin of cow skins to developing countries where more than half of cow hides and skins are now coming from. This shift has raised new issues for the industry regarding inefficient farming practices, limited land availability as well as a general lower quality of raw material supplied (UNIDO 2010).

Artificial (also called synthetic) leather is a material intended to substitute leather in upholstery, clothing, footwear, and other uses where a leather-like finish is desired, but the actual material is cost-prohibitive or unsuitable. In 2017, the global synthetic leather market size was valued at USD 25.61 billion projected to expand at a CAGR of 7.4% during period until 2025, mostly driven by the globally increasing demand from the footwear sector. The price of artificial leather footwear products is three times cheaper than that of actual leather. The furnishing industry is also expected to emerge as a major application area for synthetic leather, since it has become more affordable than animal hides. For car upholstery the lighter artificial leather also contributes to making vehicles lighter, an important driver for lowering fuel consumption. Most artificial leather is based on polyurethane (PU) and polyvinyl chloride (PVC). As artificial leather is dyed and finished in such a way that it looks similar to real leather, it has substituted genuine leather in clothing and furnishing industries. PU-based artificial leather possesses strong stress tolerance which makes it viable to use in boots, shoes, bags, luggage, gloves and other consumer goods. Emerging regional markets, such as China, India, Brazil, Malaysia, Thailand, and Vietnam are expected to play a major role in the synthetic leather product demand. Extensive usage of synthetic leather in the footwear industry in these and several other regional markets is also expected to contribute to the growth of global industry over the next few years

Figure 2: Relevance of leather processes in focus countries

	Country	Sourcing (hides and skins)	Tannery	Manufacturing	Consumption
South-East Asia	Bangladesh	Domestic + Imported	High	Medium	Export
	China	Domestic + Imported	High	High	Export + Domestic
	India	Domestic + Imported	High	High	Mostly Export
	Indonesia	Domestic + Imported	Medium-High	High	Mostly Export
	Mongolia	Domestic	High	Medium	Export + Domestic
	Pakistan	Mostly Domestic	High	High	Mostly Export
	Sri Lanka	Imported	Neglectable	High	Export + Domestic
Central Asia	Kazakhstan	Domestic	Low	Low	Export
	Kyrgyzstan	Domestic	Medium	Medium	Domestic
	Tajikistan	Domestic	Neglectable	Low	Domestic
	Turkemenistan	Domestic	Medium	Medium	Domestic
	Uzbekistan	Domestic	Medium	Medium-High	Export + Domestic

2.2.2 Sustainability concerns

Key sustainability concerns regarding the leather sector are firstly related to global livestock production; secondly, the leather industry itself has been cause for concern regarding environmental, health and safety issues.

Whereas this study does not include livestock production, the severe negative impacts that it induces in terms of GHG emissions, soil and water quality deterioration, deforestation, biodiversity loss, and animal welfare need to be mentioned at this point. According to the Food and Agriculture Organization (FAO), livestock production is responsible for 8% of global water use, 37% of anthropogenic emissions (and 55% of anthropogenic nitrous oxide emissions), 20% of pasture degradation, use of 33% of cropland to produce fodder and occupation of 70% of available cropland, 37% of pesticide use, 50% of antibiotics usage, and the conversion of 70% of deforested land to pastures (Steinfeld et al. 2006). Animal rights activists further denounce the inhumane treatment of animal rearing, transport and slaughter. However, the leather sector as such argues that it is a by-product industry of the meat industry. The value of a hide only constitutes a small value when compared to the animal's meat. A decline or increases in global meat consumption, nevertheless, will have an impact on the sourcing of skins and hides and correspondingly on the leather industry as such.

Besides environmental and climate degradation caused by livestock, the leather industry itself has been a concern from the environmental and health view. It consumes large amounts of water and applies chemicals in varying amounts along the production process. Employees in the leather sector are often exposed to chemicals without necessary safety equipment or precautions. The wastewater and treatment sludge produced by the leather industry is accordingly extremely dangerous for the environment and human health ([FAO 2003](#)). Especially in manufacturing countries, such as Bangladesh or Pakistan, wastewater and sludge are often released untreated to the environment ([Paul et al. 2013](#)). Apart from the large quantities of wastewater and treatment sludge, commonly categorised as hazardous waste, the leather production results in large quantities of solid waste. Per one ton of raw hide that is used as input, about 450 to 730 kg of solid waste is generated by tanneries (Memedovic and Mattila 2008).

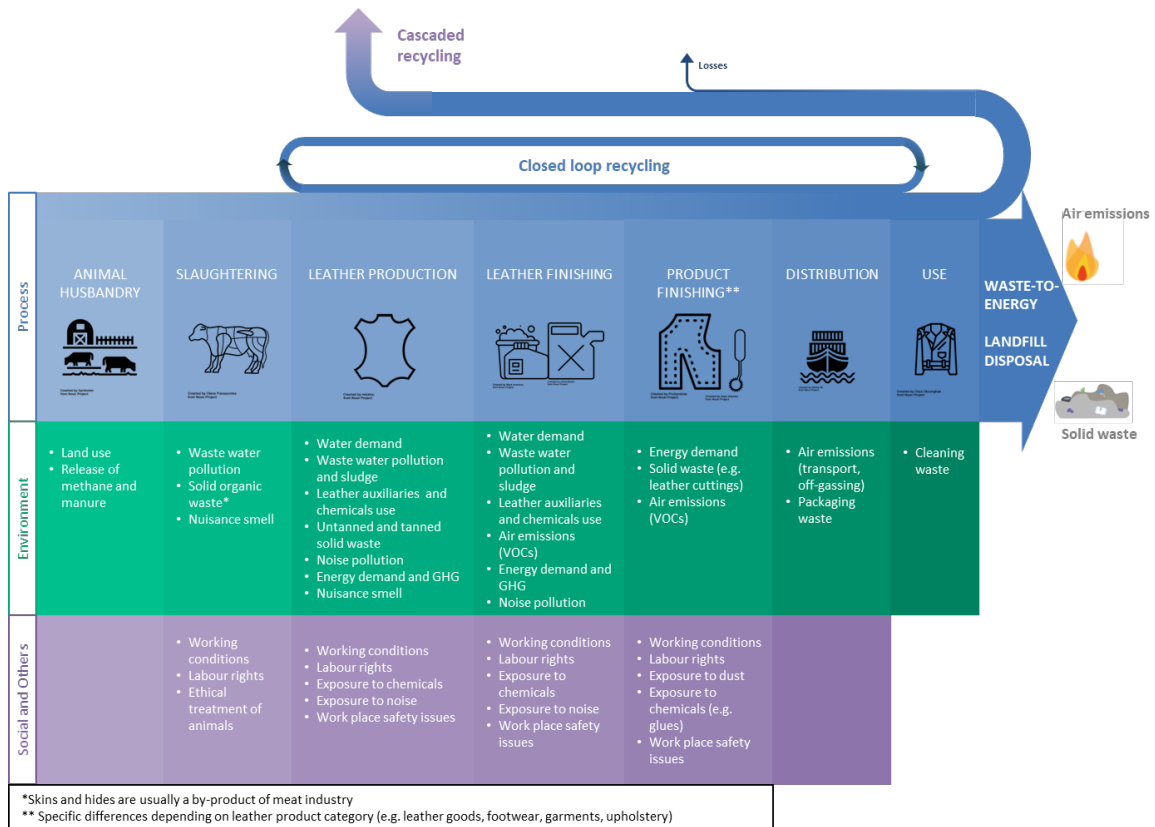
From a lifecycle perspective, another concern particularly related to chrome-tanned leather is the environmental fate of chromium used². When such leather products are being disposed of, the trivalent chromium might be converted into the hexavalent state which is extremely harmful to human health and the environment ([UNIDO 2000](#)). Responding to these concerns, leading fashion and footwear brands have reacted by assuring their consumers that their products are or will be chrome-free in near future. FOC labelled leather is tanned with tannins that do not contain trivalent chromium. In comparison to chrome-tanned leather, the production of FOC-leather is more complex and requires good process controls (such as exact temperature control of the tanning process). Other brands opt for shifting to the use of artificial leather.

Studies compare the functionality and environmental impacts of natural and artificial leather pointing to the fact that artificial leathers are not biodegradable and also detrimental for the environment, leaving a massive carbon footprint ([Staikos et al. 2006](#)); ([Pekhtasheva et al. 2011](#)). The production of many artificial leathers is based on PVC which requires plasticizer such as a phthalate (substance of concern) to make

² Since its invention in 1858 chrome tanning has become the (still) most common and dominant form of tanning (accounting for around 85 % of global leather production as per 2014). Chrome tanning is much faster than traditional vegetable tanning as well as less costly.

it flexible and soft. The production of PVC as such requires petroleum and large amounts of energy, thus making it reliant on fossil fuels. During the production process carcinogenic by-products, dioxins, are produced which are toxic to humans and animals. Dioxins remain in the environment long after PVC has been manufactured. When PVC ends up in a landfill it does not decompose and can release dangerous chemicals into the water and soil. However, also the research in artificial leather production technologies is progressing such as in term of bio-feed based polymers.

Figure 3: Issues along the leather value chain (adapted from Ellen McArthur F.)



2.2.3 Outlook and trends

The future of the leather sector will be driven by several factors: 1) competition to leather by synthetic fibres that will mainly dictate the price of products, such as shoes, that use leather, 3) technological changes 3) environmental and social issues and 4) economic considerations (UNIDO 2000).

As previously pointed out, leather as a material is facing growing competition from substitute materials. Leather-making technologies have not undergone many ground-breaking changes in the past centuries, but the adoption and absorption of new technologies has been slow. It is hence, not surprising that the R&D of new potential substitute materials have been pursued more rigorously than innovation in leather manufacturing in order to solve the environmental and economic concerns associated to today’s leather sector. As of now, there is no application of leather that could not possibly be replaced by another material. The increasing application of other materials also means that the prices of typical leather products (e.g. shoes) are no longer determined by the leather industry, but by leather alternatives. Stricter and better enforced environmental regulations further impact the economics of leather negatively; another factor pressing for innovations in the sector (UNIDO 2010).

Of late, the perception of leather has shifted from being an ‘eco-friendly’ and ‘natural’ product to one with an environmental footprint. Pressure groups challenging the leather sector on this front have arisen in several countries (UNIDO 2000). Despite the fact that animal skins are a by-product of the meat industry, the negative public image regarding social and environmental mismanagement in this area as well as growing public concern for animal welfare affect the industry and led to the launch of COTANCE and ETUF.TCL to improve the transparency and traceability of the origin of hides and skins (Euroleather 2009).

Increasing pressure on the environmental performance of the leather industry regarding the use of land, water and chemicals, as well as waste and wastewater management, the industry is looking at technology advancements similar to those achieved in the textile and faux leather sectors. This is especially true for the tanning sector that till date mainly relies on merely two rather ancient methods (chrome and vegetable) (UNIDO 2010). The Eurofins BLC Leather Technology Centre Ltd. in the UK concluded that *“producing ‘Eco-Leather’ could not be done by choosing the right tanning agent (chromium vegetable or mineral free) as each type has environmental impacts in different areas of their life cycle”*. The BLC rather suggested to manage the production process in a more sustainable way regarding the handling of waste, energy, water, chemicals and other factors in order to achieve a better environmental performance, e.g. through the implementation of BAT and Environmental Management Systems. Effort will go into making the process more efficient, reducing wastage and material loss, the avoidance of banned chemical inputs, and the handling of tannery by-products, such as collagen (UNIDO 2010). Following this spirit, the Leather Working Group (LWG) was founded in 2005 in order to develop an auditing protocol that rates leather products with regards to sustainability concerns in the supply chain. The objective of this multi-stakeholder group is to develop and maintain a protocol that assesses the environmental compliance and performance capabilities of leather manufacturers and promotes sustainable and appropriate environmental business practices within the leather industry. The LWG consists of member brands, retailers, product manufacturers, leather manufacturers, chemical suppliers and technical experts that have worked together to develop an environmental stewardship protocol specifically for the leather manufacturing industry. The LWG certification of the leather industry has become very important from an environmental and sustainability perspective in the international leather market. The increased need to comply with internationally recognized standards and certificates, such as the LWG certificate, OEKO-TEX or ZDHC, is a main driver for sustainable development in Asia’s leather sector that finds it increasingly difficult to sell products internationally without some kind of accreditation. This is demonstrated by the table below displaying the numbers of companies that already have achieved gold, silver or bronze ratings of the LWG certificate. This development, driven by multinational private actors in international supply chains, should be underpinned by national environmental legislations, penalty and incentive schemes.

Table 4: Leather Working Group (LWG) certified leather manufacturing industries in Southasian countries (Leather Working Group 2019)

Country	Rating	No. of LWG certified Companies
Bangladesh	Gold	1
India	Gold	69
	Silver	11
	Bronze	9
Indonesia	Gold	7
	Silver	01
Pakistan	Silver	01
	Bronze	01

As far as disruptive technologies are concerned, these evolve around approaches towards reducing water consumption, eliminating hazardous chemicals and reducing the pollution load from leather production. Regarding the use of water and land, zero liquid discharge (ZLD) and land saving concepts are likely to continue to catch on globally (UNIDO 2000). Also, microprocessors that can, for example, help monitoring the path of the leather from the birth of the animal to the finished end product might be something that the leather industry will adopt (UNIDO 2010). Considering recycling, so far chrome and energy have been recovered through incineration, or by partially decomposing leather in preparation for composting. Tanners have aimed at providing the highest level of collagen stability might now have to think of how to create unstable leathers in order to facilitate recycling of leather (UNIDO 2010). A Dutch tannery has recently developed organic leather that can be composted by replacing chemicals with biodegradable products.

2.3 Sustainable production aspects

In view of the potential adverse environmental impacts, textile (wet-processing) and tanning (manufacture of leather) are generally labelled as 'red category', i.e. most polluting industries, in the respective environmental regulations.

In the European context, those sectors are regulated under the Industrial Emission Directive (IED). For both sectors, the European IPPC Bureau (European Commission 2016) compiled comprehensive BAT Reference Documents (BREF), involving representatives from authorities, industry and other parties. India is the only country amongst those concerned in this study that is presently in the process of adopting the approach and compiling its own BAT Reference Document for the textile sector, with support from German partners such as the Umweltbundesamt (UBA, German Federal Environmental Protection Agency) and Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ).

While social standards (including safety & health aspects) have dominated the efforts by international brands as well as development partners, particularly at the garment and leather product manufacturing level, the focus has recently shifted towards environmental issues in textile wet-processing/finishing and leather manufacturing. Since the launch of Greenpeace' Detox campaign in 2011 (Greenpeace 2019), chemical management issues have become another priority issue in the context of international sustainable supply chain management. The campaign has resulted in a number of initiatives led by industry (e.g. Zero Discharge of Hazardous Substances (ZDHC) [ZDHC Roadmap to Zero 2019](#)) and bi/multilateral development partners (e.g. Partnership of Sustainable Textiles, Business Environment Performance Improvement – BEPI, IFC PACT). These joint initiatives have helped to start aligning the multitude of brand specific requirements (supplier code of conduct) as well as reducing the instances of parallel monitoring and auditing mechanisms. The specific performance requirements of these codes are usually based on the same international meta-standards (e.g. ILO standards, chemical conventions) or references (e.g. OECD Due Diligence Guidelines). The requirements do therefore generally not significantly differ from those required under the respective national regulatory framework. Due to the fact that the enforcement and governance structures in some countries are marred by challenges (e.g. limited capacities, corruption), brand-driven conformance requirements and pressure often act as substitute mechanisms replacing ineffective public enforcement authorities. Since the focus of the international brands is mostly confined to their direct and export-oriented suppliers, non-export-oriented units as well as sub-suppliers are at the risk of falling under the radar.

As far as sustainable sourcing of leather is concerned, the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) has an important influence on the type of skins and hides allowed to be processed and traded as it for example bans the use of endangered reptiles and

snakes. A CITES certificate/declaration has become essential for the successful delivery of leather goods; without a valid certificate the delivery is automatically returned to the sender.

The extent of vertical integration varies between the countries under purview. Cambodia, Laos and Myanmar³ mainly function as extended workbenches with focus on the production of ready-made garments for the export market. Bangladesh can rely on a domestic textile weaving and finishing sector to partly meet its demand of woven fabrics and knitwear for its ready-made garment sector, while the textile sectors in Pakistan and India can source cotton from within their own countries. In the Asian context as such and in the majority of countries in the study, China plays an important role, not only as the biggest manufacturer of textiles, but also as one of the largest investors. A good example to this regard is the thriving ready-made garment sector in Myanmar. Also, other countries are benefitting from the relocation and expansion of China's production (e.g. Bangladesh, Cambodia, Pakistan, and Vietnam). In the view of experts of GIZ SLSP, China may play a crucial role in advancing sustainable practices.

The differences in vertical integration also have a bearing and implication on the prevalent sustainable production issues.

1. The intensive use of process water (leading to a depletion of ground water) is reported as an issue in Bangladesh, India and Pakistan, competing with users in agriculture and households. Forecasts by the 2030 Water Resources Group paint a bleak picture for the water scenario in Bangladesh under a business-as-usual scenario, with the water consumption doubling between 2010 and 2030⁴. Certain textile clusters in and around Dhaka are expected to run out of water by 2025. Measures such as switching to surface water resources, applying water saving practices and technologies, as well as reuse/recycling of water are making in-roads in the textile sector at a larger-scale. Since water is not yet charged by volume in several countries, economic incentives to this regard are still amiss. Apart from that, no specific benchmarks are yet legally set or imposed for the sector. A few international brands already specify and communicate their maximum water use requirements to their suppliers.
2. Proper treatment of textile wastewater (as per national standards) is commonly required in all countries covered. However, in several countries these legal requirements are not adequately enforced leading to wide-spread pollution of water bodies and the soil resulting in economic hardship and adverse health impacts of workers and down-stream population. The availability of functional effluent treatment systems also constitutes a minimum requirement and pre-requisite by international brands for engaging into business relationships. Though the enforcement is expected to become more stringent over the coming years, SMEs face both financial and technical challenges to this regard. Dedicated common effluent treatment plants (CETPs) for SME clusters as well as indirect discharge to municipal treatment facilities where available, have proven as possible ways forward. In this context, the disposal of treatment sludge (a by-product of the wastewater treatment process) poses a general challenge, particularly when classified as hazardous waste. Only very few countries have specific binding regulations governing the disposal of treatment sludge or adequate infrastructure for treatment and final disposal in place.
3. Energy efficiency measures are commonly and readily embraced in the textile and garment-sector for their cost saving potentials, but also due to increasingly stringent climate change related regulations. Alternative sources of energy are also being explored, partly as an option of reducing energy costs

³ Myanmar is planning to expand and/or revive its former textile finishing capacities. According to information from the experts in the SMART Myanmar programme, the direction or extent of this development is not clear at this moment.

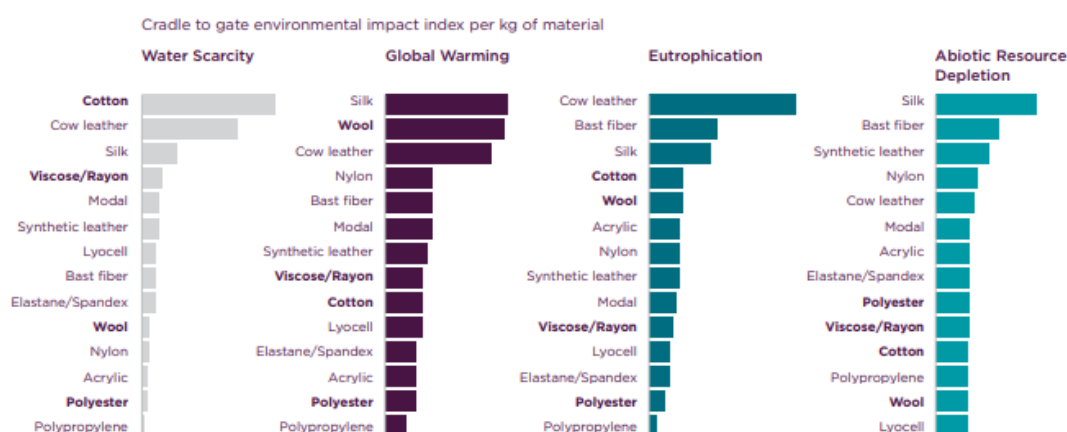
⁴ At present, 95% of the process water in the textile sector is drawn from ground water resources.

but also as a way of coping with energy shortages prevalent in many production hubs. However, coal and wood-based boilers are still quite common in SMEs contributing to a heavy load of CO₂ emissions.

4. The use and release of hazardous chemicals in and from several production stages (fibre/fabric production, wet and dry finishing) do not only contribute to the waste and wastewater problematic but also pose a considerable risk to the sector's workforce. While some countries, such as Vietnam, have established chemical regulations in line with international good practices, the use and disposal of chemicals remain largely unregulated in others. International initiatives (e.g. ZDHC, blue sign, Detox) work towards the elimination of specified hazardous chemicals from international supply chains. Being part of such international supply chains will require local producers as well as local chemical suppliers to actively get involved as well.
5. The environmental impacts of garment products during the use stage (e.g. gradual release of finishing chemicals such as perfluorinated compounds or micro plastics in laundering) and end-of-life/disposal stage are presently being considered in international supply chains only.

Global trends show an increasing relevance of speed, leading to small batch sizes and short product development calendars. Lower time to market enables to supply consumer demands of Western consumers quicker, which points towards a trend of automation and nearshoring of manufacturing processes (Andersson et al. 2018). The predominant offshoring model might not be able to compete with the emerging need for speed. Manufacturing technology is already able to automate on many levels of the supply chain, such as CAD in designing, automated cutting and sewing robotics. Such development could potentially have a disruptive effect on current suppliers, who might lose their former competitive advantages of lower wages. The target countries are therefore challenged to follow the example of China, to modernize and adapt to technological change (Lee 2018).

Figure 4: Environmental impact of selected textiles and leather (Boston Consulting Group 2017)



Note

- Water scarcity: Environmental damages of water use for human health, ecosystem quality, and resources. Prevalent in the raw materials and processing phases
- Global warming: Emissions of greenhouse gasses. Prevalent in processing and manufacturing phases
- Eutrophication: Excessive richness of nutrients in a lake or other body of water, frequently due to runoff from the land, causing dense growth of plant life and death of animal life from lack of oxygen. Prevalent in the raw materials phase
- Abiotic resources depletion: Depletion of natural resources faster than they can be replenished. Prevalent in raw materials and manufacturing (sundries and packaging)

2.4 Fashion and apparel consumption trends

Considering consumption in the global fashion industry, it is important to note that there are several, often opposing trends. The emergence of these trends differs amongst geographical regions and amongst consumer segments. As mentioned briefly before, the largest number of fast fashion consumers are amongst female millennials living in North America and Europe; however, fast fashion is on the rise in the growing middle classes of many Asian markets too. At the same time, consumers groups have emerged in the same markets, notably Europe and North America that demand more transparency and promote a more sustainable approach to overall consumption.

'Ethical' or 'sustainable fashion' first reached a noticeable market share in 2007, when its global retail sales reached an estimated USD 3 billion, the equivalent of about 1% of the overall apparel market (Pierre-Louis 2012). The Sustainable Fashion Blueprint 2018 report (by University of Cambridge MBA students Diane Albouy and Olabisi Adesida, British sustainable fashion marketplace Mamoo), ([Mamoo 2018](#)) reveals that UK consumers place sustainability as their fourth most important criteria when purchasing fashion (57%), after fit (84%), price (59%) and style (59%), followed by comfort (52%) and quality (52%). According to the report, the three main barriers preventing consumers from purchasing sustainably produced fashion were: (1) lack of knowledge and visibility of sustainable clothing, (2) the high price attached to sustainable fashion and (3) limited style. Customers appear to see sustainability merely as an add-on or nice-to-have. As per consumer surveys conducted by the Boston Consulting Group, today's consumers are already far more sensitive to environmental, social, and ethical concerns than those of previous decades. A third of millennials strongly agree that they are more likely to buy from companies that are mindful of their social responsibilities, while just a quarter of those older than 51 say so. However, only a tiny proportion of fashion shoppers are willing to pay a premium for sustainable products. Nevertheless, a survey by GlobalData carried out in 2019, concludes that 74% of 18-29 years old prefer to buy from sustainably conscious brands.

The 'sustainable fashion/apparel' (both including products based on textiles and leather) phenomenon has been subject of various academic and marketing studies. To date, however, there is no common definition of terms as illustrated by the selection of terms and their respective definitions in the table below.

Table 5: Overview of selected sustainable fashion/apparel definitions

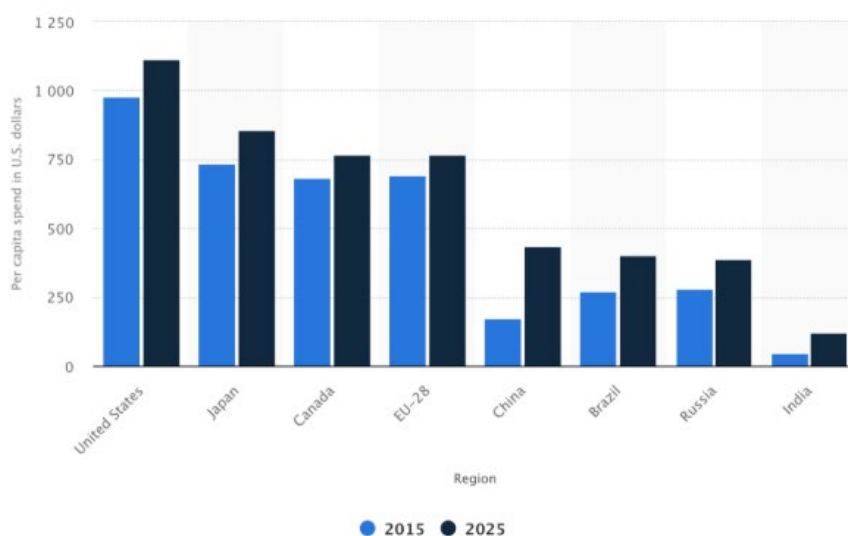
<i>Sustainable clothing</i>	Clothing which incorporates one or more aspects of social and environmental sustainability, such as Fair Trade manufacturing or fabric containing organically-grown raw material"	(Goworek et al. 2012)
<i>Ethical fashion</i>	Fashionable clothes that incorporate fair trade principles with sweatshop-free labour conditions while not harming the environment or workers by using biodegradable and organic cotton	(Joergens 2006)
<i>Eco-fashion</i>	Clothing that is designed for lifetime use; it is produced in an ethical system, perhaps even locally; it causes little or no environmental impact and it makes use of eco-labelled or recycled materials	(Niinimäki 2010)

Green fashion	The green [fashion] concept is related to the ecological dimension of sustainable development	(Lundblad and Davies 2016)
Sustainable fashion	Sustainable fashion encompasses the myriad of issues of an ethical or environmental nature in the production and consumption of fashion	(Lee et al. 2012)

‘Sustainable Fashion’ and similar terms incorporate various environmental and social aspects of sustainability. The environmental goals may for example include the terms ‘organic’, ‘biodegradable’, ‘eco-labelled’ and ‘recycled material’, or refer to the use of chemicals that minimize environmental hazards. Social goals may refer to terms such as ‘fair trade’, ‘sweatshop-free labour conditions’, and ‘locally produced’, or ‘made for long-term use’. ‘Sustainable fashion’ consumption could be defined as: *“a sub-set of the sustainable fashion system which includes consumer attitudes and behaviours that lead to reductions in the triple-bottom line (economic, environment and social) impacts of buying, wearing, caring for, repairing and recycling fashion goods. It includes demanding sustainable alternatives, caring for garments in less impact intensive ways (e.g. cold wash and line drying clothes) and responsible disposal or recycling of obsolete goods”* (Jackson 2014).

Though studies on ‘sustainable fashion’ consumption are available for the Asian region, their number is still limited and mostly cover markets in Asia’s leading economies. These studies usually build on consumer surveys (some with rather limited sample size) and focus on understanding the intentions that lie behind purchases of sustainably produced fashion and apparel (point of sales decision, consumers’ purchase preferences). While general fashion product value captures the attributes of a product that satisfy consumers’ general needs, green value refers to additional perceived utility aimed at meeting consumers’ environmental needs. For example, a fashion product made of organic cotton or chrome-free leather may protect the user’s body from allergies (functional value), and its appealing design would make the user feel good (emotional value). By purchasing a socially desirable product, the user may expect greater social approval (social value), and fulfil his/her desire to make a less harmful impact on the environment. According to the findings, sustainability aspects only play a low priority role, except for a very small group of fashion/apparel consumer segments. At the same time, there appears to be agreement in the studies that if more information was accessible to consumers, their consideration of sustainability aspects would increase, both with regard to production and consumption ([KPMG 2019](#)).

Trends in Asia show an expanding consumer class, especially China, followed by India and Indonesia. To fulfil the demands of these emerging consumer markets, competition over manufacturing capacities in Asian countries has increased (Lee 2018). By 2018 more than half of apparel and footwear sales originated outside of Europe and North America, according to McKinsey’s Global apparel and footwear sales forecast 2011-2025. While Europe and North America accounted for 60% in 2011, by 2025 the Western market’s share will drop to 45%. The Asian online apparel market alone is projected to reach USD 1.4 trillion by 2020 ([Business of Fashion and McKinsey 2018](#)). The demographic and economic developments in the new markets have led and lead to changes in consumer patterns, going through transformations comparable to those observable in the traditional consumer markets in Europe and the USA.

Figure 5: Country comparison of consumption power (Subramanian 2019)

On the one hand, these new and fast growing consumer groups increasingly pay attention to attributes other than price and design: consumer safety, quality, but also overall sustainability aspects are moving into their focus. This group of consumers are defined as the 'Lifestyles of Health and Sustainability' (LOHAS) market segment, a group related to sustainable living, 'green' ecological initiatives, and generally composed of a relatively upscale and well-educated population segment. In the US, LOHAS consumers now make up more than 25% of total consumers. On the other hand, 'fast fashion' has meanwhile also become a real phenomenon in many key Asian apparel markets. As mentioned earlier, volume of production (in terms of pieces of clothing) has doubled between 2000 and 2015, whilst the clothing utilisation rate has significantly dropped. What is noteworthy is that the drop in the utilisation rate is proportionally higher in emerging fashion markets such as in China with a 70% drop over the last 15 years. Embracing unsustainable consumption behaviours (such as consumers buying more, wearing the clothes less often and disposing them at unprecedented rate) as documented by EllenMac Arthur Foundation will add to the challenges at the end of the fashion product life cycles. According to research by Down2Earth ([Delaney 2013](#)) the following is the estimated time for some everyday items to decompose in landfill sites:

- Cotton 1 – 5 months
- Leather shoes 25 – 40 years
- Nylon based clothing 30 – 40 years
- Approaches will have to be adapted to specific cultural contexts and value systems

A study among Indian consumers (Ishaswini and Datta 2011) concluded that those who are highly involved and concerned with environmental issues prefer to buy eco-friendly products and are even willing to pay a higher price for them. This is also the finding of KPMG in their 2019 study on sustainable fashion (KPMG: Sustainable Fashion: A survey on global perspectives, Hong Kong, January 2019) according to which awareness of environmental issues is a concern for the vast majority of survey respondents globally. Sustainable fashion, it appears however, has yet to take a similar hold on their thinking and shopping habits when it comes to buying clothing, shoes and accessories.

Most consumers have, at best, only a vague idea about the social and environmental aspects of their purchases. While some might be attuned to fair-trade sourcing of the materials that go into a desired fashion product, they usually know little or nothing about the impact of the dyeing processes used in making the product. Similarly, they may also be unaware to their own contribution to the environmental impacts when quickly disposing of the apparel after only a few wears. Even consumers who want to

make informed decisions about their fashion purchases find it challenging to sort through the information that is available about the brands. According to the survey by KPMG (KPMG 2019), one area that might lead to more purchases of sustainably produced fashion is the provision of more information about how products are made, the sources of the materials and their impact on the environment at the end of their life. Consumers in all three of the Asian cities polled say that providing more information through labelling or a sustainability rating would encourage them to buy sustainably produced fashion. Eco-labelling schemes might trigger more 'green' purchase behaviour if consumers can trust the information provided. In India, for example, the government launched the eco-label 'Ecomark' in 1991 to increase consumer awareness and to facilitate the identification of green/environment-friendly products. Some Indian manufacturers, however, made green claims without actually offering green products. As a result, the Indian consumers, though environmentally more conscious and willing to buy green, remain sceptical whether products marketed as green actually have a better environmental performance as regular products (Modak and Roy 2014). To overcome this limitation, labels could be complemented by additional information about sustainability issues and the impact of eco-labels through appropriate media channels (Liu et al. 2012). Given the need of consumers to have as much information as possible about their purchases, also companies will have to take responsibility for how and under which conditions their products are produced and to communicate these aspects in a transparent way.

Besides making conscious choices about their fashion consumption patterns, consumers can most easily make a difference in their use of textile and leather apparel. By upgrading washing and drying machines to eco-efficient models, as old machines break, and by preferring air drying their clothes over the use of dryers they can save a great deal of water and energy. The use of ecological washing powders can help to reduce water pollution. They can also make a difference by extending the use of fashion products through repair and proper care. As for disposal, they can help by donating used garments and footwear through in-store collection boxes or public collection schemes. With education, information, and incentives, consumers can gradually change their habits far beyond washing and drying.

To advance a green consumer purchasing model, incentives and single issue labels (like the current energy rating label) would help consumers concentrate their limited efforts. More fundamentally, being 'green' needs time and space in peoples' lives that is not available in increasingly busy lifestyles (Young et al. 2009). Approaches will have to be adapted to specific cultural contexts and value systems. A study among Chinese consumers illustrates this (Wei and Jung 2017). It concluded that in China face-saving value can be a crucial factor in promoting the consumption of fashion that was produced sustainably. Marketers could emphasize face-saving-related benefits through advertising appeals, demonstrating that the product can boost consumers' decent image and present their good intentions in public.

Common factors inhibiting consumption of sustainably produced fashion include

- Perceived and actual higher cost/price of sustainably produced fashion and apparel in comparison to conventional fashion products
- General lack of awareness and interest in sustainability aspects regarding fashion and apparel by consumers
- Doubts whether fashion and apparel products that claim to be produced sustainably will perform as expected (durability, colour fastness)
- Limited and/or non-ready accessibility of fashion and apparel products that fulfil sustainability criteria
- Doubts about the quality of fashion and apparel that was produced sustainably (likely or actual impact or help the environment and social issues) due to instances of green washing
- Remaining environmental value-action gap between consumers' beliefs and fashion consumption behaviour
- Lack of local government policies that support sustainable production and consumption practices

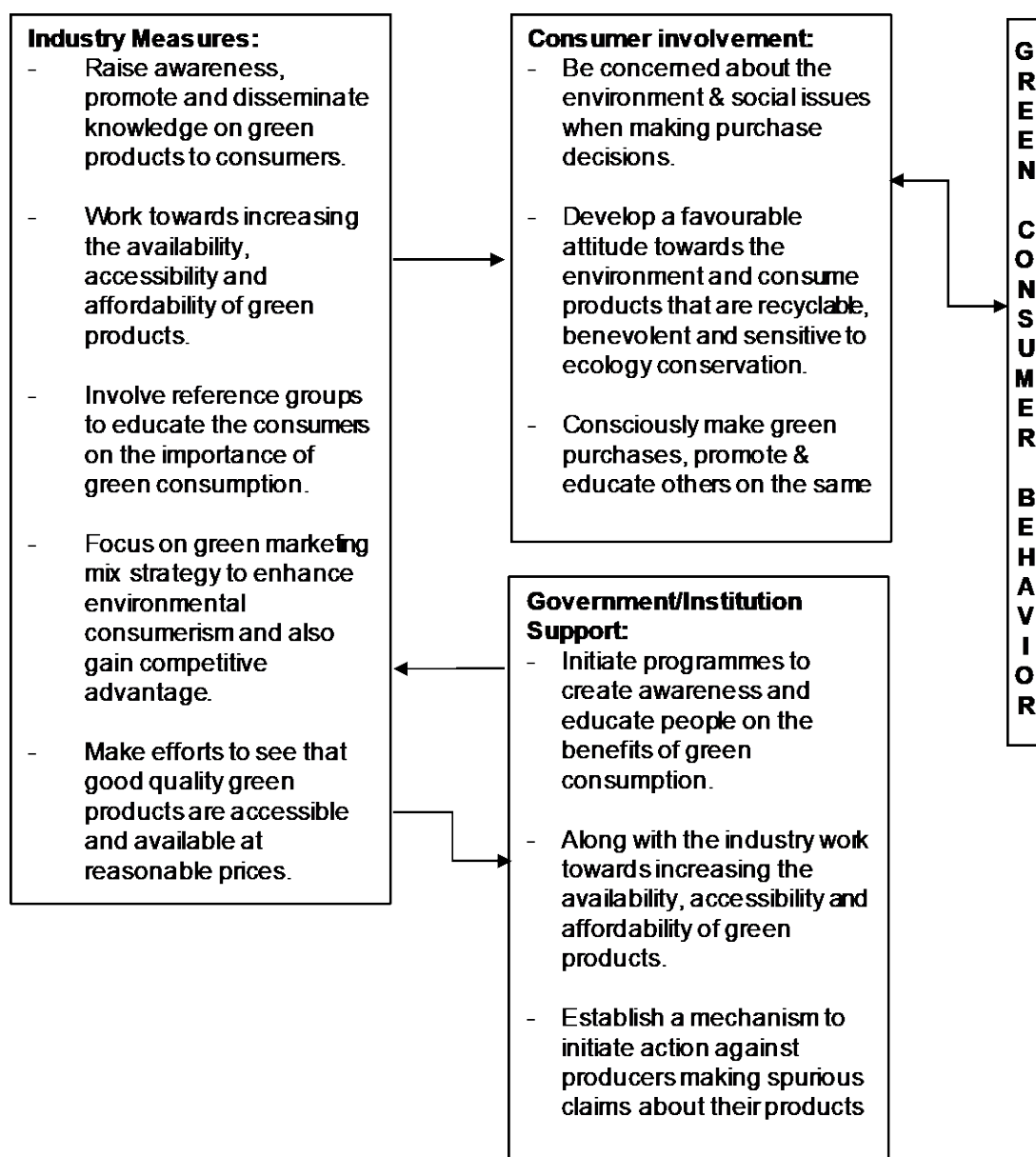


Figure 6: Possible roles and interactions of various stakeholder groups towards 'green' consumption (Nair and Maram 2015)

2.5 Regional SCP related initiatives in the sector

In each of the countries, initiatives addressing SCP aspects in the target sectors were, or are under implementation. Some examples are provided in the country-specific sections below.

With regard to corresponding sector-specific regional initiatives, the number is limited. These include the German government funded regional programme for Social and Labour Standards in the Textile and Garment Sector in Asia (GIZ 2018b), which is being executed by GIZ and covers Bangladesh, Cambodia, China, Myanmar, Pakistan and Vietnam. As part of this initiative, particularly the dialogue and knowledge exchange between different sector stakeholders on social and labour standard policies and practices

have been fostered. The regional activities are being aligned with the respective country-specific interventions and projects. The next phase of this regional programme, FABRIC, scheduled for the period 2019-2021, will extend its scope to environmental aspects as well. Its mandate specifically refers to SMEs.

FABRIC is closely linked to the goals and activities of the German-led Partnership for Sustainable Textiles ([Partnership for Sustainable Textiles 2019a](#)) commissioned by the German Federal Ministry for Economic Cooperation and Development (BMZ, Bundesministerium für Wirtschaftliche Zusammenarbeit und Kooperation). This multi-stakeholder initiative with about 130 members from the fields of economy, politics and the civil society was launched in October 2014 and strives to improve the conditions in the global textile production – from the production of raw goods for textile production to the disposal of textiles. Its members cover about half of the German textile market. The activities (see [Partnership for Sustainable Textiles 2019b](#)) currently cover Bangladesh, China, India and individual engagements (latter covering more manufacturing countries). As part of their individual engagements, the partnership's members focus on contributing to reducing the use of toxic chemicals, ensuring fair wages and working conditions and/or supporting farmers in switching to sustainable growing methods. Similar initiatives also exist in other countries such as the Netherlands (see Dutch Agreement on Sustainable Garments and Textile ([IMVO Convenanten 2019](#))), the OECD (see Responsible Supply Chains in the Garment and Footwear Sector www.oecd.org/industry/inv/mne/responsible-supply-chains-textile-garment-sector.htm), and the Partnership of Cleaner Textiles (PACT) by International Finance Corporation (IFC). Furthermore, various UN agencies and allied organisations have launched the United Nations Alliance for Sustainable Fashion (<https://unfashionalliance.org/>) in March 2019 to support the coordination between UN bodies working in fashion, and to promote projects and policies that work towards fashion value chains contributing to the achievement of the Sustainable Development Goals (SDGs).

Apart from the bilaterally and multilaterally supported initiatives, other initiatives led by individual brands, groups of industry or industry association are active in several of the target countries, for example Zero-Discharge of Hazardous Substances (ZDHC) ([ZDHC Roadmap to Zero 2019](#)), BSCI/BEPI by amfori (formerly EU Foreign Trade Association ([Amfori 2019](#)), Textile Exchange ([Textile Exchange 2019](#))), Sustainable Apparel Coalition ([Sustainable Apparel Coalition 2018](#)) to name a few (see short description below).

Short profiles of selected initiatives

- The ZDHC Foundation aims at eliminating the use of priority hazardous chemicals hereby taking a holistic approach to tackling the issue in the global textile, leather and footwear value chain. As of April 2019, the foundation brings together 28 signatory brands, 81 value chain affiliates, and 17 associates, representing brands, chemical suppliers and local manufacturers, service providers as well as NGOs. The activities under the foundation extend to all countries under the study.
- Under its strategy Vision 2030, amfori wants to enable organisations to enhance human prosperity, use natural resources responsibly, drive open trade globally, and ultimately contribute to the fulfilment of the SDGs. amfori is expanding its engagement with the textile and ready-made garment sector, having been present and working on the promotion of social and environmental performance in Bangladesh, Pakistan, Vietnam and Myanmar. Under its previous name, EU Foreign Trade Association (EU FTA) the organisation launched the Business Social Compliance Initiative (BSCI), later complemented by the Business Environment Performance Initiative (BEPI). The sector focus of these two initiatives goes beyond the textile sector though textile constitutes a major thrust area.
- The Sustainable Apparel Coalition (SAC) considers itself as the apparel, footwear, and textile

industry's leading alliance for sustainable production. It is active in all apparel, footwear, and textile manufacturing hubs in the region. Apart from industry representatives (both brands and producers), the coalition also brings academia, NGOs, and government members on board to jointly develop concept, tools and benchmarks.

- The Textile Exchange is a non-for-profit organisation, bringing together representatives from brand, industry, with the goal to drive industry transformation in preferred fibres, integrity and standards and responsible supply networks. Apart from extending advisory and training services to its member and stakeholders in the international supply chains, the organisation arranges for an annual global Textile Sustainability Conference which brings together a global community across the industry to exchange and plan on sector specific sustainability issues

With regard to the leather sector, the United Nations Industrial Development Organization (UNIDO) has established and moderates the Leather and Leather Products Industry Panel ([Leather Panel 2018](#)). This platform acts as the UNIDO global forum for technical assistance programmes dealing with the leather-based industry sector, providing information on good practices in small-scale manufacturing as well as professional training and pollution control procedures in the leather, footwear and leather products industries. The panel also functions as a gateway to various e-learning programmes on sector-specific environment and safety related subjects.

As mentioned earlier, the LWG ([Leather Working Group 2016](#)) is a multi-stakeholder group, made up of member brands, retailers, product manufacturers, leather manufacturers, chemical suppliers and technical experts that have worked together to develop an environmental stewardship protocol specifically for the leather manufacturing industry. The aim is to promote improvement in the leather manufacturing industry by creating alignment on environmental priorities and by bringing visibility to best practices and by providing guidelines for continual improvement. The member base also includes leather manufacturers from Bangladesh, India, Pakistan and Vietnam.

As part of the Global Network for Resource Efficient and Cleaner Production ([Network for Resource Efficient and Cleaner Production 2019](#)) convened by UNIDO and the UN Environment Programme (UNEP), the network partners' also implement a number of initiatives to the benefit of the target sector. The main objective is to contribute to an effective and efficient development, application, adaptation, scaling up and mainstreaming of Resource Efficient and Cleaner Production (RECP) concepts, methods, policies, practices and technologies in developing and transitioning economies. The main activities include support of ground-level improvements, knowledge-sharing and providing a dialog platform as well as capacity building support on RECP-related experiences and topics. For this purpose, the network brings together leading RECP service providers on a global and regional level, presently consisting of 70 members, covering 60 countries around the world. In line with its global networking character, RECPnet also aims to facilitate inter-regional and South-South cooperation with regard to the transfer of RECP-relevant knowledge, experiences and technologies. In the Asia region, members include National Cleaner Production Centres (NCPC) in India, Laos, Pakistan, Sri Lanka, Vietnam and several other organisations.

With regard to SPP/GPP and Eco-labelling in general, several initiatives have been launched, notable ASEAN 3, Sustainable Public Procurement and Ecolabelling (SPPEL) ([UN Environment 2017](#)) (in Asia: Sri Lanka, Mongolia, India, Vietnam.) An Overview of common textile and leather sector eco-labels and initiatives can be found in Annex 2.

The SCP Facility itself has supported a dialogue process among stakeholders in 2014, apart from acting as a knowledge repository for SCP-related experiences and facilitating regular exchange between stakeholders in the participating countries. At this moment, textile and leather products do not fall under purview of the GPP/SPP initiatives analysed in the target countries, however are subject of eco-labels (see Ekolabel Indonesia) or general procurement policies (e.g. MSME procurement policy).

In addition, the Asia-Europe Foundation, located in Singapore ([Asia-Europe Foundation 2019](#)) organises the Asia-Europe Environment Forum (ENVforum) ([Asia-Europe Foundation 2018](#)) which amongst others involves high-level dialogues international meetings, roundtables, conferences and workshops on sustainability related topics. As part of the Asia-Europe Foundation (ASEF), the Regional Asia Environment Conference Support Programme is jointly administered by Stockholm Environment Institute (SEI), Hanns Seidel Foundation (HSF), ASEM SMEs Eco-Innovation Center (ASEIC) and the Institute for Global Environmental Strategies (IGES).

3 Country profiles: Southeast Asia

3.1 Bangladesh

3.1.1 Sectoral profiles

3.1.1.1 Textile and RMG sector

The textile and garment industry in Bangladesh has been a major contributor to the country's economic development. In 1972, the gross domestic product (GDP) of Bangladesh was approximately USD 6.29 billion (Latifee 2016) and grew to USD 173.82 billion in 2014. Out of that, USD 31.2 billion were generated by exports; 82% of these exports came from the ready-made garment (RMG) industry. As of 2018, Bangladesh holds the second place in producing garments just after China. Most of the production is controlled by local investors; merely 5% of all textile factories are owned by foreign investors.

In the financial year of 2016/17, the RMG industry generated USD 28.14 billion, constituting 80.7% of total export earnings and 12.36% of GDP. Bangladesh currently has 425 spinning mills, 796 textile weaving mills, 240 dyeing and finishing mills, and around 6,502 registered and 527 unregistered garment and textile factories. The sector provides employment to more than 5.5 million people, of which 80% are women (mainly in RMG). Apart from larger units, SMEs cater to the local market or function as specialised sub-supplier units. The sector includes around 370 spinning and 600 mills, providing combined employment to 480,000 people. The loom sector comprises of 1,060 power units (43,000 workers) and around 183,000 handloom units (small-scale units, with employment of around 1 million people, 50% women mostly in rural communities) and supplies a large portion of the fabric required by the local market. The knitting and knit dyeing factories in Bangladesh produce fabrics for export as well as local demand (an estimated 800 export oriented and 2000 local market units, employment around 60,000 persons). The dyeing and finishing sectors comprise of 320 units, employing around 32,000 people. The RMG segment accounts for over 5,000 units, providing employment to 3.6 million people of which 80% are women ([Fashion2 Apparel 2018](#)).

Following the Rana Plaza complex collapse in April 2013, killing more than 1,100 and injuring another 2,000 people, the enforcement of safety and building codes were tightened with nodal agencies such as the Department of Inspection for Factories and Establishments (DIFE), together with the International Labour Organization (ILO) at the forefront as part of a national initiative. International buyers combined their efforts under the ACCORD and ALLIANCE initiatives. After the discontinuation of the latter by end of 2018, DIFE is expected to continue these efforts.

The environmental performance within the sector largely varies. An increasing number of RMG units is able to obtain highest ratings in LEED certification, while the percentage of wet-processing units connected to functional effluent treatment plants is reported to be 70% ([Molla and Mirdha 2019](#)).

The average water consumption of a Washing, Dyeing & Finishing (WDF) factory in Bangladesh is estimated to be around 250 to 300 litres of water per kilogram of fabric produced. According to estimates, about 70% of the 1,700 WDF textile processing units that account for a considerable portion of water consumption and pollution are located in the Greater Dhaka area. Most of the process water consumed by these units is groundwater ([Sagris and Abbott 2015](#)).

Bangladeshi SMEs occupy a central role in the country's economy, accounting for 20 - 25% of GDP, 80% of industrial jobs and 25% of total labour force in the country. The SME Foundation identified 177

textile-related SME Clusters in 51 districts of Bangladesh. 22 were Knitwear & RMG clusters, 16 Fashion Rich Effects, Wear & Consumers Goods, and 13 Leather Making & Leather Goods clusters ([Abdin 2018](#); [Zobayr 2017](#); [Ullah et al. 2018](#))

3.1.1.2 Leather sector

Bangladesh has a fairly large livestock population of 24.3 million cattle and 32.7 million goats to support a strong and growing tanning industry, offering the sector a high potential for in-country value addition. Cow hides account for 56% of the production, goat skins for 30%. Buffalo skins or kangaroo hides imported from Australia are also common sources for leather products in Bangladesh. The country's leather sector presently employs approximately 558,000 people (Paul et al. 2013) (Ahmed and Chowdhury 2016). There are about 113 tanneries in Bangladesh producing approximately 180 million square feet of hides and skins per year. Around 95% of tanneries were originally situated in the Hazaribagh cluster, located in the western part of the capital city of Dhaka. Constituting the only tannery cluster in the country, Hazaribagh had approximately 196 tannery industries in an area of 70 acres (0.283 km²) producing about 18,000 litres of wastewater and 115 tons of solid waste during peak time, and 75 tons during off-peak time. None of these tanneries were connected to an effluent treatment plant (Siddique et al 2005). The Department of Environment (DoE) of Bangladesh has categorized this area as a red zone due to high levels of soil, water and air pollution that pose a severe health risk to workers and people in general. Plans for relocating the cluster out of Dhaka into an industrial estate with adequate facilities for waste and wastewater treatment were made as early as 1990. Only in April 2017 however, the actual relocation of the tanneries to a newly built industrial complex for the tanning industry in Savar started to move forward. By mid of 2019, the inadequate and/or malfunctioning waste treatment facilities as well as the inadequate management of waste and odour at the new location have led to wide-spread protests by the neighbouring and downstream communities.

Most international buyers require tanneries to be LWG certified. Since Bangladesh's tanneries have not been able to meet these standards, most international buyers source their leather elsewhere. Sometimes, leather from uncertified origin in Bangladesh still makes its way to EU markets, for example via a detour through Thailand or China where the leather is processed into consumer goods (Siddique 2019).

Besides its tanning industry, Bangladesh has a growing number of footwear and leather products industries fuelled by domestic and FDI. High hopes for a steady supply of sustainably produced local leather to boost exports of leather products from Bangladesh had been pinned to the final relocation of the tanneries to Savar. As per information from the Ministry of Industry, the establishment of up to four more economic zones dedicated to the manufacturing of leather and leather products are planned.

3.1.2 Consumer profile

75% of the Bangladeshi population lives in rural areas. Most rural households spend at least half of their monthly income on food. Cereals, edible oil, vegetables, spices, clothing and fuel are usually considered as necessities, while eggs, fish, meat, sugar, milk and dairy products, education, and medical care are considered luxuries. It is noteworthy, that, even though the amount of clothes consumed increased, the amount of money spent thereon decreased. This phenomenon can be traced back to the cost efficiency in Bangladesh's clothing industry and the availability of low-cost garments. Societal expectations towards clothes have additionally contributed to higher clothing consumption particularly in urban areas, as traditional simple cotton cloth garments lose their level of public acceptance (Hossain 2010). In urban areas, new clothes can be bought from markets, but especially the urban poor get used clothes from relatives, landlords and employers or buy cheap clothes from second-hand markets and export surplus markets (Hossain 2005). So far, no systematic market studies have been conducted to assess the sustainable consumer behavior for fashion/apparels in Bangladesh.

3.1.3 SCP framework

SCP policy	<p>The 2018 Action Plan of the Ministry of Environment and Forest aligned the national development plans with the SDGs and aims at improving production practices, such as waste management, water treatment and sustainable resource use (Ministry of Environment and Forest Bangladesh 2018). An outlook on 2010-2021 in the National Sustainable Development Strategy by the Ministry of Environment and Forests reflected the SDGs 2030 Agenda and identified five priority areas and three cross-cutting areas presumed critical for achieving sustainability: 1) sustained economic growth, 2) development of priority sectors, 3) urban environment, 4) social security and protection, 5) environment, natural resource and disaster management. The following cross-cutting areas were further identified: 1) good governance, 2) human resource development and management, and 3) gender. Specific objectives regarding industrial pollution mention the goal to achieve ZLD and emission reductions in all industries by 2021 (Ministry of Environment and Forest Bangladesh 2008). These objectives are to be implemented through the Seventh Five Year Plan (FYP) (2016-2020) (Nagorik Committee 2006).</p> <p>In addition to the textile sector policy, developed by the Ministry of Textiles and Jute, the Ministry of Industry is in the process of developing a sectoral policy, which specifically refers to sustainability aspects and promotes the creation of at least three additional leather industrial parks to be developed along the principles of sustainable industrial areas.</p> <p>The current FYP specifically emphasises the need of sustainable production, notably in the textile and leather sector.</p>
SPP/GPP	<p>Neither the Public Procurement Act 2006 nor the Public Procurement Rule 2008 mention SPP or GPP with the exception of some stipulations regarding fair pay, occupational health, the prohibition of child labour and the necessity of environmental impact assessments for certain projects (Ministry of Planning Bangladesh 2006).</p>
Ecolabelling	<p>According to the Eco-label Index, there currently are six international eco-labels which are widely used in Bangladesh; however, none of those covers the leather, leather footwear or leather products sectors. An initiative to develop such a label was taken by the ECOLEBAN project under SWITCH Asia, but the label was never introduced to the market (Siddique 2019).</p>
Sustainable SMEs	<p>The Ministry of Industry offers support to SMEs in 11 sectors including knitwear, RMG and leather goods (2009). A study about SMEs in Bangladesh (2007) identified constraints for SMEs, such as lack of adequate investment, lack of modern technology, high interest rates on bank loans, irregular/inadequate supply of power, poor physical infrastructure and high transportation cost, poor information availability about market opportunities and requirements, inadequate availability of raw materials, lack of skilled technicians and workers, lack of research & development facilities, fierce competition, absence of effective and transparent legal system, difficulties in accessing technology, low access to business services, low awareness, low lobbying capacity, and rapid changes in the policy environment (Kashfia and Chowdhury 2009).</p>

3.1.4 Key SCP related initiatives

Presently, several partly overlapping bi-laterally and multilaterally supported initiatives are under implementation in Bangladesh that address SCP related aspects in the textile and RMG sectors. These include several GIZ executed projects under its Bangladesh GIZ Textile Cluster Programme, such as the (a) GIZ Programme for Promotion of Social and Environmental Standards (PSES) ([GIZ 2017a](#)) until 2020 (next phase is under preparation) which supports local RMG/textile industry associations in the development of sector-specific sustainable roadmaps and the adoption of shared responsibility approaches in addressing social, safety and environmental challenges, (b) Support of Safety Retrofits and Environmental Upgrades in the Bangladeshi Ready-Made Garment (RMG) Sector ([GIZ 2017b](#)) (SSREU, 2018 - 2020), (c) German-Bangladesh Higher Education Network for Sustainable ([GIZ 2018a](#)) (HEST, second phase 2019 - 2021) which aims at enhancing the quality and availability of educational opportunities.

The IFC extends textile sector-specific support through its Partnership for a Cleaner Textile Industry Pact (PACT) initiative ([Partnership for Cleaner Textile 2019](#)) currently in its second phase (2018 - 2020). PACT aims at contributing to the long-term competitiveness and environmental sustainability of the textile wet processing sector, by addressing high water, energy, and chemical use through the adoption of best practices in the textile sector. As part of these efforts, PACT has established the so-called Textile Sustainability Platform (TSP), a dialogue platform at the national level which is attached to the Bangladesh Garment Manufacturers and Exporters Association (BGMEA) to address issues pertaining to sustainable management of water, energy and chemicals. As part of a different initiative, IFC also supports the Bangladesh Economic Zone Authority ([Bangladesh Economic Zones 2019](#)) in integrating sustainable industrial areas concepts into the future development of industrial zones (including several ones dedicated to the textile and garment sector). In addition, IFC together with the World Bank, assisted the national partners in the development of an integrated sectoral development strategy for the leather sector (see ([Kathuria and Malouche 2016](#))). Leading industry associations, such as BGMEA ([BGMEA 2013](#)), Bangladesh Knitwear Manufacture and Export Association ([BKMEA 2019](#)) or the Leather goods And Footwear Manufacturers & Exporters Association of Bangladesh ([LFMEAB 2019](#)) in both the textile/RMG and leather sector are becoming more proactive in addressing sustainable development aspects among their members.

As early as the mid-90s, UNIDO extended assistance to the leather (tannery) sector in Bangladesh in addressing environmental and safety/health issues in the leather sector, particularly at its previous location in Hazaribagh/Dhaka. In the wake of the proposed relocation of the tanneries in Dhaka/Bangladesh, two more initiatives took place under EU-SWITCH RE-TIE ([Switch Asia 2012](#)), and ECOLEBAN ([Ecoleban 2017](#)) involving the local leather associations and international partners (sequa GmbH/Germany, UNIDO and subsequently Tecnalia/Spain). All these initiatives, addressing cleaner production, occupational safety and health, waste/water management as well as resource efficiency aspects, aimed at ensuring the incorporation of sustainable production aspects into the leather production process in course of the relocation of the tanneries to the newly constructed leather industrial complex at Savar. Due to delays in the actual shifting (which finally started in 2014) these efforts contributed to increasing general awareness about sustainable production among the sector players, though many of the concepts are yet to be realised at the new location. In the export-oriented leather product sector, the Leather goods and Footwear Manufacturers & Exporters Association of Bangladesh (LFMEAB) enforces its own code of conduct to ensure adherence of its members to common minimum standards on social, safety & health as well as, to a limited extent, environmental standards. Applications for LEED as well as LWG certification are under consideration.

3.2 Cambodia

3.2.1 Sectoral profile

3.2.1.1 RMG sector

The garment industry in Cambodia took off in 1993 with the onset of foreign investment. Since then, the sector has maintained its prominent position in the country's industrial landscape ([GMAC 2015a](#)). Till date, Cambodia's garment and textile industry is dominated by about 90% of foreign investments ([Clean Clothes Campaign 2015a](#)).

As of 2015, Cambodia is home to 699 textile and garment factories that employ around 650,000 workers, accounting for 77% of the total manufacturing sector (Lee 2018) and approximately 7% of the total workforce. Growth in the country's garment sector is driven by medium- to large-scale sewing factories. In 2014, there were 540 garment factories as compared to 48 in 1996 with a total export value of USD 5 billion (Garment Manufacturers Association, 2015). Together with the footwear sector, the garment industry accounts for about 80% of total export and foreign trade ([GMAC 2015a](#)) which is about 1.2% of the world market for garments ([Clean Clothes Campaign 2015a](#)).

The Cambodian economy is highly dependent on the RMG industry as it has little alternative economic foothold. The development of the RMG industry contributed extensively to poverty reduction offering unskilled workers access to the labour market. The majority of factories are owned by foreign companies, particularly by Taiwanese or Chinese investors. Only limited in-country down-stream supply chain links exist. The highest value-added activities remain in global buyers' hand, while cut-make-trim (CMT) processes, which are lowest-added activities, play a core role in Cambodia's textile/garment industry ([Hossain 2010](#)) ([Clean Clothes Campaign 2015a](#)).

The main environmental concerns caused by the industry include energy use and solid waste in RMG units. The country has formulated its own Green Growth roadmap (2009, 2013-2030) which highlights the importance of economic growth with limited environmental degradation.

Cambodia has seen remarkable improvements in labour standards in the garment and footwear industry according to ILO. The overall number of violations on 21 critical issues observed by the ILO fell from 811 in 2014 to 631 2018. However, not all areas have shown progress. While critical issues relating to such areas as emergency preparedness, discrimination, child labour and payment of wages and allowances have shown steady gains, other areas are stable or have even witnessed a decline in rates of compliance ([Xinhua 2018](#); [ILO 2002](#)).

3.2.2 Consumer profile

Around 46% of consumed goods of a Cambodian household consist of food, followed by housing, transport, energy, health and finally clothing and footwear (2,9%) ([Worldbank 2010](#)). People of the Mekong plains area are vulnerable to natural catastrophes and show the highest poverty rate in the country ([CDRI 2014](#)).

In recent years, the Cambodian middle class has been growing rapidly. Fashion consumers' desire for fast fashion is increasing, but Cambodians are quality-sensitive at the same time about their consumed garments. The Sampot is a traditionally worn dress which is increasingly being replaced especially amongst Cambodia's younger generation who is thriving for rapidly changing western fashion trends ([Khonkaen University 2014a](#)). Especially in the capital of Phnom Penh, fast fashion retail brands have entered the scene.

Clothes are also frequently bought on second hand markets, from street vendors and informal markets. Clothes sold on such markets generally come from Korea or Japan ([Khonkaen University 2014a](#)), ([Sekhani et al. 2019](#)).

3.2.3 SCP Framework

<p>SCP policy</p>	<p>After the introduction of the National Green Growth Roadmap in 2009, the National Policy on Green Growth took effect in 2013 providing a framework for the implementation of green growth principles in alignment with the SDGs. To achieve one of its main goals, the effective management of water resources, the Roadmap suggests the review of current policies, the promotion of green practices in the economy and the encouragement of innovating on green technology.</p> <p>A Green Growth Strategic Plan till 2030 (National Council of Green Growth 2013) further exists according to which several line ministries are mainstreaming green growth into their respective development planning (GGGI 2013).</p> <p>A Climate Change Strategic Plan for 2014-2023 formulated visions and goals considering the country's institutional capacity, climate change impacts and projections. Besides poverty reduction, priorities focus on the preservation of water resources, education on sustainable development, and equitable, gender sensitive, transparent, accountable and culturally appropriate climate change responses to be undertaken by civil society, the private sector and the government (National Climate Change Committee 2013).</p>
<p>SPP/GPP</p>	<p>The Green Growth Policy of 2013 aims at promoting green practices among ministries and governmental institutions (National Council of Green Growth 2013). The estimated value of public procurement is in the range of 20 to 30% of GDP.</p>
<p>Ecolabelling</p>	<p>The Institute of Standards of Cambodia (ISC) is the national standards body responsible for preparing and publishing standards and guidelines for products, commodities, materials, services, practices and operations in the country. As far as eco-labelling is concerned, some cooperation has taken place between the country and international eco-labelling issuers, including the EU, the International Centre for Trade and Sustainable Development, amongst others (2010). However, as of date, Cambodia does not have a national eco-labelling programme.</p> <p>Manufactures of products destined for export, exporters in the tourism, education and IT sectors have registered ecolabels from all over the world to access new markets. In the domestic market, however, there appears to be little interest in eco-labels at this point of time (Rajan R Gandhi 2014).</p>
<p>Sustainable SMEs</p>	<p>In 2009, there were about 36,000 SMEs in Cambodia. Domestic SMEs are often locked-in in their scale, as the regulatory burden in the country, as well as the slow adoption of technological innovation prevents them from upgrading. Limited access to finance is also a major difficulty for SMEs. In the context of garments, many SMEs are locked-in CMT processes, and are unable to take in other value-added processes. A large majority of MSMEs is not registered, nor part of the countries tax system (Ung and Hay 2011).</p>

3.2.4 Key SCP related initiatives

With regard to policy action, the Cambodian government has shown efforts to join ministries in order to bring an action plan towards a greener economy on its way. In 2009, a Green Growth inter-ministerial working group published the National Green Growth Roadmap. The Roadmap aims to conserve and restore the natural capital base and to continue economic growth within the limits posed by the environmental carrying capacity ([Ministry of Environment 2009](#)). A National Green Growth Secretariat (NGGS) & Inter-Ministerial Working Group on Green Growth (IWGGG) were established after Cambodia approved the national policy and the strategic plan for green growth in 2013 to coordinate with relevant ministries, agencies, institutions, organizations, enterprises and civil society ([GGGI 2013](#)).

Based on this roadmap, the government requested the Global Green Growth Institute (GGGI) to further improve the country's sustainability performance. With its aim to catalyse an era of green growth in Cambodia, the Green Growth Program formulated a master plan tailored to specific characteristics of the country in accordance with the National Strategic Development Plan (NSDP) to target sectoral green growth as well as compatibility between industry development and environmental protection ([Lee 2012](#)).

Better Factories Cambodia was created in 2001 as a unique partnership between ILO and IFC and ever since has provided trainings for factory representatives, for instance on chemical management, fire safety, electrical safety, occupational health and safety ([Better Factories Cambodia 2018](#)).

Apart from governmental and international activities, also several multilateral initiatives have been implemented. A platform named Green Business Committee was initiated by EuroCham Cambodia, an organization established in 2011 with the objectives of promoting the interests of European businesses operating in Cambodia, facilitating the entry of European companies into the market. The platform was created for information sharing and discussion, and concerns itself with matters that solely relate to green industries while seeking to provide Cambodian authorities with relevant and constructive policy inputs as well as raising awareness for green business practices in Cambodia ([EUROCHAM Cambodia 2019](#)).

The Lab of Tomorrow is run on behalf of BMZ and in 2016 successfully organized the 'Lab 4 Sustainable Textiles Production in Cambodia'. Within this project, 33 participants from Cambodia and Europe with completely different professional profiles met up in Berlin to map out sustainable and interdisciplinary business-driven solutions for effective labour inspections in Cambodia. Challenges given were mainly rooted in projects by the GIZ 'Social and Labour Standards in the Textile and Garment Sector in Asia', the sector programme 'Sustainability in Textiles Supply Chains' and the 'Partnership for Sustainable Textiles'. In the further course of the project, five teams of participants generated ideas through an intensive process of collaboration using the design-thinking method ([Lab of tomorrow 2017](#)).

On a national non-governmental level, the Garment Manufacturers Association (GMAC), which represents the garment and footwear industries of Cambodia, runs a Health and Safety Smart Workplace Program. This program focuses on building management and employee knowledge about workplace safety and practices leading to improved health outcomes across several areas boosting both productivity and profitability ([GMAC 2015b](#)).

3.3 China

3.3.1 Sectoral profile

3.3.1.1 Textile and RMG sector

China has played a central and multifaceted role for the textile industry of entire Southeast and Central Asia since the beginning of the 20th century. Nowadays, it has the largest textile industry in terms of production and export worldwide and produces around 70% of the world's polyester (2015) and approximately 22% of cotton fibres (2019) (Textile World 2015) (United States Department of Agriculture 2019). In 2018, it exported textiles and apparel worth USD 276.73 billion which constitutes a new all-time record and a growth of 3% ([Asiantex 2019](#)). China further remains the biggest exporter of RMG: in 2017, it exported items worth USD 158 billion ([Textile Today 2018](#)). The Chinese RMG sector is characterised by industrial clusters which initially concentrated in China's eastern coastal provinces. Each cluster specialises in the manufacturing of one product or product group with a complete value chain of spinning, packaging, embossing, weaving, dyeing and finishing, stitching ready-made garments and washing all in one location ([EU SME Centre 2017](#)).

The textile industry represents a key sector in China's as well as the world's economy. Despite volatile general economic conditions from 2008 to 2011, the sector steadily increased its market share. Currently, China's textile industry is still growing, however, at with declining growth rates: from 2015 to 2014, it decreased by 6.4%. In most clothing product ranges, the formerly strong export rate has decreased over the past five years (Textile Today 2017). Caps on Chinese imports by some relevant European and North American markets have affected the industry in negative ways. At the same time, however, domestic markets have grown and a number of domestic brands have started to dominate the Chinese market, underpinning China's role as the number one provider of textiles and garments worldwide (Textile Today 2017).

Workers' wages in the Chinese textile and RMG industry have doubled and even tripled compared to wages 20 years ago (Hong Kong Trade Development Council 2019). The increasing costs of labour and raw materials have slowly been undermining the competitive advantage of the Chinese textile industry in the international market leading to increased Chinese FDI and therewith relocation of clothing manufacturing to neighbouring less developed Asian countries, such as Cambodia, Bangladesh and Myanmar where the country benefits from lower costs and preferential trade access (Zhang et al. 2015)(EU SME Centre 2017).

At the same time, high-tech manufacturing facilities are emerging in China's developed coastal regions to replace labour-intensive factories. As part of the new technology-driven focus, the country has been investing in the development of textile machines and now provides machinery and equipment for 80% of domestic demand. As Chinese manufacturers increasingly incorporate more value-adding processes along the value chain, several actors are trying to directly access the European market with their products either by building B2B relationships or by creating new brands targeted at the European B2C market, while maintaining production in Chinese factories (EU SME Centre 2017).

3.3.1.2 Silk sector

The silk sector in China used to be an important source of raw material for its textile and RMG production. In recent years, however, not many buyers have been willing to invest in the development of sericulture as other materials gained in relevance whilst cocoon prices have been unstable. At the same time, some of China's neighbours have established themselves as sourcing countries for silk. The

development of the Chinese sericulture industry is thus confronted with a shortage of funds necessary to innovate the sector's instable technical service system and outdated infrastructure (Gao 2011).

3.3.1.3 Cashmere sector

In 2014, an estimated 75% of the world's cashmere was processed in China. A significant part of the cashmere processed entered the country through cross-border trade and smuggling. The processing sector for cashmere is one of the very few light industries mainly based in western China (especially Inner Mongolia and Ningxia) due to the close proximity to cashmere supplying areas. Cashmere from China is usually produced by low-income herders in remote areas of Western China. The number of cashmere processors grew from ten in 1988 to between 2,000 and 2,600 in 2014. There are about five cashmere clusters; the biggest are located in Qinghe in Hebei Province and Tonxiang City in Zhejiang Province. The clusters consist of an intricate network of industry actors that operate on small-scale and divide as well as coordinate tasks (Waldron et al. 2014).

3.3.1.4 Leather sector

In 2013, there were more than 700 tanning factories in China, employing around 150,000 employees. The 700 million square meter which were produced that year accounted for a quarter of the world's total leather production. The tanning enterprises are mostly located in the regions of Hebei, Zhejiang, Shandong, Fujian, Guangdong and Henan.

In 2017, sales revenues generated by scaled leather and footwear companies increased by 3% compared to the previous year. The export of the leather and footwear industry was USD 78.7 billion, an increase by about 3% compared to the previous year. Leather goods and shoes are the most relevant product groups of the sector (China Leather Industry Association 2017). In 2017, 4.48 billion pairs of leather shoes were manufactured in Chinese factories (All China Leather Exhibition 2017). In 2015, almost 400 million pairs of shoes and over five billion pieces of luggage and bags manufactured in China were exported (China Leather 2016). The tannery and the manufacturing sector of finished goods also import leather for their production. 706,200 tons of semi-finished leather were imported in 2017.

3.3.2 Consumer profile

According to a McKinsey study, Greater China is expected to overtake the US as the largest fashion market in the world in 2019 (Business of Fashion and McKinsey 2018). China's population of 1.3 billion people constitutes a huge and growing potential market for RMG. Over half of China's population lives in urban areas. The country has experienced an astonishing growth of its economy, doubling its per capita income every five years (EU SME Centre 2017). This economic growth has translated into increased wealth of the population. Nowadays, a total of 69 million households have been classified as middle class; a number which is growing by 40 million people each year. 53 million households moreover belong to the middle-high class (EU SME Centre 2017).

Sales channels in the mainland have developed from formerly independent department stores, specialty stores and rural markets to multiple large-scale sales channels, ranging from shopping centres, supermarkets and chain stores, specialised garment markets, mail-order, TV and online sales (Hong Kong Trade Development Council 2019). In the Chinese textile and apparel industry, domestic brands continue to dominate the mass market, especially in lower-tier cities and in the rural areas (EU SME Centre 2017).

Products made in China are becoming increasingly popular and hence sold in China itself instead of being exported. In 2005, China exported 71% of finished apparel goods; by 2017, that share had dropped to 47%. Whilst this number is still high, a clear increase in the consumption power of China's

population is reflected in this drop. While in 2016 foreign brands still held a leadership position in the premium sector, a more recent survey by McKinsey suggested that up to three-quarters of Chinese consumers reported in 2019 to prefer local brands of apparel and footwear over foreign brands (Zipser et al. 2016) (Business of Fashion and McKinsey 2018). This shift in consumer preference promotes new opportunities for the Chinese textile market (Hong Kong Trade Development Council 2019).

The topic of sustainability is increasingly gaining in importance. In a comparison of consumers in different capitals, around 30% of participants from Shanghai said they were majorly concerned about the sustainability of fashion. Nine out of ten respondents in Shanghai saw themselves as supportive with regard to fashion and apparel sustainability. The use of resource-saving technology in production and biodegradable materials for both products and packaging have been found to be key elements of fashion and apparel sustainability as perceived in Shanghai. Worldwide, only 13 % of people say they are willing to pay more. Only 6% in Tokyo would pay a premium for sustainably produced fashion, compared to 22% in Shanghai amongst others due to different relevance given to sustainability attributes such as environmental friendliness and safety. From the study, Shanghai emerged as the city most aware and supportive of sustainably produced fashion. For Shanghai consumers, fashion sustainability is defined by high-quality, durable products, a production process free from hazardous chemicals and pollutants, the adoption of resource-saving technologies and techniques in production, low-impact care, and the use of recycled materials (KPMG China 2019).

Other studies including people outside the capital show that the Chinese public has a weak sense of eco-systems and environmental protection. Rural residents have an especially weak sense of ‘green consumption’ compared to their urban counterparts (Qiao and Wang 2011).

In general, Chinese consumers are aware of the basics of sustainable consumption, especially regarding food. According to a report of 2017 by the China Chain Store and Franchise Association who surveyed almost 10,000 consumers in ten Chinese cities, more than 70% of respondents agreed that “*personal consumption has a direct impact on the environment*” (Hall 2017). Young consumers in the age group of 20 to 29 seem to be particularly inclined to consume sustainably, whilst the actual purchasing power for sustainable consumption of the slightly older group between 30 and 49 year-olds in this regard is higher. The main drivers of sustainable consumption in China are safety and health, environmental protection and the reduction of overall costs whilst labour conditions, supply chains and animal rights, which are predominant sustainability concerns of US and European consumers (Hall 2017) appear to be of less importance. Half of Chinese consumers state to be willing to pay a premium of up to 10% for ‘sustainable products’. Nevertheless, China's market for ‘green products’ is currently not competitive, and is limited to niche consumers. Sustainability standards and labelling can be expected to be an effective measure to further deepen consumer awareness. The government has an important role to play in improving this situation (Li et al. 2017).

3.3.3 SCP framework

SCP policy

Chinese Environmental Law was tightened by the Chinese Government in 2015, following Premier Li Keqiang’s promise of a ‘war on pollution’. The strengthened Environmental Protection Law replaced former small and irregularly applied fines with higher penalties. Higher fines were assumed to make investments into new equipment for pollution prevention more economical, and business as usual practices less attractive for industries. The revised law (Tiezzi 2014) on environmental fines making the cost of non-compliance more severe even allowing for up to fifteen days of detention for company managers trying to avoid or intentionally circumvent regulations (Anderson 2017). Over USD 600 billion has since been pledged to mitigate air and water pollution, whilst investments in renewable energy – a nearly non-existent industry six years ago - have soared (Anderson 2017).

	<p>The government has been inaugurating the Green Manufacturing Association of China in 2017, and at the same time driving companies towards automation as part of the ambitious Made in China 2025 plan to modernise the country's factories. As a consequence, some factories have been shut down, often due to unwillingness or inability to afford the costs of new environmental requirements (Roxburg 2017)</p> <p>In 2018, additional revisions were made to further strengthen the environmental policy. The emissions discharge fee was replaced and tax proceeds were moved to the local government enabling them to set rates applicable to their conditions to promote compliance and to fund initiatives (SgT 2018).</p>
SPP/GPP	<p>A series of GPP laws were implemented as part of China's green procurement strategy between 2004 and 2007. These include three regulatory publications on Resource-saving Activities by the State Council Office, Government Procurement of Energy-saving Products and Government Procurement of Environmental Labelling Products.</p> <p>Since 2007, China has further passed various laws to promote GPP as part of the 11th Five Year Plan, including Energy Saving and Circular Economy Promotion Laws.</p> <p>The Circular Economy Promotion Law implemented in 2009 requires governments higher than county-level to establish a responsibility system promoting circular economy and to use government procurement power to promote circular economy. A green purchasing list is used as guidance tool and consists of two parts: the environment labelling product public purchasing list and the energy-saving product public purchasing list (Qiao and Wang 2011)</p>
Ecolabelling	<p>The work on establishing a Chinese eco-labelling program started in 1993, when the National Environmental Protection Agency (NEPA) issued a Circular Concerning the Establishment of the National Environmental Labelling Program (International Institute for Sustainable Development et al. 1996)</p> <p>A Certification Committee for Environmental Labelling Products (CCEL) was introduced and the program established in 1994. The scheme certifies products by a national certification institution (Qiao and Wang 2011) and fulfils the requirements of International Organization for Standardization (ISO) 14020 series standards.</p> <p>CCEL, authorized by the China State Bureau of Technology Supervision (CSBTS), consists of 24 members, of which 16 are governmental officials. To date, a series of working rules were adopted including Management Rules on Certification and Use of Environmental Labelling.</p> <p>In November 2006, the Finance Department and the National Environment Protection Administration announced The Implementation Guidelines for Environmental Symbols Products (Qiao and Wang 2011). According to these Guidelines, agencies that use government budgets need to give preference to environmentally labelled products and are not allowed to procure any products which might cause harm to either the environment or human health (Qiao and Wang 2011).</p> <p>The majority of national sustainability standards listed by the national Standardisation Administration of China (SAC) and other governmental agencies, together with Corporate Social Responsibility (CSR) guidelines, localised initiatives with reference to international public and private standards that can be classified as public voluntary standards. Even without legal obligation, plenty of these standards have been adopted by Chinese companies to improve product quality, enhance market competitiveness,</p>

	<p>and to serve as benchmarks for in-house standards.</p> <p>An Eco Mark for Leather was introduced in 2002 in order to enhance the environmental protection consciousness of the Chinese leather industry according to the China Leather Industry Association (China Leather 2013).</p>
<p>Sustainable SMEs</p>	<p>SMEs account for 98% of Chinese businesses providing jobs for the vast majority of the working population (Sommer 2017). In order to give preferential treatment to SMEs, the government has formulated several policies in regard to SME recognition, such as equal treatment, reserving shares, reviewing preferences, encouraging SME consortium, subcontracting, and training SMEs. Besides support policies, China provides specific credit guarantees, performance bonds, payment deadlines, and payment methods for SMEs (Wang et al. 2018). The credit guarantee system in place for SME finance is, however, still comparably poor and equity finance is often infeasible due to high stock market thresholds.</p> <p>The China Association of Small and Medium Enterprises (CASME) developed Guidelines to Small and Medium Enterprises on Corporate Social Responsibility in order to instruct SMEs on the government's four main categories of social responsibility, namely employment, environment, market and community as well as to promote the development of CSR.</p> <p>Due to rising government pressure and economic incentives, mainly to safeguard public reputation and to access global markets, SMEs increasingly adopt standards. However, the lack of awareness among entrepreneurs undermines the spread of standards, while high implementation and certification costs along with challenges in financing these investments and localisation of standards further hamper implementation. It further goes hand in hand with insufficient technical know-how and qualified personnel to adopt sustainability standards as well as a weak infrastructure of testing and certification facilities both at a regional and national level (Sommer 2017).</p>

3.3.4 Key SCP related initiatives

In order to promote sustainable consumption and green procurement, the Environmental Development Centre of the Environment Protection Administration has conducted several studies as well as organized conferences to encourage international cooperation and established the Chinese Green Purchasing Network (CGPN) ([Sommer 2017](#)).

Hong Kong-based textiles giant Esquel, who is the largest producer of shirts worldwide, has been actively engaged in initiating a dialogue to promote sustainable practices in the Chinese industry. The company set up a Sustainability Council of Esquel Group and organized an Integral Conversation sustainability conference in Guilin, where some of China's biggest names came together to outline their work in green production ([Roxburg 2017](#)).

A Green Manufacturing Alliance was established in 2017 in Beijing. It is committed to combine efforts of government, industry, universities and research institutes and jointly promote a green transformation of China's manufacturing industry and further to actively explore a new path of industrial green development ([Green Manufacturing Public Service Platform 2019](#)).

Yehyehyeh is an agency for fashion sustainability creating a dialogue around the topics of sustainability, creativity and innovation in order to instigate value-based change. For the Shanghai Fashion Week, it organized a forum titled "Can Fashion Be Sustainable?" ([Green Manufacturing Public Service Platform 2019](#)).

Kering, in collaboration with the global innovation platform, Plug and Play, held an event in 2018 in Beijing to launch the Kering Sustainable Innovation Award. The award aims to support sustainable innovation within the luxury and apparel sector in Greater China ([Kering 2018](#)).

The Institute of Public & Environmental Affairs (IPE) is a non-profit research organization based in Beijing and founded the Green Choice Alliance. This alliance is a coalition of Chinese NGOs that promote green practices in global supply chains by pushing large corporations to develop and improve the environmental performance of their suppliers ([Institute of Public & Environmental Affairs 2018](#)).

The Green Choice Alliance has already pushed nearly 2000 factories to implement corrective action through its Green Supply Chain project ([Anderson 2017](#)).

UNEP in collaboration with the International Trade Centre (ITC) and Research Institute for Global Value Chains (RIGVC) initiated a project called Building Capacities for Sustainable Textile Trade and Global Value Chains in Jiangsu in order to assess the development of sustainability practices in trade and production around the area of Jiangsu ([UN Environment and Trade Hub 2017](#)).

3.4 India

3.4.1 Sectoral profile

3.4.1.1 Leather sector

The leather sector holds a prominent place in the Indian and world economy accounting for 7% of the global leather production. It is known for its consistency in high export earnings and it is among the top ten foreign exchange earners of the country. The export of Indian footwear, leather and leather products reached a value of USD 5.74 billion in 2017/18. The Indian leather industry has access to an abundant flow of domestic raw materials as 20% of the world's cattle and buffalo population, as well as 11% of the global goat and sheep population have their home in India. Issues are caused by the fact that slaughter of cows is illegal resulting in illegal and unorganized slaughtering activities which in turn frequently lead to resentments with Hindu communities.

According to the Directorate General of Commercial Intelligence and Statistics (DGCI&S), Ministry of Commerce, Government of India, India's annual leather production is about 3 billion sq.ft, i.e. 10% of the world's leather demand. India is also the second largest producer and the second largest exporter of leather and leather garments which account for 9% of India's total leather sector exports. India is further the second largest footwear producer after China with an annual production of 2,257 million pairs. A large part of this production is sold to the Indian domestic market (around 2,021 million pairs sold annually). Footwear (leather and non-leather) exports account for about 43% of India's total leather and leather products exported. The main footwear, leather and leather products production centres are located in the states of Tamil Nadu (Chennai, Ambur, Ranipet, Vaniyambadi, Vellore, Pernambut, Tricky, Dindigul and Erode), West Bengal (Kolkata), Uttar Pradesh (Kanpur, Agra, Noida, Saharanpur), Maharashtra (Mumbai), Punjab (Jalandhar), Karnataka (Bengaluru), Telangana (Hyderabad), Haryana (Ambala, Gurgaon, Panchukla, Karnal, Faridabad), Delhi, Madhya Pradesh (Dewas), Kerala (Kozhikode and Ernakulam/Cochin), Rajasthan (Jaipur), and Jammu and Kashmir (Srinagar). Despite its size and importance, the industry is mostly unorganized and based on 90% of SMEs (Ministry of Textiles India 2019); (Pankaj and Lal 2019).

As of 2010, there have been 2,334 tannery units in India, which provide employment to around 2.5 million people. The leather industry as a whole offers employment to about 4.42 million people who mostly work uncontracted on a daily wage basis and often belong to lower castes. Women employment is predominant in the leather product manufacturing sector and accounts for about 30% of the labour force. Particularly the export-oriented leather product manufacturing sector has been closely monitored by international brands for compliance and conformance with social and labour standards.

Based on its large potential for growth and employment generation, the leather sector was identified as a focus sector under India's 'Make in India' government initiative and has been included in various Special Focus Initiatives ([Council for Leather Exports 2018](#)). The leather and footwear sector is further part of a government funded employment promotion scheme. The so-called Indian Footwear, Leather & Accessories Development Programme (IFLADP) has a budget of INR 26,000 million from 2017 to 2019 and it supports the expansion and modernization of production capacities of the Indian leather sector regarding environmental management in the tanning industry, the establishment of greenfield mega clusters, and human resource development. A green-field Mega Leather Cluster at Kothapatnam in Andhra Pradesh has already been approved, and another Mega Footwear & Accessories Cluster at IMT Sohna Haryana is currently at an advanced stage of construction.

3.4.2 Consumer profile

India's nominal expenditure growth of 12% is more than double the anticipated global rate of 5% and will make India the third-largest consumer market by 2025 ([Singhi et al. 2017](#)). The Indian middle class is growing and presents significant business opportunities for corporations. The sales growth of consumer goods to the middle class has already been established and new ranges of products are increasingly being geared towards this group ([Saxena 2010](#)).

A survey with 480 participants in 2008 identified a consumer segment among the Indian population which was environmentally conscious and had a positive perception of eco labels in the context of garments and wood products. The segment accounted for almost 20% of the sample and consisted mainly of post-graduate professionals or self-employed professionals from both genders. However, the majority of attitudes within the sample were not positive or even highly negative towards certification and conscious consumption ([Goswami 2008](#)). In contrast, Indian consumers are very conscious about organic agricultural practices for food production due to health concerns ([Paul and Rana 2012](#)). A majority of Indian consumers agreed in a survey that it is important that the products they use do not harm the environment, however, consumers are quickly convinced by green claims and are often unable to distinguish real intentions in green marketing from greenwashed promotions ([Bhatia and Jain 2013](#)). Considering social sustainability aspects, a study found that 71% of online consumers in India are willing to pay more for socially responsible products ([Goswami 2008](#)).

In the Indian context, collectivism and an understanding of the ecologically-related concepts are driving factors for green product consumption. It can be assumed that knowledge is a critical factor to increase sustainable consumption ([Danish and Naved 2016](#)). Indian consumers' buying aspirations are strongly group dominated and social acceptance is given high priority. The choice of products and brands is based upon family and group acceptance. Often Indian consumers prefer western brands as these connote luxury and status. The Indian consumer is associating western brands with status symbol, better quality of life and an enhancement of self-image. The young generation of consumers is considered a major segment receptive towards globalization trends ([Khare and Rakesh 2010](#)).

3.4.3 SCP Framework

SCP policy

The National Environment Policy of 2009, called for action in regard to general production practices by the corporate sector. Water and forest conservation, noise

pollution, as well as the introduction of Environmental Impact Assessments were identified as critical steps to take ([Cuts International 2009](#)).

The 12th FYP of India wants to establish an administrative structure that regulates safety, pollution, factory inspections, and labour conditions in the context of manufacturing. The issue of environmental sustainability as a cross-cutting issue among many industries should be given more attention according to the Plan. The Plan further promotes green businesses and the protection of natural resources, and addresses issues that constrain sustainable development. Key strategies include: the development of waste management and recycling programmes, supporting R&D for technologies in waste management and recycling and promote green entrepreneurship with funds ([Planning Commission 2013](#)).

The government has formulated several schemes for the benefit of the leather industry such as: the Tannery Modernization Scheme, the National Leather Development Program and the Leather Technology Mission ([Gombault and Begeer 2013](#)).

As part of the FYP 2012-17, the Ministry of Industry established a Leather and Leather Products Working group with a primary focus on the identification of environmental issues including those related to ZLD. One initiative included the establishment of a Footwear Design & Development Institute to provide training and consultancy about sustainability related topics to the local industry. However the Institute is only referring to economic aspects of sustainability (Working Group on Leather & Leather Products 2012).

As part of the 'Make in India' initiative launched in 2014, which devises to transform India into a global design and manufacturing hub, sustainability aspects are on the forefront. The industry itself propagates the same as well (Council for Leather Exports 2018).

Some standards for the Discharge of Effluents from Tannery industries were defined in the Environment Protection Amendment Rules, published in 2018 ([Ministry of Environment, Forest and Climate Change 2018](#)).

SPP/GPP

In India, approximately 20% to 30% of the GPD is spent on public procurement, and there are several ministries in which 50% of the total budget is spent on procurement. There is a growing need for less corrupt and more effective procurement systems. Various initiatives are currently aiming for a more transparent system ([Raymond 2008](#)).

In 2012, the Government of India approved the Public Procurement Bill to regulate government purchases above INR 50 Lakhs (USD\$ 80,000). In this context, Guidelines on Corporate Social Responsibility and Sustainability for Central Public Sector Enterprises (PSE) state that targeted companies for procurement need to ensure that not only themselves, but also suppliers, vendors, service providers, clients, and partners are committed to the same principles and standards of corporate social responsibility and sustainability. Moreover, public sector companies are encouraged to implement measures aimed at 'greening' the supply chain.

The National Voluntary Guidelines on Social, Environmental and Economic Responsibilities of Business from 2011 furthermore state that PSEs are to implement measures for waste management, re-use and recycling of waste materials to optimize energy usage efficiency throughout the organisation ([Mansi 2015](#)).

Ecolabelling	The Indian National Strategy for Standardization aims to build quality ensuring mechanisms and infrastructure in line with international standards. Eco-Mark India, established in 1991 by the Central Pollution Control Board, is applied to 15 product groups including textiles and leather (ENVIS 2017). This Eco-Mark marks products that are made, used or disposed of in a way that significantly reduces the adverse effects on the environment. An Earthen Pot is the logo of this scheme (Goswami 2008).
Sustainable SMEs	<p>The Micro, Small and Medium Enterprises Development Act of 2006 laid the groundwork for India's efforts to support SMEs (National Board for Micro, Small and Medium Enterprises 2006). Following this Act, the Ministry of Micro, Small and Medium Enterprises was established to implement the proclaimed targets. A Public Procurement Order from 2015 demands that 20% of goods and services procured by Central ministries are sourced from MSMEs, with particular attention given to the Ministry of Defence. Several programs have been initiated to promote sustainable practices such as in the area of design and by supporting the improvement of technology, skills, access to market and the building of infrastructure for further industrial development.</p> <p>The Integrated Processing Development Scheme has provided USD 61,42 million for a total of 3,000 SMEs in India, in order to equip them with modern technology for effluent treatment (KPMG International 2018).</p> <p>The 12th FYP has identified MSMEs as specifically high polluters requiring more attention and support to build infrastructure and upgrade technologies (Planning Commission 2013).</p>

3.4.4 Key SCP related initiatives

Since early 90s, UNIDO has closely worked with the leather sector and its associations in India. The initial efforts focused on cleaner production and wastewater treatment in the tannery sector in the South Indian state, Tamil Nadu. A landslide judgement by the Supreme Court in 1996 against polluting tanneries triggered a tightening of environmental enforcement and subsequent relocation of tanneries out of the Kolkata urban area to a new industrial estate. In further course, ZLD was enforced in Tamil Nadu given the precarious water supply situation. As part of the UNIDO RePO programme (Regional Programme for Pollution Control in the Tanning Industry), Occupational Safety and Health (OSH), gender as well as eco-labelling were taken up. Various initiatives, both by brands and the Council of Leather Exports (CLE), addressed social and safety/health performance in the leather product sector. Rising environmental management costs as well as competition in the labour market led to a consolidation in the tannery and leather product sector. Environmental, safety and health performance issues are yet to be uniformly addressed on an India-wide basis. Of late, organisations such as UNIDO and Solidaridad Network Asia have been supporting the leather sector in Kanpur, Uttar Pradesh as part of the Ganga Rejuvenation initiative (National Mission for Clean Ganga), particularly looking into enhanced water management, wastewater treatment, as well as safety and health with a special focus on SMEs.

The 1996 landmark judgement against the leather sector industry also triggered stricter enforcement in the textile sector. Similar to the leather sector, the textile sector in Tamil Nadu needs to comply with ZLD.

3.5 Indonesia

3.5.1 Sectoral profile

3.5.1.1 Leather sector

The Indonesian leather industry has been one of the country's biggest economic sectors that contributed to about 28% of national GDP from 2014 to 2017. This share has been even slightly increasing in 2018. Currently, Indonesia's leather, footwear and leather product exports rank sixth in the world, and show further great potential for development. According to the Ministry of Industry and Information Technology, Indonesia's exports in this sector reached USD 4.16 billion in September 2018, constituting an increase of 6.28% compared to 2017. The main importing countries of Indonesian leather products are the United States, Belgium, Japan and China ([Minsitry of Trade Indonesia 2018](#)).

The Indonesian leather/footwear sector production grew by 9.9% in 2017, as compared to 3.6% growth in the RMG sector, and even a fall in production in the textile sector of 2%. The leather (tanneries and footwear) sector experienced steady growth during the last eight years, with the number of medium- and large-scale units increasing from 708 to 738 units. At the same time, also the number of small units has significantly increased (from 6,200 to 12,690 units) in the time from 2010 to 2015 ([Bureau of Statistics Indonesia 2019](#)). The sector provides growing employment to around 310,000 workers (by 2016). 90% of all business units in the country are SMEs.

Environmental issues are often related to illegal waste disposal. In 2012 and 2013 locals of Medan and Magetan complained about waste of tanneries which was disposed in the environment and caused environmental problems in the areas (Gombault and Begeer 2013).

3.5.2 Consumer profile

Indonesia is a rapidly urbanizing country, fuelling a rise in incomes and increasing strongly in the numbers of consumers. It is expected, that up to 90 million Indonesians will join the ranks of the consuming class by 2030. Indonesia's economy relies heavily on domestic consumption compared to the neighbouring, largely export driven nations. This is because Indonesians strongly prefer and trust local brands. Despite being among the highest users of social networking sites in the world, online shopping still has low penetration rates due to mistrust of many consumers ([Razdan et al. 2014](#)). Indonesian consumers still prefer traditional bargaining markets with local products over modern markets with fixed prices.

As in other Asian Tiger countries, 'fast fashion' has made inroads, particularly in the urban areas. A YouGov Omnibus research in 2017 (7,439 respondents in Indonesia) revealed that two thirds of Indonesian adults (66%) have thrown clothes away at some point in the past year and a quarter (25%) have even thrown away more than ten items. Furthermore, three in ten (29%) have thrown away an item of clothing after wearing it just once and, in the past year alone, 15% had thrown away at least three items that they had only worn once. Millennials (those aged between 16 and 34) have the highest proportion of new clothing having purchased at least half of the clothes that they own in the past 12 months.

A study that observed students from different universities showed that higher income of Indonesian consumers points towards stronger 'green' consumer beliefs. The wealthier group of the sample tended to buy less packaged products, and to prefer products from local stores, to buy high efficiency bulbs, and to have a more energy efficient household compared to the less wealthy group. According to the study, challenges in the way of 'green' consumption are higher prices, lower quality and a lack of information. There is a strong perception in the society that 'green' products are generally more

expensive than regular ones. Further it is believed among participants of the study that the government is most responsible to facilitate change in that regard ([Panjaitan and Sutapa 2010](#)).

Initiatives supporting eco-friendly fashion and promoting sustainability in the industry, such as by the Association of Indonesian Fashion Designers and Entrepreneurs (APPMI) showcasing eco-friendly collections during the Indonesia Fashion Week 2019 are pointers that 'slow fashion' and fashion/apparel sustainability may start establishing itself in the Indonesian market as well.

3.5.3 SCP Framework

<p>SCP policy</p>	<p>The establishment of a social and environmental governance structure was started in 2009 and has since then implemented several regulations containing some SCP aspects. Since 2015 targets towards SCP have been specified (FAO 2009). A law regarding the development of 'green' industries, places priority on efficiency and effectiveness in the sustainable use of resources, harmonization between industrial development and the preservation of environmental functions (Minsitry of Law and Human Rights Indonesia 2014). In the latest masterplan for National Industry Development (2015-2035), the textile, leather and footwear sectors have been identified as the third most important industry group (Minsitry of Industry Indonesia 2015). Of further relevance is the Indonesia Climate Change Sectoral Roadmap (2009) by the Ministry of National Development Planning which envisions the country's development until 2030. It emphasizes the relevance of GHG reduction through measures such as energy efficiency or the use of alternative fuels (ICCSR 2009). The country has a basic Act on the Environment which defines hazardous materials and toxic waste, and incorporates regulations specifically on air, water and waste management (UNEP 2017). The Waste Management Law of 2008 places a focus on waste reduction, recycling, reuse and treatment (Ministry of the Environment Indonesia 2008).</p> <p>The National Action Plan for Climate Change Adaptation of 2012 focusses specifically on food and energy security to increase the country's resilience, but does not specifically address sustainable production or consumption as a strategy (Ministry of National Development Planning 2012).</p>
<p>SPP/GPP</p>	<p>The government aims at offering incentives for SPP by ministries; however, does not specifically relate to leather goods. A presidential regulation of 2012 states that certain requirements can be demanded in regard to the sustainability of the public procurement of goods. The efficiency, effectiveness and reduction of carbon emissions of the procurement are especially relevant in this regard. A report on the current level of SPP revealed the consideration of sustainability criteria in some ministries, considering for instance the empowerment of SMEs and women-led enterprises. Procurement of environmentally sound goods are among the instruments to achieve economic development in the Indonesian Environmental Protection and Management Law of 2009 (FAO 2009).</p>
<p>Ecolabelling</p>	<p>A Law of 2009 concerning Environmental Protection and Management describes environmentally sound labelling systems as one of the country's instruments to support economic development (FAO 2009). A regulation of 2017 states that the development of eco-friendly labelling is to be provided by the central government for more eco-friendly products (Septiandara 2017).</p> <p>An Indonesian eco-label scheme Ekolabel was established in 2004 in order to improve the industry's products and to raise awareness among consumers. It contains specific</p>

	criteria and certification requirements for textiles and leather goods. In addition to the Ekolabel, the Leather Standard and Eco Passport by Oeko-tex and Testex are referred to as certification schemes in the leather and textile market of Indonesia. Apart from these, the Indonesian Ecolabel Institute, an NGO, currently certifies sustainable natural resource management, but mostly confined to the wood sector at this moment.
Sustainable SMEs	In a Directorate of SMEs, the Ministry of Industry expresses its goals to implement policies and generally strengthen the position of SMEs (Minsitry of Industry Indonesia 2015). The Green Industry Development Law aims to support small and medium-sized industries in their competitiveness, to play a role in the strengthening of national industrial structure, to contribute to poverty eradication through the expansion of working opportunities, and finally to produce industrial goods and services for export. The Master Plan of National Industry Development (2015-2035) states that SMEs will have special policies which shall be formulated by local governments to give SMEs a more advantageous position in order to help them grow and develop in managerial and technical regard (Minsitry of Industry Indonesia 2015).

3.5.4 Key SCP related initiatives

Under the National RECP Programme, implemented by UNIDO, the competitiveness and profitability of key manufacturing sectors were improved through responsible business practices. Pilot demonstrations, trainings and assessment services were undertaken in companies located in major regional manufacturing hubs that represented major consumers of material, energy and water consumption ([UNIDO 2017](#)). PT Budi Makmur is one of the larger tannery organizations in Indonesia and largest player in Yogyakarta. It is a best practice example in the country to reuse water, reducing effluent salinity and using wood waste to create heat, instead of fuel oil.

According to the Directorate General of National Export Development, Ministry of Trade of The Republic of Indonesia, the enhancement of the national leather industry will continue to 2035, as foreseen in the National Industrial Development Master Plan (Rencana Induk Pembangunan Industri Nasional or RIPIN). The success of the master plan strongly depends on the cooperation with other stakeholders, such as exporters and producers of leather and leather products (Ministry of Trade Indonesia 2018).

3.6 Lao PDR

3.6.1 Sectoral profile

3.6.1.1 RMG sector

Lao PDR is a small, landlocked country that has a young, but unskilled workforce ([United Nations Environment Programme 2017](#)). Till date, it is classified as a Least Developed Country (LDC). The majority of Laotians work in agriculture. The little industry that operates in the country is mainly constituted by small companies (99% SMEs). Nevertheless, the country is expected to modernize and develop rapidly in the coming years with growing transport, tourism and industrial sectors (SCP course outline for national university of Laos). In 2013, the industrial sector consisting of 124,567 companies accounted for 33.2% of GDP ([Schoeder et al. 2017](#)).

In 2015, there were approximately 100 to 120 garment and textile factories in Laos, mainly located in the areas of Vientiane and Savannakhet. About a quarter of the factories are foreign owned; 11 are owned

jointly by Lao nationals and foreign parties; another 11 are owned by Lao nationals. The ownership of the remaining ones is not clear ([Clean Clothes Campaign 2015b](#)).

The RMG industry of the country is relying on imported textiles since there is no textile producing industry in Laos. Garments make up 4% of exported goods in Laos (as per 2013) making it the fourth largest sector and contributing to the country's exports with a value of about 178 million EUR in 2014. As of 2015, the EU was the main export destination for Laotian garments, followed by Japan and the US ([Clean Clothes Campaign 2015b](#)).

The RMG sector in Laos presently employs around 30,000 workers, and could potentially employ 60,000 ([Clean Clothes Campaign 2015b](#)). Workers often come from rural areas hoping for a better income. The low productivity in Lao factories due to the prevalence of a unskilled work force, keeps wages down and makes working hours go up. In addition, trade unions are largely under government control ([Asia News Network 2017](#)). Higher wages offered in neighbouring countries attract many textile workers to move to Thailand. The shortage of labour in the sector has been a main reason for the decline of the garment sector in recent years.

The disposal of chemicals from factories presents a threat to the countries communities and environment. The collection of chemicals statistics is not accurate, but there is no premise for the treatment and disposal of dangerous chemical waste and other dangerous waste in general. Therefore, such waste is often treated together with regular waste from the communities. However, the government has assigned the Ministry of Industry and Commerce to coordinate with other relevant sectors the drafting of a Law on Chemicals which was passed by the members of the National Assembly legislature in 2016 ([Asia News Network 2017](#)).

3.6.2 Consumer profile

The Lao People's Democratic Republic presents an exception to the fast-growing economic powerhouse in East Asia. A majority of the population is still engaged in agricultural farming, which is the reason why the purchase power of the country is generally low ([Bouahom et al. 2004](#)). Around 80% of the population is dependent on natural resources in order to fulfil their household needs ([United Nations Environment Programme 2017](#)). Foreign investments are only gradually increasing, and poverty rates are only slowly decreasing ([Phonsavath 2017](#)). A majority of people living in urban areas is earning less than USD 333 per month. Lao people still dress rather traditional, for example in the traditional sarong. Word of mouth is a strong influence among consumers. Wet markets, convenient stores and traditional grocery stores are the most popular points of sale (Khonkaen University 2014b).

Lao's material footprint per capita of consumption is lower than in comparable countries because people generally consume less. Material efficiency on the other hand, is comparably lower than the regional average ([United Nations Environment Programme 2017](#)).

3.6.3 SCP framework

SCP policy

Currently, there is no policy for SCP in place. However, there are several national agendas that touch upon SCP. The 8th National Socio-Economic Development Plan from 2016-20 planned to increase the annual growth rate in the industrial sector to 15% by 2020 and emphasised economic development through attraction of FDI and growth of the industrial sector. Further focus is put on sustainable urban development through waste reduction and integrated wastewater refreshment systems ([United Nations Environment Programme 2017](#)).

The Vision 2030 Strategy which resulted from a National Roundtable Process Meeting by the Ministry of Planning and Investment states different goals to achieve green growth of the country through measures such as supporting green productivity,

	<p>reducing the consumption of natural resources and reducing CO₂ emissions and other environmental impacts (Anbumozhi and Kimura 2018).</p> <p>Lao PDR has a basic Act on Environment as well as regulations on water and industrial waste discharge. It has guidelines on Environment Ambient Standards and Pollution Emission Standards. The Industrial Waste Discharge regulation defines waste as sewage, wastewater, air pollution, toxic waste, and hazardous waste, including sludge in form of solid, liquid or gas (UNEP 2017).</p>
SPP/GPP	Lao PDR does not have GPP laws or policies since the awareness and sensitization in this area is low among the government and general public (Rajan R Gandhi 2014).
Ecolabelling	Lao PDR has not implemented a national eco-labelling programme. A possible reason is the general lack of awareness amongst both the government and private sectors. At present, there is no legal base supporting the establishment of an eco-labelling programme. Very few internationally recognized eco-labels are used in Laos, for example the World Fair Trade Organization Label and in a few cases OekoTex. Outside the garment sector, some local initiatives have created eco-labels often in combination with heritage projects (Handmade in Luang Prabang, Chai Lao) (Rajan R Gandhi 2014).
Sustainable SMEs	According to SME development policies in Laos, the majority of Laotian employees are working for SMEs, which account for more than 99% of all units in Lao. A Decree of the Promotion and Development of SMEs encompasses a SME Promotion and Development Fund and supports organizations to promote sustainable growth of SMEs. This is supposed to contribute to employment creation, a raise in living standards, and to lay the foundations for gradual industrialization and modernization, as well as to contribute to sustainable growth of the national economy. Support is rendered in the form of financial, technical, managerial, informational and promotional activities and network building. Since there are no national policy frameworks for SCP in place till date, and due to the fact that no marketing for sustainability is taking place, the awareness of the concept among Laotian SMEs remains low. Staff is generally not trained in this regard, and BAT as well as best available environmental practices are not known (Schoeder et al. 2017).

3.6.4 Key SCP related initiatives

In order to drive SCP in Lao PDR, the Ministry of Environment and Natural Resources (MoNRE) collaborated with TERI University and National University of Laos (NUOL) to develop the SCP Curriculum in tertiary education in Lao PDR in 2017. The project was financially supported by UNDA ([National University of Laos 2013](#)). Besides the new SCP Curriculum for tertiary education, the project included a scoping study on SCP, as well as trainings for trainers for academic officials (NUOL) and technical staff ([Ministry of Natural Resources and Environment 2017](#)).

In 2016 the NCPC of Lao PDR, an initiative by UNIDO completed a three year project on enhancing sustainable tourism, clean production and export capacity in Lao PDR ([Cleaner Production Center Lao PDR 2019](#)) with the objective to reduce poverty and to install sustainability in the country's industrial sectors through RECP measures.

Under SWITCH-Asia (EU), the Sustainable Product Innovation in Vietnam, Laos and Cambodia (SPIN) programme was implemented in 500 companies of Vietnam, Laos and Cambodia with 2000 products redesigned towards higher sustainability.

A group of textile and garment associations called the ASEAN Federation of Textile Industries (AFTEX) has launched the Source ASEAN Full Service Alliance (SAFSA). SAFSA aims to link ASEAN apparel factories, among them Lao factories, to create a virtual vertical supply chain between buyers, textile mills, and apparel factories, enabling businesses to offer a complete service package to international buyers ([Invest Asean 2015](#)).

The Water Environment Partnership in Asia (WEPA) is an initiative introduced in 2003 by the Japanese Ministry of the Environment focussing among others on Cambodia, Laos and Myanmar. During three phases, WEPA completed different tasks like developing a web-based information platform covering the state of water environment and management in the partner countries, knowledge-sharing on key thematic areas of water environmental management, including 'domestic wastewater treatment' and 'climate change and the water environment' ([WEPA 2017](#)).

3.7 Mongolia

3.7.1 Sectoral profile

3.7.1.1 RMG sector

Around 90,270 SMEs operate in Mongolia accounting for 69% of all private enterprises (2017). 66.5% of companies are located in Ulaanbaatar, while the rest operates from rural areas, making the capital the industrial centre of the country ([Ziker 2019](#)). Women-owned businesses in the industries that concern wool, cashmere, sewing, greenhouse and intensive farming account for 60% (IFC 2014). These sectors are predominantly informally organised. The Mongolian garment manufacturing industry has been steadily growing currently employing over 20,000 workers representing about 12% of the country's overall workforce ([Smith 2004](#)). Textile-based products account for 5.8% of all exported goods. Especially cashmere presents a crucial foothold for the countries' economy as Mongolian cashmere accounts for 15% of the global production. With a production of over three thousand tons of raw cashmere per year, Mongolia is the second largest producer of raw cashmere in the world, behind China. However, in recent years difficulties with overgrazing and extreme cold winters lead to indebtedness of many herders ([Murphy 2019](#)) ([Lecraw et al. 2005a](#)) ([PAGE 2017](#)).

3.7.1.2 Leather sector

The leather industry in Mongolia predominantly focuses on herding, and also plays a crucial role in the country's economy. Unlike in the garment sector most herders are male. The Mongolian tanneries process around 20 million pieces of skin per year. With 34 small-scale tanneries, Ulaanbaatar is the main hub where the majority of tanneries are located. 16 of the plants process small cattle hides and skins, with a total capacity of 4000 - 8000 pcs per day. While four plants are capable to process 200-1000 large and small cattle skins per day, and the remaining 12 plants are very small and process 50 - 70 big cattle skins per week only. Some plants are situated in the Leather Association Industrial Park outside of Ulaanbaatar, while some are situated inside the city itself, close to the Tuul River where they create serious environmental issues due to a lack of treatment facilities. Chromium-based tanning technology is still prevalent in Mongolian tanneries, which according to studies is said to harm the environment and even affect the fertility of tannery workers ([Greene et al. 2010](#); [Shombodon and Williams 2001](#); [Asian Development Bank 2004](#); [PAGE 2017](#)).

3.7.2 Consumer profile

Mongolia is an emerging market in Asia that imports a considerable amount of goods, especially from developed Asian countries such as Korea. Many Mongolians have access to, and can afford a variety of foreign products. Consumers generally pay high attention to the country of origin of a product. According to the Mongolian Statistical Office, the monthly household income is at average around 945.118 MNT which translates to about EUR 320. Amongst middle class households, clothing was found to be the largest non-food category that money was spent on, constituting about 16.1% of total consumption at national level ([Byambaa et al. 2014](#)). Nevertheless, a large part of the Mongolian population is working in agriculture. Many households are supplying themselves with home-grown food. Herding of sheep, goats or cattle is a major economic activity in Mongolia. The food crops and livestock products they consume include wheat, rice, potatoes, garden vegetables, mutton, beef, horse meat, milk, butter, chicken, and eggs. Animal dung is used to a large extent for heating as well as wood ([Zhen et al. 2010](#); [Haliun and Cho 2015](#); [National Statistics Office of Mongolia 2017](#)). Mongolian online purchases are developing slowly compared to the state of the world market due to lack of trust and high perceived risk by consumers for instance regarding quality (Enkhbayar and Huang 2018).

3.7.3 SCP Framework

SCP policy

After having hosted the green environment day in 2013, the Green Development Policy for Mongolia was launched a year later. Following this, the Ministry of Nature, Environment and Tourism published an action plan of Green development policies for Mongolia with targets until 2020 and 2030 containing six identified specific objectives, including an implementation plan for each ([Ministry of the Environment, Green Development and Tourism 2014](#)).

Mongolia developed the National Green Development Policy (NCDP) with a corresponding action program from 2016 to 2020 in order to develop a sustainable economy, implement green growth policies, introduce advanced and effective technology, operate friendly to the environmental and human health, save resources and ensure their reuse and recycling, reduce air, water and soil pollution and implement appropriate waste management systems ([Government Action Plan Mongolia 2016](#)). The Policy was adopted by the Parliament and an action plan for implementation came into effect in 2016. The NCDP sets clear goals for SCP to be reached. To achieve the defined objectives, SPP as well as taxes and incentives have been highlighted as adequate instruments ([UN Environment and Ministry of Finance Mongolia 2017](#)).

Key indicators on the road to inclusive, environmentally sound economic growth include efficient natural resource utilization, recycling, green employment, green investment, green procurement and environmentally-friendly production. Several governmental instruments were used to incentivize sustainable production, such as tax incentives. Water price for production processes was furthermore increased to encourage water saving and reuse. In 2014, 73 million tonnes of water were re-used ([Government Action Plan Mongolia 2016](#); Secretariat of the State Great Hural 2016).

A sustainable development vision published in 2016, showed 10 goals with short-, middle and long-term activities which should be achieved until 2030 concerning socio-economic aspects, while taking few environmental aspects into account (Secretariat of the State Great Hural 2016).

SPP/GPP	<p>In 2001, the first Public Procurement Law in Mongolia was adopted. Since that time the law has been revised more than 20 times. In the Law on Procurements of Goods, Works and Services of 2005/2006, the Mongolian Government states that locally-produced goods and materials or manufacturing facilities that employ local workforce are given priority during tender evaluation (Communications Regulatory Commission Mongolia 2005).</p> <p>To meet the aim that by 2020 a minimum of 20% of public procurement will be green as specified in the NGDP, the Mongolian Ministry of Finance developed SPP Guidelines in the course of the Project Stimulating Demand and Supply of Sustainable Products through Sustainable Public Procurement and Eco-Labeling (SPPEL) funded by the European Commission and led by UN Environment. With regards to public procurement, the NCDP solely considers environmental factors.</p> <p>Public spending of the Mongolian Government represented 32% of GDP in 2014; public procurement of products and services amounted to around 12% of GDP. In 2015 and 2016 the status quo of public procurement was analysed and three priority products were chosen to be procured sustainably, namely A4 copy paper, printer ink cartridges and lightweight concrete blocks. More products and sectors might be included in the future (UN Environment and Ministry of Finance Mongolia 2017).</p> <p>The Partnership for Action on Green Economy (PAGE) has supported to incorporate sustainability principles in the national public procurement framework. An Action Plan for SPP covering legal framework, implementation, capacity building, communication, monitoring and evaluation has been established in 2017. According to this, bidders will be selected based on guidelines for evaluation covering social, economic and environmental criteria (Ministry of Finance and Ministry of the Environment and Tourism Mongolia 2017).</p>
Ecolabelling	<p>An ongoing initiative under EU-SWITCH (STeP) focuses on the propagation and introduction of sustainable textile production and eco-labelling. STeP was initiated in Mongolia in 2018 and will continue until 2021. It aims at supporting the Mongolian economy, SMEs and the policy makers in engaging into more environmentally, socially and economically SCP patterns. The actions specifically target air pollution related issues in urban areas, as well as sustainable sourcing and production methods for the Mongolian textile (cashmere) industry. SteP is furthermore taking part in a comprehensive certification system by OEKO-TEX® for brands, retail companies and manufacturers from the textile chain. The ongoing project is working with 20 SMEs to attain 'Oeko-tex Made in Green' ecolabel. This represents around 90% of the production volume destined for the EU market. The STeP certification is based on a modular approach which looks into all relevant company areas such as management of chemicals, environmental performance, environmental management, occupational health and safety, social responsibility and quality management (European Union 2018).</p>
Sustainable SMEs	<p>The Mongolian Government developed a Law on SMEs in 2007, followed by the set-up of a Governmental Agency in 2008 and a Development Fund for SMEs in 2009 (Dandar and Gurbazar 2018). The Action program, of 2016-2020 states that small, medium and household production and micro business owners will be offered a Loan of Trust (Government Action Plan Mongolia 2016).</p> <p>In addition, the national tax law exempts equipment bought by SMEs from customs and the VAT. Moreover they pay only 15% income tax to the Mongolian government compared to the basic income tax of 30% (Lecraw et al. 2005b).</p>

Regarding SPP, a single service point information centre will be established to provide information and support to SMEs ([Ministry of Finance and Ministry of the Environment and Tourism Mongolia 2017](#)).

3.7.4 Key SCP related initiatives

The Mongolian Ministry of Food, Agriculture and Light Industry collaboratively with the Italian Ministry of Economic Development created a Letter of Intent on Cooperation in the Textile Industry. For the purpose of improving the Mongolian textile industry, Italy appeared willing to provide high technology textile equipment, train personnel, share know-how and support the improvement of management. A relevant actor in the implementation phase of the project is the Mongolian Wool and Cashmere Association. Additionally, the Ministry adopted a Cashmere Program in 2018 and set goals to manufacture final products with up to 60% of total raw materials a year.

An initiative that directly linked the development and implementation of the illustrated Green Development Plan was PAGE, which provided technical support, fostering political commitment, and modelling economic, social and environmental implications of GDP targets. With the support of PAGE, the Ministry of Environment, Green Development, and Tourism (MEGDT) published the handbook Introduction to a Green Economy.

Mongolia's Green Development Policy was further supported by the Global Green Growth Institute (GGGI) in identifying the points of convergence and proposing a set of outcome-level indicators to be used in tracking the progress of the first phase of implementation since 2014.

For various types of consumer goods e.g. textiles and leather, a new version of the Mongolian Eco-label standard and procedures was drafted as part of the SWITCH Asia project Green Products Development and Labelling. In this project 43 companies developed and implemented green ideas including energy efficiency, water use efficiency, product improvement/eco designing, and the 3R (recycling, reuse, reduce) principles. More than 370 companies attended information and expert training seminars. 150 eligible green product applications with 80 companies were selected for further support and for in-depth training.

The company Aduumal developed a standard for leather goods in the country in collaboration with local initiatives, companies and the Deutsche Investitions- und Entwicklungsgesellschaft. Besides fulfilling the standards in their own leather good line themselves, mainly exporting goods to the Netherlands, the company wants to provide support to other Mongolian leather companies to develop sustainability strategies and adopt the standard ([ADUU MAL 2019](#)).

As Cashmere wool is an important raw material for the Mongolian textile industry, several projects financially supported the development of Sustainable Cashmere production. One of them was supported by the European Bank for Reconstruction and Development (EBRD) aimed at improving pasture, herd and fibre collection management ([EBRD 2018](#)).

The Asian Development Bank (ADB) provided a corporate loan to the private company Gobi Joint Stock Company, the largest cashmere manufacturer in Mongolia. As an integrated cashmere producer, Gobi manages its entire value chain from sourcing raw cashmere directly from herders to processing and manufacturing cashmere products at its primary and secondary processing facilities in Ulaanbaatar. The still ongoing project will support Gobi in expanding its primary and secondary processing capacity, adding more value domestically and further integrating the cashmere value chain.

In addition, UNDP also provided funding on developing a Sustainable Cashmere Value Chain for a 2018-2019 pilot with three components. First, the implementation of a pilot project to test the viability of a value chain business model for sustainably produced cashmere in Khentii and Dornod launched in March and April 2019. Secondly, the development of a roadmap to build a common understanding of Sustainable Cashmere by engaging all stakeholders to increase the private sector investment in

Sustainable Cashmere; and finally the establishment of a funding window for an investment facility to crowd in private capital in Mongolia's livestock and agricultural sector to promote consistent supplier-buyer relationships that result in climate resilient pastureland management.

In order to preserve and restore grasslands, ensure animal welfare and secure livelihoods, Sustainable Fibre Alliances (SFA) promotes a global sustainability standard for cashmere production which follows three goals: environmental resilience in cashmere producing regions; improved long-term prospects for herding communities that rely on cashmere markets; assurance on animal welfare within cashmere production ([Sustainable Fibre Alliance 2019](#)).

Finally, the Mongolian Sustainable Finance Association (MSFA) promotes sustainable growth through a green financing system and by assisting Mongolian finance and business sectors to adopt activities that benefit both the environment and the society. Current aims include directing members' activities to issues facing sustainable finance, proposing solutions, and contributing to a balanced equilibrium between environmental, social, and economic growths ([Mongolian Sustainable Finance Association 2019](#)).

3.8 Myanmar

3.8.1 Sectoral profile

3.8.1.1 Textile and RMG sector

The export-oriented RMG sector belongs to one of the fastest growing industrial segments in Myanmar. In 2016, garment exports from Myanmar included over 80% of woven product categories and 20% knit categories, and accounted for USD 1.65 billion; a large part of those exports was delivered to Japan ([Ministry of Foreign Affairs Netherlands 2017](#)). As of 2017, there were 454 RMG factories. The growth is mainly driven by investment from Chinese investors who relocate or establish new production capacities outside their domestic market. The down-streaming links of the sector into textile production and weaving/fibre production are very limited. Most of the manufacturers active in the country are operating on a Cut, Make and Package (CMP) production system, whereby producers are only responsible for the pure production of the garments and not involved in the design and/or input sourcing processes ([ILO 2015](#)).

The social and environmental governance structure is at its infant stage, as far as policies as well as enforcement capacities are concerned. The textile, clothing and footwear industries jointly provide employment for 750,000 workers, a third of total manufacturing workers. With a majority being family-based establishments, 99.4% of all 127,000 companies that are registered in Myanmar, are SMEs ([Dutta and Abe 2014](#)). Accordingly, SMEs also account for 50-95% of employment. ([Charltons Myanmar 2014](#)). Young, childless, unmarried women often come from their natal state with the explicit purpose of working in a garment factory. Opportunities for the female employees to learn new skills or seek a promotion, however, are limited ([ILO 2019c](#)).

The industry is particularly challenged by high transport expenses, lack of infrastructure and erratic electricity supplies as well as lack of or unfavourable regulations. Especially locally-owned companies face difficulties to extend their activities towards higher value-adding processes (El-Shahat and Di Canossa 2018).

3.8.2 Consumer profile

70% of Myanmar's population lives in rural areas. Due to the fact that Myanmar does not have a strong production base of consumer goods, the country imports these from neighbouring countries,

such as Malaysia, Thailand, China, Singapore and India. The purchasing power is mostly concentrated in Yangon and Mandalay ([Yan Soe 2018](#)).

About two-thirds of the population earns between USD 125 and 500 per month. A typical household spends between 46-49% of its monthly income on food and other groceries, household products, and personal care products. There is a clear preference for local brands, especially outside of Yangon where foreign brands are largely unknown. For luxury items, however, foreign brands are increasingly preferred ([Eurocham Myanmar 2018](#)). The major energy source in Myanmar comes from biomass which accounts for 70% of total energy consumption ([Tun 2019](#)).

3.8.3 SCP Framework

SCP policy	<p>An Industrial policy report of 2016 by the Ministry of Industry states Myanmar's mission to create sustainable development for industries through effective resource use, energy efficiency, wastewater and solid waste treatment, as well as emission control and assessment (Ministry of Industry Myanmar 2016).</p> <p>The Myanmar Sustainable Development Plan expresses the country's vision until 2030. It states to implement plans that promote sustainable production, consumption and the use of natural resources, as well as ensuring water resource management, reducing energy consumption and providing waste management systems (Ministry of Planning and Finance Myanmar 2018).</p>
SPP/GPP	<p>The National Sustainable Development Plan foresees the development of regulatory frameworks for procurement to create an environment that encourages transparent competitive international tendering for nationally significant projects (Ministry of Planning and Finance Myanmar 2018).</p> <p>Regarding SPP, till date only the defence and education sectors have been considered as possible targets. Their level of interest, however, has been described as low.</p>
Ecolabelling	<p>Eco-labelled products are available, however, only for products to be exported overseas. As of date, there are no eco-labelling programmes in place for the domestic market and the awareness of such labels is very low (Rajan R Gandhi 2014; Asian Institute of Technology (AIT) 2016).</p>
Sustainable SMEs	<p>To support SMEs, the Government of Myanmar created a Central Department of SME Development in 2012, which operates under the Ministry of Industry. According to an industrial policy report of 2016, an additional working committee to support MSMEs in particular is supposed to be established (Ministry of Industry Myanmar 2016; Dutta and Abe 2014).</p> <p>The key ministries that are involved in the development of SMEs are the Ministries of Industry, Cooperatives, Commerce, Finance, National Planning and Economic Development, Agriculture and Irrigation, and Science and Technology (Dutta and Abe 2014).</p> <p>The Myanmar Sustainable Development Plan recognizes the role of SMEs and aims for a development that entails stronger linkages between firms, better regulations in regard to workplace safety, and non-discrimination including equal pay. SMEs are further to be enabled to increase the use of sustainable technology and practices (Ministry of Planning and Finance Myanmar 2018).</p>

3.8.4 Key SCP related initiatives

As a re-emerging sector, the fast-growing textile sector in the country receives support on sustainable production issues from a number of bi- and multilateral initiatives. Amongst these, the SMART Myanmar initiative ([Smart Myanmar 2019](#)) 2016-2019 under EU-SWITCH has been on the forefront in addressing SCP aspects in the country. The project involves consultancy services and capacity building for garment, footwear and textile factories on chemical management, energy efficiency, renewable energy, and electrical safety. According to information from sequa gGmbH ([Sequa 2019](#)), a follow-up initiative (SMART Tag) will be launched mid-2019. As part of the aforementioned, the German government supported the regional programme Social and Labour Standards in the Textile and Garment Sector in Asia (SLSG) and FABRIC; GIZ also engages with the textile sector on social and environmental issues. GIZ SLSG engaged in a 4-year project until 2019, which focused on social and labour standards in the Asian textile and garment sector. More specifically, the project aimed at improving working conditions in factories and at strengthening rights for female workers. Amongst others, a mobile app for the distribution of information and knowledge on labour law and occupational health and safety was developed ([GIZ 2019b](#)).

ILO is presently engaged in three main areas of activity: gender equality and women's empowerment as cross-cutting objectives of the project, worker-based training activities including gender equity and enterprise level activities (ILO 2019a).

3.9 Pakistan

3.9.1 Sectoral profile

3.9.1.1 Leather sector

There are more than 2,500 tanneries and footwear manufacturing units - partly registered, partly unregistered - in Pakistan. Over the years, the number of registered tanneries in the country has increased from 529 (2000) to 725 (2016). These are mostly located in clusters in Karachi, Hyderabad, Lahore, Multan, Kasur, Faisalabad, Gujranwala, Sialkot, Sahiwal, Sheikhpura and Peshawar. The increase in the number of tanneries and increased exports can be attributed to a growing demand for tanned leather in export markets ([Pakistan Bureau of Statistics 2016](#)).

The leather and leather product industries play an important role in the economy of Pakistan, employing around 500,000 people. By 2018, its contribution to GDP was 5%. The cottage industry meets the bulk of domestic demands, while the organized sector caters to export demands. Many footwear factories have an average production capacity of 2,500 pairs per day, whereas larger units produce as many as 10,000 pairs per day. The product range includes leather, textile and synthetic shoes ([Pakistan Footwear Manufacturers Association 2018](#)). Sectoral statistics in 2014 clearly showed that the capacity of this sector remained highly under-utilized ([Raza et al. 2014](#)). In 2014, the tanneries produced 60 million square feet of tanned leather despite an installed capacity for producing 90 million square feet. The 524 footwear units in the country produced 100 million pairs against an installed annual production capacity of 200 million pairs. In addition to the footwear sector, there are about 461 leather garments/apparels making units, which annually produce some 50 million pieces.

The Pakistan National Action Plan on SDG 12 by the Ministry of Climate Change in 2017 stated three main objectives regarding the industrial sector: (1) focusing on greening the supply chain by resource efficiency and clean technologies, (2) value addition and environmental compliance, and (3) the establishment of eco-industrial zones. The plan emphasizes the need to strengthen public-private partnerships, build collaboration between industries and trade bodies to move towards resource-

efficiency and cleaner production for sustainable industrial development, as well as to formulate and implement the National Industrial Policy with focus on the SCP concept. The plan also calls for the development and implementation of eco-standards and labelling to meet international standards particularly related to SCP as well as the streamlining of a green/sustainable procurement system based on quality compliance and standard rating of the product in the public and private sector. In this regard, the successful certification of organic cotton in Pakistan in January 2019 is considered an important step ([Ministry of Textile Industry Government of Pakistan 2015](#)).

For the textile sector, the Textiles Policy (2014-2019) specifically refers to the fact that more stringent requirements are emerging in the international market to ensure safety of the environment and a more equitable distribution of profits. Apart from compliance with international labour standards, the sector needs to move towards compliance in order to maintain its competitiveness and to react to changing market trends. This entails changes, such as producing textiles using Better Cotton in order to reduce the use of fertilizers, pesticides and water to a minimum.

3.9.2 Consumer profile

Pakistan is classified as a lower middle income country ([World Bank 2018](#)). On average, about half of consumers' household income is spent on food and beverages, followed by fuel and transport, and education. Clothes and footwear account for 5,48% of income spending ([World Bank 2019a](#)) ([Bureau of Statistics Pakistan 2015](#)).

A study about educated Pakistani consumers found that respondents had a very positive attitude regarding green products and appeared willing to buy green products more often. The product price and quality of green products however is required to perform competitively just like conventional products which they often do not. Hence, these consumers often stick to conventional products ([Ali and Ahmad 2016](#)).

3.9.3 SCP Framework

<p>SCP policy</p>	<p>Under the SWITCH Asia Regional Policy Support, Pakistan developed a National Action Plan on SCP which contributed to the 10YFP on Sustainable Consumption and Production Patterns. Till date, four policies have been launched in this regard: 1) the National Action Plan on Sustainable Consumption and Production, 2) the revised National Sustainable Development Strategy, 3) the Green Building Code Guideline, and 4) the Tertiary Curriculum for Sustainable Consumption and Production (UN Environment and Ministry of Climate Change Pakistan 2017).</p> <p>The Ministry of Textile Industry has published a textile policy with an action plan for 2014-2019 aiming to make the textile industry more sustainable. The Government, in collaboration with UNDP, has developed the Kasur Tannery Pollution Control Project to implement effluent collection, construct treatment plants and solid waste disposal sites, as well as to provide in-house pollution control methods in the area of Kasur where over 230 tanneries operate (UNIDO 2018b).</p>
<p>SPP/GPP</p>	<p>Despite the Government of Pakistan already having taken a few initiatives, the pace of SPP implementation is low. There are regulations and legal frameworks for procurement, such as the National Procurement Strategy 2013-2016, but there is a lack of specific guidelines for procurement officers to implement SPP practices (Nadeem et al. 2017).</p> <p>A study by COMSATS University Islamabad and Beijing Institute of Technology identified twelve key barriers that hinder sustainable procurement implementation in</p>

	Pakistan. Amongst other external factors, government legislation and stakeholders' pressure were found to be the most critical barriers. The study concludes that the government needs to introduce rules and regulations to implement sustainable procurement, while stakeholders and donors need to put pressure on organizations for adopting sustainable procurement methods. Purchase officials lack information and face difficulty in preparation of tender documents and purchasing. The absence of clear definitions and lack of evaluation standards for green procurement are clear hindrances to SPP implementation. In the public sector, funds are allocated on the basis of traditional market prices, putting higher priced green items at a disadvantage. One recommendation by the researchers is the establishment of a Procurement Forum for public sector procurement officials where they can discuss their procurement issues pertaining to sustainability, share their best practices, models and templates (Zaidi et al. 2018).
Ecolabelling	To date, the Pakistani leather industry is lacking a standard or labelling scheme in general, as well as specifically in regard to sustainability. Textiles are rarely labelled or certified (Ravi Magazine 2017). A study of 128 textile companies found that 32% of Pakistani textile firms used an eco-label; many of these firms were active in yarn production (Hayat and Hussain, Anwar Lohani, Heman D. 2018). One of the largest Pakistani textile operators employing 1,800 workers has introduced the EU Ecolabel and Oeko-Tex 100 for home textiles (Ikram and Qureshi 2018).
Sustainable SMEs	The SME Development Plan of 2018 identified the need to step up the promotion of SME growth. Textile and leather industries are among the predestined sectors for this intended action. Access to finance for SMEs is ensured through equity support programs promoting sustainable businesses in particular.

3.9.4 Key SCP related initiatives

Similar to Bangladesh, several bi-laterally and multilaterally supported initiatives are under implementation in the textile, RMG and leather sector addressing SCP-related aspects in Pakistan. Some of the textile sector focused projects may have a cross-over effect for the leather sector. Under its Pakistan Textile Cluster Programme for example, GIZ has been executing several projects in the area of social and environmental standards. These include initiatives such as (a) Improving Labour Standards in Pakistan's Textile Industry ([GIZ 2019a](#), 2017-2020), (b) Implementation of Social Standards in the Textile and Garment Industry in Punjab (2014-2016 ([GIZ 2016](#))), and (c) Water Efficiency in the Textile Industry (WETI, 2015-2018, ([Textilbuendnis 2018](#)). Environment-related aspects will be further covered under a country-specific component of GIZ' regional FABRIC programme (2019-2021). In addition, water efficiency and wastewater aspects are also being addressed under the InoCottonGrow ([InoCottonGROW 2019](#)) ([BMBF Grow 2018](#)) which focuses on giving innovative impulses towards reducing the water footprint of the global cotton-textile industry in lieu with the SDGs.

In 2018, IFC PACT (see PACT initiative in Bangladesh) expanded its activities to Pakistan, pursuing similar goals as in Bangladesh. For this purpose, IFC PACT has teamed up with two American brands so far, planning to further increase its engagement in the textile sector. There are no plans for expanding the scope to the leather sector.

From 2012 to 2015, ESPIRE GREEN, an initiative under EU-SWITCH, executed by Training and Development Centres of the Bavarian Employers' Associations (bfzgGmbH), sequa gGmbH and its local partners focused on increasing energy efficiency and green productivity in the Pakistani Industry, particularly SMEs. As part of the initiative also the textile sector was covered.

The earlier EUROPE-AID funded initiative Sustainable and Cleaner Production in the Manufacturing Industries of Pakistan (SCI-Pak, 2008 -2012) specifically aimed at improving the Energy and Resource Efficiency (E&RE) of Pakistan's textile and tannery industries along the complete process chain. At the same time, it contributed towards widening the scope of Sustainable Production (SP) at the local, national and international levels ([Switch Asia 2008](#)).

The leather sector in Pakistan also has received assistance from UNIDO at various stages with regard to environmental and safety/health aspects since the mid-90s. While the initial efforts focused on the implementation of cleaner production and common wastewater treatment facilities in the two leather clusters Korangi and Kasur, later efforts have focused on addressing social standards in the leather product sector (e.g. Sialkoth). Presently, UNIDO engages with the leather sector on (a) transforming it towards low emissions and climate resilient development paths (2016 – 2020, [UNIDO 2019b](#)) and (b) mainstreaming climate change adaptation through water resource management in Leather Industrial Zone Development (2015 – 2019, [UNIDO 2019a](#)).

3.10 Sri Lanka

3.10.1 Sectoral profile

3.10.1.1 Textile and RMG sector

The Sri Lankan textile sector comprises of 1,862 units employing around 56,000 persons; with the RMG sector adding around 3,423 units engaging 515,183 people. Textile and RMG units account for roughly 25% of all industrial units and 50% employment in Sri Lanka ([Department of Census and Statistics 2018](#)). Over 85% to 90% of businesses in Sri Lanka are SMEs which play a significant role in facilitating the country's economic growth while also providing 70% of employment ([Daily News 2018](#)). The sector, however, is dominated by a few large-scale export-oriented factories. Sri Lanka's apparel export industry is one of the most significant contributors to the economy. The industry has recorded substantial growth levels over the past four decades and is currently accounting for approximately 40% of total exports ([Export.gov 2018](#)). The main line of textile products is based on rubber and synthetic fibres. Imports (mostly from China, Vietnam and India) largely cater to local urban markets.

Sri Lankan apparel manufacturers were among the first in the world to inculcate fair labour practices and safe working conditions throughout the manufacturing process. As a result, the Garments Without Guilt certification was implemented, under the umbrella of the ([Sri Lanka Apparel 2019](#)). A few local companies in the sector have gained international recognition for addressing social and environmental standards. For example, BRANDIX (Green Plants) was the first apparel manufacturing facility in the world to be rated Platinum under the Leadership in Energy and Environmental Design (LEED) Green Building Rating System of the US Green Building Council (USGBC).The company has established plants in Bangladesh in which they try replicating the lessons from Sri Lanka.

3.10.1.2 Leather sector

According to information from the Export Development Board, the bulk of leather products made in Sri Lanka is made from imported leather. After a decline in domestic leather production, several local leather production units have been set up in the country in recent years. There are around 11 tanneries with a capacity of producing 25 tons of leather per day. Most of the (few) large companies have their own tanneries. As the supply of locally tanned and finished leather is not sufficient to meet the requirements of the export industry, the government has allowed duty-free import of raw material to facilitate the industry. As per the Ministry of Industries, leather and related product segment comprise of 412 units with a total

of 9,268 persons employed (of which 335 units with less than 25 employees, the remainder units with more than 25 workers in 15 tanning units and 63 leather footwear manufacture units).

Due to concerns about waste and water pollution, the government took the initiative to relocate the tanneries from the larger Colombo area to a separate leather complex located at Hambatota at the Southern tip of Sri Lanka (Bataatta Leather Complex).

3.10.2 Consumer profile

A survey about consumer awareness revealed that Sri Lankans are generally in favour of environmental protection and are acknowledging consumers' role in driving change with 99% of participants linking impacts on the environment with consumption. Moreover, 60% of the study's participants possessed an understanding of 'green/sustainable/environmentally-friendly products', while 'green' or 'sustainable' consumption was less recognized by only 40%. Sri Lankans defined sustainable consumption mostly by minimizing resource waste and using energy efficient products. When taking consumption decisions, the price is the predominant factor that is considered, followed by quality. Food and electronic goods are products which are considered to be specifically relevant in that regard.

The larger cities such as Colombo and Kandy have a thriving market for fashion, catering to local population and tourists alike. The demand is met by a combination of locally-made and imported products, latter mostly from the region. Several designers and smaller boutiques emphasize sustainability aspects of their product ranges.

3.10.3 SCP Framework

SCP policy	<p>Sri Lanka has elaborated a draft SCP framework as part of the national SCP policy support component. Ten specific themes are targeted by this policy which concerns air, water, energy and waste management in six different sectors. The draft policy makes general reference to SCP aspects in manufacturing, though no particular reference is being made to either textiles/RMG or the leather sector (Ministry of Mahaweli Development and Environment 2018).</p> <p>The Ministry of Mahaweli Development and Environment developed a National Waste Management Policy-2018, which includes solid waste (e.g. industrial, marine, e-waste), liquid waste (e.g. industrial, sewage, chemical leachate), gaseous waste.</p>
SPP/GPP	<p>In November 2006, the Finance Department and National Environment Protection Administration declared The Implementation Guidelines for Environmental Symbols Products and the first Government Procurement List for Environmental Symbol Products (or The List). The Guideline stipulates that agencies relying on the government budget need to give preference to products labelled as environmentally-friendly, and cannot procure products that are harmful to the environment and human health (Senaweera and Parasnis 2018).</p> <p>The National Procurement guidelines, which were published in 2018, include references to GPP, though SPP as such is not being mentioned. Organisational entities/areas for which GPP in the textile and/or leather sector may be relevant are the (i) education sector (school uniforms), (ii) defence sector (military uniforms, boots), (iii) civil aviation (public airlines), and (iv) hospitals. All government institutions are expected to take environmental considerations into account when procuring goods, works, services and information systems. It lays down eight guiding principles which among others call for minimizing purchasing of products related to waste, toxicity, habitat destruction, soil degradation and GHG emissions, maximizing efficiency (resources, water, energy),</p>

	<p>purchasing of eco- labelled products/services, and applying the Polluter Pays Principle (National Procurement Commission Sri Lanka 2018).</p> <p>According to the National Policy Framework for SME Development (2015), the Procurement Preference Policy is to be adapted to support SMEs by increasing the market share in government procurements (Ministry of Industry and Commerce Sri Lanka 2015).</p>
Ecolabelling	<p>A plethora of international labels exist and are in use for the export-oriented product segment of the Sri Lankan textile/garment sector. The garment sector has begun to specialize in high quality products and developed labels such as ‘Ethically Manufactured Garments’, ‘Garments without Guilt Certification’ and ‘Sustainable Environmental Friendly Manufacturing’ (Kinkini Hemachandra 2015). GOTS is also used by some textile industry entrepreneurs.</p> <p>The Institute for Market Ecology (IMO) has been active in the field of organic certification and is amongst others active in the sectors of natural textiles, sustainable forestry, and social accountability monitoring. The eco-label is currently used for a variety of organic products manufacturers in Sri Lanka (Senaweera and Parasnis 2018).</p>
Sustainable SMEs	<p>A National Policy Framework for SME Development was set up in 2015 to support SMEs in building green growth opportunities. The framework suggests resource efficiency and switching to alternative raw materials to address resource scarcity and cleaner production technologies and practices (Ministry of Industry and Commerce Sri Lanka 2015).</p>

3.10.4 Key SCP related initiatives

As part of the Regional Programme for Pollution Control in the Tanning Industry (UNIDO RePO), UNIDO supported its counterparts in Sri Lanka in preparing the relocation of tanneries from the outskirts of Colombo to a new leather complex in Bataatta (Southern Province).

Sri Lanka’s NCPC has established itself as the premier local organisation working on sustainability. As a non-for-profit organisation they set their own agenda but also act as a private service provider of trainings regarding chemical management, energy management, water auditing and footprint, environmental risk assessment, and wastewater treatment facilities ([NCPC Sri Lanka 2019](#)). Due to its unique role, NCPC Sri Lanka is expected to be closely involved in the further roll-out of the national SCP policy.

The One Planet Consumer Information Programme has recently finished a SCP-related project. The main objective was to strengthen sustainable consumption in the country and to create synergies between the 10YFP Consumer Information Programme and Green Public Procurement.

Switch-Asia has assisted in promoting environmentally Sustainable Production practices and technology amongst Sri Lanka’s key export sectors across the value chain, which include leather and footwear.

With the financial support of the Netherlands Enterprise Agency (RVO.nl), CSR Netherlands (MVO Nederland), the Embassy of the Netherlands in Colombo, and CSR Sri Lanka organised a Sustainable and Inclusive Business Scan (SIB Scan) to explore responsible business opportunities. The focus was on three sectors: textile, agro-food and tourism.

As part of an international collaboration project three research teams investigated the opportunities for high value innovation in post-production textile waste. The project was initiated through the collaboration between IfM’s (Institute for Manufacturing) Centre for Industrial Sustainability (CIS) at the University of

Cambridge and TransTextile. Five promising innovation routes were identified, including the use of the waste materials to make beanbags, denim interior panels and 3D printing powder ([IfM 2017](#)).

A Sri Lankan company that stands out as a frontrunner regarding sustainably produced textiles is 'Green Keepers', who claim to have recycled over 25 million kilograms of textile waste generated by Sri Lanka's apparel industry. After winning the environmental innovation award in 2017, Green Keepers intend to set up a textile waste recycling mill in Sri Lanka to convert textile waste to yarn and non-woven products ([Greenkeepers 2019](#)).

3.11 Vietnam

3.11.1 Sectoral profile

3.11.1.1 Textile and RMG sector

Vietnam is amongst the ten largest textiles and garments exporters worldwide. In 2017 the country reached textile and garment exports of USD 31 billion (KPMG International 2018). SMEs play a major role in Vietnam's economy and account for 98% of all enterprises generating approximately 40% of GDP ([Samuel 2019](#)). According to local records, more than 5,000 MSMEs are involved in the textile/RMG sector of the country; many of these sourcing products/raw materials from households at village level. On a national level, however, raw material is mainly imported, specifically from China, which accounts for 50-60% of sourced raw materials; only 2-3% are sourced domestically (KPMG International 2018). Around 6,000 factories (2017), of which 15% are foreign owned and 84% privately owned ([IDS Trade 2010](#)), exist in total. The industry is the country's largest industrial employer with two million workers in textile and garment manufacturing (KPMG International 2018). 80-85% of those textile workers are female. Over 80% of textile and garment enterprises inspected in 2015 violated policies regarding working hours, rest periods and other labour safety regulations ([Huong 2017](#)). The country is currently focussing on specialization and modernization.

3.11.2 Consumer profile

Current research concludes that awareness and knowledge on sustainable consumption is generally low among the Vietnamese urban middle class. If a sustainable lifestyle is aspired to, this is generally motivated by health reasons. Especially in regard to food consumption, Vietnamese consumers pursue sustainable options and seek alternatives. Previous studies further found that awareness about environmental issues is currently not very strong but could be increased by making knowledge more accessible and by promoting sustainable role models. A bottom-up approach of initiatives is believed to have the highest potential to influence consumer behaviour due to a general level of distrust towards business and government actors ([Koning et al. 2015](#)).

Like in other booming Asian economies, 'fast fashion' has established itself in the main urban areas of Vietnam. Vietnam's economy has experienced rapid growth in recent years, and average annual income reached USD 2,200 last year, according to the World Bank in 2017. According to statistics by London-based Business Monitor International, the total value of the Vietnamese fashion market hit USD 3.8 billion in 2018, with spending on clothes accounting for more than USD 3.5 billion. The market's value is forecasted to expand to USD 5.08 billion by 2021, including USD 4.7 billion of spending on clothes. The preference among urban Vietnamese consumers is divided between local fashion and international brands, such as from Japan, Europe. Consumer surveys indicate that customers are primarily guided by price. A survey by Asia Plus Inc. stated that Vietnamese average spending on fashion was VND 550,000 (USD 24.3) per month, and only 7% of Vietnamese people spend more than VND1 million (USD 44.24) per month on fashion items.

The establishment of the ‘fast fashion’ phenomena is largely accelerated by international brands which try conquering the emerging fashion market in Vietnam, for example by carrying out 26-52 new product launches per year. These brands cater to an increasing middle-/affluent class population earning USD 714 a month or more. According to a study by Boston Consulting Group, the size of this customer group will reach about 33 million people or a third of the population by 2020.

The concept of fashion and apparel sustainability is still considered a novelty, though the community of supporters is said to be growing. There are a few designers who already carve out a niche for products emphasising sustainability performance.

3.11.3 SCP Framework

SCP policy

An International Declaration on Cleaner Production towards 2020 was published in 2009, aiming to promote sustainable production and consumption practices by raising awareness through education, encouraging investment in cleaner technology and supporting collaboration.

The Strategy on Cleaner Industrial Production (2010-2020) by the Ministry of Industry and Trade aims to provide technical support and awareness raising for cleaner production as well as improvement of state management regarding environment protection ([Vietnam Environment Administration 2009](#)).

Subsequently, the Viet Nam Sustainable Development Strategy for 2011-2020 was launched to integrate sustainable development principles in governmental policies in order to improve administration quality, enhance financial resources for sustainable development, improve awareness on the topic, enhance capacity for its implementation, increase the participation of businesses, NGOs and other relevant organizations, develop an adequately trained workforce, support science and technology development, and finally to expand international cooperation ([National Assembly Vietnam 2019](#)).

Based on this, the National Programmes on Sustainable Consumption and Production (NPSCP) for the period 2011–2020, and a vision outline for 2030 were introduced. The objective of the Programmes are to “*gradually change production and consumption patterns toward the improvement of efficient resources and energy, increase in consumption of sustainable products and renewable energy sources; reduce, reuse and recycle waste at all the stages of product life cycle from exploitation of materials, processing, distribution, consumption and disposal.*” Six tasks were identified to achieve this: develop the legal framework for implementation, promote restructuring in the economy, develop supply chains and improve market access for sustainable products, change consumption behaviour by encouraging sustainable lifestyles, and finally implement waste reduction, recycling and reuse activities ([Ministry of Industry and Trade Vietnam 2016](#)).

The Green Growth Strategy (2011-2020) that also includes visions for 2030 and even 2050 aims to achieve a low carbon economy and enrich natural resources. The overarching goal is the implementation of a clean industrialisation strategy for efficient resource use and proactive prevention and treatment of pollution through the use of adequate technologies ([Ministry of Planning and Investment Vietnam 2012](#)).

In the country’s Voluntary National Review of the SDGs (2018), it is noted that natural resource taxes, for instance on water resources, as well as environmental protection taxes and fees on wastewater have been applied (KPMG International 2018) ([Ministry of Planning and Investment Vietnam 2018](#)).

SPP/GPP	<p>Public procurement is regulated under a framework of 2007 for the procedure of procuring goods. It emphasizes the relevance of transparency, but does not yet encompass sustainability aspects (Ministry of Finance Vietnam 2007).</p> <p>In regard to GPP, the Vietnamese Government wants “to increase the proportion of sustainable products procurement in public procurement from state administrative authorities and enterprises” under the National Programmes on Sustainable Consumption and Production (NPSCP). This is to be achieved by assessing the status quo, the development of policies to promote GPP, and to finally develop GPP guidelines. The responsibility has been given to the Ministry of Finance (Minsitry of Industry and Trade Vietnam 2016).</p> <p>A Sustainable Public Procurement Action Plan was established by the Ministry of Natural Resources and Environment in 2017 with support of the EU and UN Environment, among others. It reveals that public spending accounts for 20-30% of the state’s financial budget. The National Green Growth Strategy expressed that state agencies should promote the procurement of environmentally-friendly products, however the implementation has remained low (Ministry of Natural Resources and Environment Vietnam 2017).</p>
Ecolabelling	<p>In a program for eco-labels (2009), the Ministry of Natural Resources and the Environment published targets and implementation plans to establish the Vietnam Green Label for eco-friendly, non-hazardous products in order to encourage companies to adopt sustainable practices and prevent natural degradation. The label, being administered by the Vietnam Green Label Office (http://vea.gov.vn) aims at supporting market development for sustainable products (Ministry of Natural Resources and Environment Vietnam 2009).</p> <p>The National Environmental Protection Strategy of 2010 with an orientation towards 2020 set targets to reach a 100% of exported products and 50% of domestically sold products to be eco-labelled by 2020 (Ministry of Natural Resources and Environment Vietnam 2017).</p> <p>Eco-labels are understood as a requirement to access global markets and improve the export of sustainable products. They may also increase awareness of sustainable consumption in the domestic market according to the NPSCP (Minsitry of Industry and Trade Vietnam 2016).</p>
Sustainable SMEs	<p>The Vietnamese Cleaner Production Centre has made the implementation of SCP practices in SMEs a requirement since 2010.</p>

3.11.4 Key SCP related initiatives

In Vietnam, several ministries have introduced initiatives and action plans towards SCP. A National Green Growth Strategy has been approved in 2012 by the Ministry of Planning and Investment for the period 2011-2020, envisioning several goals until 2050 such as the reduction of GHG, greening production, and promoting sustainable consumption. Under the Ministry of Industry and Trade, the Energy Efficiency and Sustainable Development Department developed a strategy on cleaner industrial production until 2020. A Vietnam Corporate Sustainability Forum was organised in Hanoi in 2017 regarding sustainable development. This was followed by a conference organised in 2018 by Vietnam Chamber of Commerce and Industry (VCCI) in Hanoi aiming to honour Vietnamese businesses that have contributed to the field of sustainable development ([VNExpress 2018](#)).

The project Renewable Energy and Energy Efficiency (4E) implemented by GIZ and commissioned by BMZ and the EU runs over the period of 2018 to 2021. The objective of the initiative is the large-scale expansion of renewable sources of energy and promotion of energy efficiency in Vietnam ([GIZ 2019c](#)).

The Vietnam NCP) promotes the implementation of resource efficient and cleaner production programmes in SMEs, enabling them to improve their competitiveness and reduce their environmental impacts. For the textile industry in particular, they implemented projects on boiler efficiency. Further, they are promoting industrial energy efficiency through a cleaner production/environmental management framework (CP-EE) project, in order to reduce industrial carbon dioxide emissions by improving energy management practices and to identify CP-EE investment for industrial enterprises ([NVCP 2019](#)).

As of mid-2017, the IFC worked with 50 Vietnamese factories that supply large retail corporations, to implement resource-efficiency projects in these factories. The goal of the so-called Vietnam Improvement Program (VIP) was to support sustainable manufacturing within the apparel, textile, and footwear sectors by promoting resource efficiency. They observed annual cost savings of USD 15 million due to resource savings and productivity gains as well as 100,000 tons of annually avoided GHG emissions.

UNIDO introduced an Eco-Industrial Park Initiative for Sustainable Industrial Zones partnering with the Ministry of Planning and Investment (MPI). This project, which is currently phasing out, aimed at transforming existing industrial zones into Eco-Industrial Parks (EIP), in which companies cooperate with each other and with the local community to reduce environmental impacts and production costs ([Eco Industrial Park Vietnam 2019](#)).

An important driver of SCP in Vietnam is the Vietnam Textile and Apparel Association (VITAS). In a collaboration with USAID, the Vietnam Low Emission Energy Program works on the common objective of developing and implementing renewable energy and energy efficiency projects in VITAS member facilities in an effort to reduce energy use and emissions ([VITAS 2019](#)). The association also arranges discussion rounds with representatives from WWF, VITAS, GIZ and IDH, amongst others. In 2017 for example, topics such as smart production towards sustainable development for the textile and garment industry, and the creation of a green vision of the textile industry were topics chosen. WWF and VITAS furthermore launched another 2-year project in 2018 aiming at greening Vietnam's textile-apparel sector through improving water management and energy sustainability ([The Voice of Vietnam 2018](#)).

The VCCI endorsed the World Bank Group's (WBG) Country Partnership Framework (CPF) with Vietnam in 2017. Four areas are being prioritized under the partnership; environmental sustainability is one of them (Worldbank 2017).

Under the umbrella of EU-SWITCH-Asia the Sustainable Product Innovation in Vietnam, Cambodia and Laos (SPIN) project was implemented. Under SPIN 2,000 products were redesigned towards higher sustainability in 500 companies in all three countries ([VNCPC 2014](#)).

4 Country profiles: Central Asia

4.1 Kazakhstan

4.1.1 Sectoral profile

4.1.1.1 Textile and RMG sector

The textile, clothing and footwear (TCF) sector as the leading branch of Kazakhstan's light industry has significantly lost its economic position in the period from 1990 to 2000 due to the crisis that followed the collapse of the Soviet Union. Till date, the sector has not recovered. In 2015, the three branches combined only contributed 1.2% to the total output of the manufacturing sector ([Textination 2016b](#)). One of the main causes for the sector's decline is the ongoing economic stagnation of the commodity sector which led to a loss of many domestic sources of high quality and well-priced raw materials and to a dependence on foreign suppliers ([Tulemetova et al. 2018](#)). In January 2018, domestic manufacturers matched 19.3% of national demand for hosiery and 16.9% for sportswear. Poor performance is observed in other segments, where production meets only 1-2% of the country's demand (Astana Times 2018). Further, the lack of skilled workers and the small domestic market present obstacles in the development of the sector. If the sector is to recover, however, the Special Economic Zone (SEZ) Ontustik in Shymkent could become an important center of the light industry ([Textination 2016b](#)).

Cotton is the main type of natural fibre, consumed by the domestic textile industry ([Tulemetova et al. 2018](#)) and occupies the position as the second most relevant agricultural export good of the country. During the first two months of 2018, Kazakh enterprises produced clothing worth 4.54 billion tenge (USD 13.89 million) demonstrating a 15.5% increase compared to the year before. The increase can be attributed to the Almaty region which experienced a strong development in the past year. The region hosts some of the country's biggest clothing producers, including Glasman, Arlan 777, Azhar, Mediatex-H and Textil Market. In particular knitwear production increased fivefold in 2018, while fur clothing production decreased by 8.5% and girls' outerwear by 19% ([Astana Times 2018](#)).

4.1.1.2 Leather sector

The Kazakh skins and hides often show insufficient quality in terms of structure evenness due to reasons such as intensive cattle growth, diseases, holes or spots obtained from infections and infestations, and are hence less popular on international export markets. Also, the number of cattle for leather has been falling. Poor management and a lack of financial investment are among the limiting factors of the sector. A large part of the leather is exported to Turkey and China due to low domestic demand ([leather international 2002b](#)). Export rates of the country regarding leather have been very unstable (2013 exports worth USD 5.1 million, 2014 only USD 1.2 million) ([Zhanakova 2016](#)). The export business with leather, however, is expected to decrease even more drastically as the Ministry of Industry and Infrastructure has declared a ban on raw cattle hide exports in 2019 for a period of up to 5 years. The action aims to keep value-adding processes within the country and create further jobs.

4.1.1.3 Silk sector

The Kazakh sericulture sector has almost entirely vanished since 2001. With the support of the Government some restoration initiatives of mulberry plantation in South Kazakhstan was carried out and

21,17-23,43 kg/box cocoons were produced with the aim to revive the sector. Another issue, however, is that the country lacks cocoon post-harvest processing facilities (Homidy 2013).

4.1.1.4 Cashmere sector

The Kazakh goat population has been rising since independence from the USSR, from 700,000 in 1992 to more than 2.5 million in 2007. It is estimated that there are currently around 2.64 million goats in Kazakhstan, of which approximately one third produce cashmere or cashgora (coarser fiber).

To increase down productivity, several cross-bred lines were developed using Russian, US and Asian cashmere goats with native goats. Some cross-bred lines with Angora have however proved unsatisfactory for the extreme climatic conditions of Kazakhstan.

Since 2000, enterprising Chinese and Turkish traders are purchasing raw cashmere from farmers and pastoralists in the remote regions of Kazakhstan. Farmers generally sell the whole-sheared fleece, including rough outer hair containing the cashmere down. Combing the cashmere out is preferable from a processing standpoint, as shearing fleeces reduces the length of the cashmere fibres and native Central Asian goats tend to have cashmere which is already rather short for processing. However, combing goat down is somewhat of a lost art in Central Asia. Traders and processors therefore have to manually sort and extract the cashmere from the whole-shorn fleeces.

Unfortunately, local village traders in Kazakhstan are often unaware of the difference between high and low quality goat fibre. They usually buy regardless of quality and sell to bigger traders who make much larger profits by sorting the cashmere before selling it to industrial processors ([Kerven et al. 2009](#)).

4.1.2 Consumer profile

The Kazakh consumer market is still very unexplored. A study about Kazakh women in urban areas has found that consumers are very value conscious and have specific opinions about a textile products' country of origin. Whereas Western brands are often perceived as particularly desirable, Kazakhstani women are wary towards products made in China ([Low and Freeman 2007](#)).

As wealth is pouring into the Kazakhstanian society from oil, gas and mineral deposits, cities like Almaty and Astana have become strong centers of retail in the Central Asian region where even luxury brands are available. Especially the younger generation which has few memories of Soviet times are contributing to an increasing consumption power ([Tulemetova et al. 2018](#)). Despite several barriers, such as lack of legislation and lack of public awareness, basic conditions for developing an internal market for sustainable products in Kazakhstan exist. A market research carried out by the Organic Center of Kazakhstan was able to prove a demand for organic products, however, restricted to the context of food. The majority of the survey participants were prepared to pay 10 to 30% more for organic products; 20% of the people answered that they were prepared to pay up to 50% more.

4.1.3 SCP framework

SCP policy	<p>A 2050 strategy towards a green economy exists and focusses on four areas:</p> <ol style="list-style-type: none"> 1) increasing the efficiency of use of resources (water, land, biological, etc.) and their management; 2) the modernization of existing and construction of new infrastructure; 3) Improving the well-being of the population and quality of the environment through cost-effective ways to mitigate the pressure on the environment; 4) Improve national security, including water security (Strategy 2050 2013).
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	<p>The government took efforts to address the growing global market of organic products by engaging in cooperations with European and Chinese partners in an attempt to introduce organic farming across the country. The Association of Organic Agriculture together with the FAO and the Kazakh Ministry of Agriculture developed a law on organic agriculture in 2015. The collaboration aimed to promote government policies to subsidize organic fertilizers, organic farming and organic certification (Small Grants programme 2016).</p> <p>In 2013, the Ministry of Environmental Protection together with UNDP developed a Concept of Transition towards a Green Economy until 2050. The concept has a special focus on sustainable energy security and aims to increase efficiency in resource utilization. It will be implemented in three stages. Between 2013 and 2020, the main priority lies on the optimization of resource use and increase of efficient environmental protection activities, as well as the establishment of green infrastructure. From 2020 to 2030 the concept aims to establish more green infrastructure, initiate the transformation of the national economy, oriented at rational water use and stimulation of renewable energy technologies, as well as the construction of facilities based on high energy efficiency standards. The period of 2030 to 2050 is aimed at further developing the national economy, which requires the use of natural resources on the condition of renewability and sustainability (Office of the President of the Republic of Kazakhstan 2013).</p> <p>In 2017, a roadmap for the light industry until 2021 was introduced by the Chamber of Entrepreneurs. As part of this roadmap, 35 projects worth 5 billion tenge are supported in order to contribute to the modernization and further expansion of the country's light industry (Atamekeh 2017).</p>
SPP/GPP	<p>Sustainable procurement has so far only been targeted for the areas of construction, IT and electronic materials by introducing a new amendment in 2019, following an assessment by the World Bank (Astana Times 2019). The current governmental procurement system does not cover procurement of all goods, works, and services using public funds, as there are separate procurement rules for the quasi-state sector. The lack of uniformity of the legal framework coverage complicates the adaptation of the procurement system towards higher sustainability and transparency (World Bank 2019b).</p>
Ecolabelling	<p>Currently, Kazakhstan does not have a national certification system for sustainable products. There are very few local private certification companies. Three European certification companies in Kazakhstan are accredited to certify products exported to international markets (Willer and Kilcher 2011).</p> <p>As part of the international conference 'Qazaq Organic Food', the Ministry of Agriculture declared the foundation of a branch of the international certification body Organic Standard Ltd in order to scale up certification of organic products (APK Inform 2019). The body covers, amongst others, unprocessed plant and animal products (IOAS Organic Accreditation Service 2018).</p> <p>An environmental code ST RK 1618-2007 stipulates the basic provisions for the product labeling of 'ecologically clean products'. These eco-products are defined by the code as products that have beneficial effects on the environment, public health, and biological resources. Ecologically clean production does however not correspond to international understanding of organic production (Willer and Kilcher 2011).</p>

Sustainable SMEs

When meeting certain criteria, tax benefits are available for SMEs in order to support their development. Companies with an income not exceeding USD 173,961 in a financial year and employing less than 30 individuals are entitled to pay corporate income tax as well as social tax at the aggregate rate of 3% of their income ([Baker McKenzie 2018](#)).

4.1.4 Key SCP related initiatives

The Organic Centre of Kazakhstan was founded in 2008 based on a cooperation between the Foundation for Integration of Ecological Culture (FIEC, Kazakhstan) and the Agro Eco Louis Bolk Institute (The Netherlands) with financial support from the European Commission ([Willer and Kilcher 2011](#)).

Long-term funding for SMEs in Kazakhstan and finance projects involving climate change adaptation and mitigation, as well as environmental protection are set to be more available, as the European Investment Bank (EIB) has signed two financing contracts for EUR 150 million and EUR 50 million respectively ([Blue & Green Tomorrow 2016](#)).

EBRD seeks to support Kazakh clothing producers by investing USD 1.5 million in the sector and cooperating with 70 textile companies ([Astana Times 2018](#)).

The OSCE (Organization for Security and Cooperation) Centre in Astana has attempted to promote green growth and sustainable development principles in Kazakhstan ([Blue & Green Tomorrow 2016](#)).

In 2017, the EXPO was organized in Astana under the theme of 'Future Energy'. The event drove forward the host country's efforts to adopt more sustainable practices and created additional opportunities for progress towards a more environmentally sustainable economy as well as renewable energy ([Organization for Security and Co-operation in Europe 2018](#)).

4.2 Kyrgyzstan

4.2.1 Sectoral profile**4.2.1.1 Textile and RMG sector**

The Kyrgyz textile and garment industry originally developed in the 1930's due to the rich availability of raw materials of mainly cotton and wool in South Kyrgyzstan. Nowadays, over 90% of raw cotton sourced in Kyrgyzstan is exported directly to China. The garment industry has traditionally been of major importance to the country, with nearly 7% of the nation's working-age population employed in the sector. According to estimations, the sector employs around 300,000 working individuals, with a large part of total employment in the industry on an informal level.

Survey respondents of an ILO study stated that the garment industry consists of around 300 mid-sized (50-80 employees) and around 1500 small-scale (5-15 employees) enterprises ([ILO 2012](#)). The biggest textile and apparel cluster is concentrated around Bishkek where 96% of the sector's companies are located. The cluster predominantly consists of micro and small enterprises, with some medium and large firms. Of the 740 officially registered enterprises in apparel, 87% are registered as sole proprietorships. However, it is estimated that there are also several thousand informal enterprises in business, making up 60-80% of companies in the cluster ([Birkman et al. 2012](#)). A majority of employees and business owners (70-85%) are women and more than half (57%) of the workers in the garment sector come from rural areas ([ILO 2012](#)).

According to estimates by one of the largest Kyrgyz garment and textile producer associations, Legprom and Souztextil, the contribution of the sector to GDP ranges from 5 to 15%. Exports increased ten-fold, from around USD 15 million in 2003 to \$155 million in 2012, with Russia and Kazakhstan being the main export destinations. According to the same source, garment production constituted more than 80% of light industry production, with over 3,000 SMEs exporting more than 90% of their production to Russia and Kazakhstan in 2012 ([Jenish 2009](#)). A large proportion of the recent upswing has been triggered by the domestic sewing industry, which employs approximately 150,000 people, the majority of which work in MSMEs ([ILO 2012](#)).

After years of producing for the bazaar trade without large-scale orders, Kyrgyz garment manufacturers are now beginning to fulfill CMT contracts with fabric and fixtures provided by clients, with only a few advanced firms involved in design, branding and production ([ILO 2012](#)). Kyrgyzstan's inexpensive, trainable labour and low energy costs are an advantage for the growth of the RMG industry. However, due to the absence of thread production in the Kyrgyz Republic, the textiles and wearing apparel production chain is fragmented. The whole buying and importing process of thread is logistically complex and costly, which is currently destabilizing the sector ([ILO 2012](#)).

The Kyrgyz government is aiming to bring new investments into the sector. But the slow pace of reforms may not be enough for the sector to compete considering the rush of Chinese goods on the New Silk Road ([Dsouza 2018](#)). Some signs are already visible, since a very large part of Kyrgyzstan's apparel exports are fuelled by Chinese apparel. Although Kyrgyzstan still finds a huge market for apparel in neighbouring Russia and Kazakhstan, these garments are often not even manufactured in Kyrgyzstan but imported from China and re-exported by Kyrgyzstan. In particular, Dordoi and Kara-Suu markets are the major trade centres specialising in re-exports of goods (textiles and apparel) from China to Tajikistan, Uzbekistan, Kazakhstan and Russia, and are especially important for employment and income generation of Kyrgyzstan ([UNIDO 2018a](#)).

Even the domestic demand is to a large extent fulfilled by apparel imported from China. Besides China, Kyrgyzstan is furthermore struggling to compete against bigger, formal players like Bangladesh, India and Turkey, who have a more diverse range of qualities and products to offer ([ILO 2012](#)). Thus, value chains in the cotton industry remain severely underdeveloped, with negligible value added within the country's borders.

4.2.1.1 Leather sector

Kyrgyzstan's most relevant leather trading partner is Tajikistan, with Kyrgyzstan accounting for 35% of Tajikistan's imported leather goods. Leather and textile companies in various regions of the country are, however, suffering from the absence of financing and the lack of a market for their products ([Leather International 2002a](#)). Outdated, energy-intensive equipment is generating great amounts of industrial waste, in particular chemical waste from tanneries, such as chrome, sulfide and nitrogen. The waste streams also have a particularly high concentration of Biological Oxygen Demand (BOD), high concentration of suspended solids, dissolved solids, oils and grease. If available, wastewater treatment units of most of the companies are outdated, and the treated water does not meet the discharge standards. Environmental issues are not a relevant concern for many companies who prefer paying fines over introducing proper wastewater treatment plants ([Asipjanov 2004](#)). Products are not perceived as competitive, neither in the domestic nor in the global market ([International Institute for Applied System Analysis 2018](#)). The share of women working in leather and footwear manufacturing is estimated at 30% ([UNIDO 2018a](#)).

4.2.1.2 Silk sector

Since 2001, the Kyrgyz sericulture sector has almost entirely ceased to exist. Over the past years, the output of the country's silk production reached a near zero level ([Homidy 2013](#)) even though the climatic conditions of Kyrgyzstan would allow growing high-quality natural silk. The defect rate used to be quite low, according to experts, who are determined to revive the silk production industry in the Kadamzhai district of Kyrgyzstan. Kyrgyz and Uzbek producers have concluded recently an agreement, according to which the Uzbek producers will buy silk cocoons grown by Kyrgyz farmers in the future ([Kazakh TV 2019](#)).

4.2.1.3 Wool sector

A World Bank review of Kyrgyzstan notes that the livestock sector “contributes substantially to the national economy by providing high value food, income, employment and foreign exchange” ([Kerven et al. 2011](#)). Covering 44% of the country's total land area and 86% of all agricultural land, pastures are much more abundant in the Kyrgyz Republic than arable land. Availability of wide areas of natural, mainly low grass mountain rangelands was the precondition for the development of sheep production in Kyrgyzstan as the major and traditional sector of livestock production ([Sherzod 2009](#)).

The goat population in Kyrgyzstan was 850,000 in 2007. However, a recent small sample assessment in 12 villages in two districts of southern Kyrgyzstan (Osh province) indicates that goat numbers are between three and five times higher than official district counts. Local village officials and farmers in this study region acknowledge that village goat populations are routinely under-enumerated, as farmers have to pay a higher head tax per goat compared to sheep ([McGregor et al. 2009](#)). Goats in Kyrgyzstan vary from Cashmere and Angora types, to Saanan milking goats, and the Kyrgyz ‘local’ goat for meat.

In springtime, the goats naturally moult their warm inner winter coats. Before this happens, their owners shear them and sell the fleeces to local town traders. The buyers buy fleeces by weight, in recent years paying a pre-set uniform price of \$5–25 per kilogram regardless of quality, with no extra for ultra-fine or white fibre. These traders then sell the unsorted fleeces to mainly Chinese wholesalers who hand-sort them into quality lots, each with a different price, before selling them on to factories in China, Turkey or elsewhere for processing. Buyers from China and other countries started coming to Kyrgyzstan in the late 1990s to buy cashmere from farmers and pastoralists.

Producers and local traders are unfortunately unaware of the market value of what they sell to wholesalers and are not paid according to quality. The wholesalers' dominance in the market has led to a situation in which pastoralists and local traders have few options but to sell to them at the prices they set. With no incentive to produce better-quality fibre, many livestock keepers have crossbred their local animals with Pridon and Angora goats, which were introduced to collective farms in the north of the country during the Soviet era. They produce more fibre, but of a lower quality. As a result, the reputation of Kyrgyzstan goat fibre is decreasing, as the few European buyers who trade in northern and central Kyrgyzstan are increasingly offered coarse, low-quality “cashgora” from the Pridon crosses ([Kerven and Toigonbaev 2010](#)).

Since 2010, the agricultural suppliers for woollen garments almost completely reoriented their activities to the release of semi-coarse, coarse, and semi-fine wool. Of the total volume of wool cut in recent years, the share of fine merino wool was 20-25%. Local producers can thus only avail of very small reserves of fine merino wool. In general, it has become unprofitable for farmers to develop merino sheep breeding, which is not a focus of public support. The deterioration of the quality of wool also affected the quality of woollen yarn for knitwear enterprises, in turn affecting the competitiveness of knitted clothes ([Kerven and Toigonbaev 2010](#)). A study from 2014 found that Kyrgyz cashmere had significantly shorter staple length compared to for instance Uzbek cashmere ([Iñiguez et al. 2014](#)).

There are programs for importing cashmere goats from Mongolia to breed with Kyrgyz goats, but unless some discipline is instilled into the Kyrgyz programs, the genes of imported goats will be lost in the current goat population, producing no long-term effect ([van Gelder 2003](#)).

Main problems of the Kyrgyz wool sector can hence be found in 1) the disparity of prices for agricultural products, 2) the lack of a developed fiber marketing system, 3) the collapse of the fiber processing, 4) the lack of access of farmers to fiber market information, 5) the lack of scale breeding programs directed to improvement of fiber quality, 6) low technological characteristics of fibers, and finally 7) the lack of production and economic conditions in households for value addition to fiber ([Sherzod 2009](#)). Another observation of empirical literature suggests that social, cultural, political and economic trends are increasing the role and responsibilities of women in the practice of agro-pastoralism without a similar increase in women's rights of access, ownership, and decision-making authority regarding agro-pastoral resources ([Kerven et al. 2011](#)).

4.2.2 Consumer profile

Kyrgyzstan covers 198,500 km² of Central Asia, bordered by China, Tajikistan, Uzbekistan, and Kazakhstan. With a population of only 6.2 million people, it is the least populated country in this list. The landscape is mountainous with mineral and water resources. Under heavy winter conditions, highways over passes are forced to close and miners contend with glacial flows. Slightly over a third of Kyrgyzstan's population lives in urban areas. Agriculture is the main source of employment (48%), followed by industry employing 12.5%, and the service sector providing jobs to 39.5%. Gold is the most important export product, and oil the largest import product ([Birkman et al. 2012](#)).

An estimated 75% of Kyrgyz imports from China are re-exported to neighbouring countries with substantial amounts destined for Russia. The remaining imports are consumed domestically or used in local production of clothing in value-added activities. Foreign trade in the Central Asian economies goes through three main channels: formal or standard trade; large bazaar trade; and cross-border trade. Since the last two often go unmonitored and unreported, it has become very difficult to measure the true extent of Kyrgyzstan's trade ([Birkman et al. 2012](#)). According to estimates, almost 60% of Kyrgyz trade takes place in the informal sector.

Current challenges for organic agriculture development include low consumer awareness as well as lack of legal framework, shortage of local study programs and thus specialists in organic agriculture and lack of certification knowledge among farmers ([Otunchieva 2019](#)).

Russian and Kazakhstani consumers seem to have similar taste in clothing, which differs from that of Tajik and Uzbek consumers. Industry representatives claim that this is one of the reasons why a majority of Kyrgyz clothing is exported to Russia and Kazakhstan, because wholesale sellers know their markets, through the presence of relatively large Kyrgyz diasporas in these countries ([Birkman et al. 2012](#)).

4.2.3 SCP framework

SCP policy

The redevelopment of the textile and apparel cluster after the collapse of the Soviet Union occurred in a nearly 'policy free' environment. Since the 1990s, the government has taken a more supportive and active role in bringing legislation forward and investments into the textile and RMG sector. The development and implementation of reforms, however, have been very slow ([Dsouza 2018](#)).

A subsidy programme worth 700 million Som for the agro-food sector was implemented, and the Ministry of the Economy earmarked 350,000 million Som for an interest subsidy programme targeted at export-oriented firms, including textile and garment producers. The programme forms part of the National Export Promotion

	<p>Strategy for 2018-2022 (UNIDO 2018a).</p> <p>Following a National Sustainable Development Strategy for 2013-2017, a plan for 2018-2040 has been introduced in accordance with the SDGs. Ensuring macroeconomic stability and the development of legal institutions is considered to be the main prerequisite of the plan (National Council for Sustainable Development of the Kyrgyz Republic 2018).</p>
SPP/GPP	<p>In a presentation on SPC, as part of a Green Economy week held in Kyrgyzstan, the State-Secretary of the Ministry of Finance noted, that SPC has already been identified as a priority. The topic is also touched upon in the National Sustainable Development Strategy for 2040. A project on Strengthening Sustainable Public Procurement for the Regional Transition to an Inclusive Green Economy is currently ongoing (Partnership for Action on Green Economy 2018).</p>
Ecolabelling	<p>Currently, there is no integral sound concept for the development of environmental certification in the country, which would include legislative and regulatory principles, organizational and economic mechanisms, as well as environmental justification (Global Biodiversity Finance Initiative 2018). According to the Kyrgyz Centre for Accreditation under the Ministry of Economy, some international and national schemes for voluntary environmental certification are already being implemented and applied in Kyrgyzstan.</p> <p>The uptake of organic labels in cotton production is currently hampered by a lengthy certifying process (Swiss Info 2003).</p>
Sustainable SMEs	<p>Kyrgyzstan's tax policies incentivise small companies. However, Kyrgyz firms operate in a complex regulatory environment that is time-consuming and costly to comply with. Once they attain a certain size, companies are burdened with taxes and audits encouraging pay-offs and bribes. Since the regulatory environment and the costs of administrative burdens increase with firm size, firms have a strong incentive to stay small and forego any opportunity for growth. As soon as companies grow above 30 employees, they “<i>immediately face higher payments and a more cumbersome payment procedure</i>”. This environment hence strongly discourages growth of companies (Eurasianet 2012).</p> <p>Especially in the Kyrgyz wearing apparel industry, the extent of regulatory burden is relatively high. Kyrgyz firms highlight three key application obstacles, which keep them from applying for bank loans or credits, namely unfavourable interest rates, complex procedures and high collateral requirements. In 2011, Kyrgyz firms in the wearing apparel industry quoted unfavourable interest rates as the most important reason for not applying for credits, which helps to explain why Kyrgyz wearing apparel firms abstained from applying for credits in the first place (UNIDO 2018a).</p>

4.2.4 Key SCP related initiatives

The Union of Textile brings together 32 entities and focuses on improving the local conditions of the sector. There are two associations in the garment industry at present: Legprom for garment enterprises and Soyuztextile uniting knitwear-making and garment enterprises. Legprom counts 400 large, medium and small garment sector enterprises as its members and Soyuztextile 26 enterprises ([ILO 2012](#)).

JSC OKKO is one of the five leading leather enterprises and incorporates one of the oldest leather associations in the Kyrgyz Republic ([Asipjanov 2004](#)).

USAID collaborated with Kyrgyz SMEs in the garment and apparel industry to increase their export potential. Through this cooperation, Kyrgyz apparel manufacturers have undergone BSCI social and labour audits and certification, enhanced their quality control systems and expanded their base of suppliers. As a result, they were able to attract new buyers including international retailers from Europe in addition to their traditional Russian and Kazakh clients ([Dsouza 2018](#)).

The Kyrgyz Government in collaboration with GIZ, ADB and ITC joined efforts to promote the Kyrgyz textile and RMG industry. A National Strategy for the Textile Sector was developed by this collaboration aiming to strengthen industry competitiveness in international markets and the expansion of markets of product distribution. A competency-based modular sewing training curriculum was offered by ADB at 25 lyceums throughout Kyrgyzstan. In addition, ITC provided a series of training programmes and advisory services to assist companies in their transition to production systems with higher value-added steps and attract larger orders as well as new customers ([Jenish 2014](#)).

Dutch-Kyrgyz collaboration work together with Siro, a company that produces leather goods made in Kyrgyzstan from local leather ([Siro 2019](#)).

An important funding source is the Russian-Kyrgyz Development Fund (RKDF), which offers medium to long-term concessional loans at interest rates between 4 and 5% to firms in priority sectors, such as the light industry. As of August 2017, 761 projects worth USD 246 million have been approved, predominantly in agriculture and the manufacturing industry ([UNIDO 2018a](#)).

In 2017, United Nations Economic Commission for Europe (UNECE) launched a project for an international framework initiative on transparency and traceability for sustainability in the textile and leather sector. This initiative provides an opportunity for the Kyrgyz textile industry to improve its access to the high-value European markets for so-called 'clean clothes' by preparing the ground for the verifiable enforcement of environmental regulations ([Palacin 2019](#)).

The Swiss initiative Helvetas has supported Kyrgyz farmers to grow organic cotton destined to be sold to Switzerland by providing them with information and trainings ([Helvetas 2019](#)) ([Swiss Info 2003](#)).

The EU has funded over half a million euros in order to improve environmental standards in the textile industries in Kyrgyzstan ([Palacin 2019](#)).

4.3 Tajikistan

4.3.1 Sectoral profile

4.3.1.1 Textile and RMG sector

The textile and RMG sector (excluding cotton exports) account for almost 3% of Tajikistan's total exports (2015) and up to 20% when cotton fibre is included ([Kamolov 2019](#)).

Tajikistan produces roughly 400 thousand tonnes of cotton per year with a fibre length of around 28 to 31 mm, mainly in the southern Khatlon region and northern Sughd region. The cotton has a high level of fineness and is adequate to produce yarn ranging from 24 Ne to 40 Ne. As such, it is highly sought after by cotton importers from countries such as Turkey, Russia, and China. While the majority of the cotton is exported unprocessed, about 10% is processed locally, serving as the main raw material for the domestic spinning industry ([Schweizerische Eidgenossenschaft et al. 2016](#)).

The textile industry consumes a considerable amount of water resources in the dyeing and finishing processes. Outdated dyeing methods moreover release chemical waste, including Persistent Organic Pollutants (POPs), into water streams. Even though less pollutant and resource intense methods, such as air dyeing and improve wastewater management techniques, exist these methods find no application

since stakeholders do not consider the issue to be a major concern. There is no awareness of the benefits from transitioning to a more sustainable process ([Schweizerische Eidgenossenschaft et al. 2016](#)).

4.3.1.2 Silk sector

Sericulture is one of the most ancient branches of the Tajik economy. Growing silkworm eggs and collecting the cocoons still mostly occurs on a micro-scale within family households. Every year around 60,000 households are actively engaged in silk growing ([Black Caspian Seas and central Asian Association 2005b](#)). 52 - 55% of cocoons are produced in the northern part of the country, in the Sagdian region, while the rest (35-38%) comes from the southern part of the country, mainly the Khatlon region ([Homidy 2013](#)).

According to estimates, there are about 60 enterprises active in the processing of silk cocoons including cocoon drying enterprises, silkworm egg factories, silk reeling factories and silk weaving businesses ([Black Caspian Seas and central Asian Association 2005a](#)). Tajikistan has two silkworm production factories: Dushanbe SGF with a production capacity of more than 55,000 boxes/year and Khojent SGF generating 52,000 boxes/year. More than 70 % of the necessary amount of silkworm eggs, however, are imported from China ([Homidy 2013](#)). Silk accounts for about 1% of exported goods ([Asian Development Bank 2010](#)). The Tajik Silk association was established by the Ministry of Industry in 2004.

4.3.1.3 Cashmere and wool

Tajikistan experienced a drop in both sheep and goat populations in the troubled period of the 1990s, with both populations now rising since 2002 as the national economy improves. The goat population has increased by 75% between 1997 and 2011. In a UK based survey of 2003, samples were taken of Tajik goat down from six districts in the mountainous regions of the Rasht Valley and Gorno Badakhshan. The quality of the samples from the districts of Jirgital, Tojikabod, Rasht and Vanj were very fine, on average from 14 to 15.3 μm . Most of the samples from the two other districts of Murgab and Shugnon in Gorno Badakhshan province however did not meet the International Fine Cashmere Standard. A household surveys found that among the poorest households goats are the dominant flock species. As goats are browsers and can forage on bushes and a wider variety of plants than for instance sheep, goats can be kept in the high mountain pastures for longer periods ([Kerven et al. 2009](#)).

4.3.2 Consumer profile

Expenditures for clothing have been strongly increasing between 2010 and 2014. This period was followed by a sudden drop due to a crisis the country faced in 2015. From USD 355 million spent on the apparel market, the number has stagnated at USD 240 million in 2018. Per capita expenditures on clothes have been USD 27 in 2017. The segment of European apparel has a market volume twice as large as the market volume of national traditional clothes ([Schweizerische Eidgenossenschaft and International Trade Centre 2019](#)). Domestic products generally struggle to compete with cheap imports from China, Uzbekistan, Turkey, and Pakistan.

Tajikistan imports a variety of textiles and garments to fulfil domestic needs. Textiles and garments were the country's major imports during 2014 accounting for 17% of the import bill ([Asian Development Bank 2016](#)). Only 10.5% of Tajik apparel is sold on the domestic market. 90% of this is sold to local retail and outlet stores, while the remaining 10% is bought for state procurement purposes ([Asian Development Bank 2016](#)).

Given that agriculture is a major source of employment (more than 40%) in the country, low productivity and meagre earnings from agriculture are major causes of poverty and low consumption power in rural

areas. Official statistics show a share of employment of only 15% in the villages, whereas in the urban centre, 45% of the working-age population is registered as employed^{1.0} About 17% of the households supplement their livelihoods with informal jobs, and 21% receive remittances from household members who out-migrated in order to seek employment. More than two-thirds of the Murghab households spend less than the 400 TJS (37€) necessary for minimal needs per month ([Republic of Tajikistan 2007](#)). 10% who have at least 1,000 TJS (93€) at their monthly disposal can afford sufficient amounts of consumer goods. Only 2% of the population, with more than 2,000 TJS (185€), can purchase everything they desire every month ([Republic of Tajikistan 2007](#)) ([Kreutzmann 2012](#)).

4.3.3 SCP framework

SCP policy

In the national development strategy up to 2015, the government stated: *“Serious problems have emerged in cotton production, an area in which the country has traditionally specialised. These problems are linked to an extremely inefficient mechanism for the financing and sale of cotton, which has led to an increase in debt among cotton farms. The situation is also aggravated by excessive regulation of production and sales, deficiencies in the production financing methods that are employed, too much interference by government authorities and poor protections for the owners, as well as the low yield of raw cotton and inefficient cotton ginning operations”* (p.21)⁵.

As specific priority of the country the private sector in rural areas is supposed to be strengthened by improving the efficiency of cotton production and resolving the problem of cotton debts ([Republic of Tajikistan 2007](#)).

Since independence, the government provided various types of support to the textile sector. Two programs were established: the Cotton Fibre Processing Program (2007-2015) and the Light Industry Development Program (2006-2015). The former aimed to increase cotton fibre processing in order to provide inputs for the light industry. The goal of the latter was to increase processing and to boost textile and RMG exports through improvements across the value chain, support network, and regulatory environment.

A number of measures have been taken to develop Tajikistan’s RMG sector. As part of the governments support to the sector and its goal to strengthen the RMG sector in particular, it granted a 12 year tax exemption to enterprises that vertically integrate by 2015, transforming domestic cotton into finished textile and garment products ([Schweizerische Eidgenossenschaft et al. 2016](#)).

In order to establish cotton processing enterprises, Governmental Decree No. 392 of 3 August 2007, On the Programme for Full Processing of Cotton Fibre Produced in the Republic of Tajikistan until 2015, was adopted ([International Monetary Fund 2010](#)).

	<p>A development programme for 2030 aims for development of agro-industrial clusters and enterprises for complete processing of cotton fibre, leather, silk cocoons, and other agricultural products (Executive Office of the President of Tajikistan 2016).</p> <p>In addition, Tajikistan adopted a SDG agenda for 2030 focussing on national strategic goals for the development of the country. These include mainly: (1) ensuring energy security and efficient use of electricity; (2) overcoming communication deadlock and transforming Tajikistan to a transit country; (3) ensuring food security and access of population to quality nutrition; and (4) expansion of productive employment. In order to achieve SDG 8 (Decent Work and Economic Growth), Tajikistan sets the objectives in its National Development Strategy 2030 that encompasses expanding targeted territorial employment, effective short-term employment programs especially for young people and women, assistance in the retraining of migrants, as well as the formation of employment centres with the development of social contract technologies, and enhanced development of the industrial sector (Mamadov 2017).</p>
SPP/GPP	<p>Under the Lot Purchase of Uniforms, Accessories, Shoes, Stationery, Household Goods and Soft Equipment as part of the list of goods under the Tajik agency for public procurement, sustainability aspects are currently not taken into consideration (Agency for State Procurement of Goods, Works and Services under the Government of the Republic of Tajikistan 2019).</p>
Ecolabelling	<p>According to the ITC, the EU Ecolabel which covers a wide range of products including textiles is being implemented in Tajikistan (ITC 2018).</p>
Sustainable SMEs	<p>Entrepreneurial activity is hampered by state interference, increasing regulatory costs and uncertainty through various bureaucratic impediments (The Heritage Foundation 2019).</p>

4.3.4 Key SCP related initiatives

A wide range of interventions are currently being implemented in initiatives promoting sustainable development. These projects are cross-sectoral and address various constraints at SME level, in the Tajik regulatory framework, as well as in the business environment ([Schweizerische Eidgenossenschaft et al. 2016](#)).

The ITC and IPI (Swiss Federal Institute of Intellectual Property) contributed to the sustainable expansion and diversification of SME's exports through increasing the competitiveness of the textile and RMG industry and improving the quality management infrastructure of the country ([Schweizerische Eidgenossenschaft et al. 2016](#)).

The EU project Handicraft and Business through Regional Integration and Fair Trade Market aimed to contribute to the development of the Tajik private sector with a special focus on regional integration of the handicraft sector. A specific objective was to reinforce the representative role, the sustainability and the competences on supporting SMEs of Tajik and Kyrgyz Handicraft Business Intermediary Organizations (BIOs).

UNIDO has been active since 2017 and provides technical assistance to increase productivity and boost exports in the carpet weaving, embroidery and textile sector following a government program for the period of 2014-2020 that aimed to create new employment opportunities in carpet weaving ([UNIDO 2015](#)).

A project initiated by ITC will assist Tajik TISIs to improve and sustain their operational and managerial capacities further to offer a wider range of quality services to SMEs in the textile and RMG sector ([Schweizerische Eidgenossenschaft et al. 2016](#)).

4.4 Turkmenistan

With a population of 5.9 million people, Turkmenistan is the least densely populated of the Central Asian countries. Its role along the Silk Road has formerly been to serve as an important corridor for commercial exchanges. Its main trade partners today are mostly in Asia and Europe. The largest shares in foreign trade turnover belong to Iran (21.7%), Russia (18%), Turkey (16.4%) and China (10.8%) ([Jumayev 2012](#)).

Since gaining independence, Turkmenistan has faced some economic changes and has kept an adequate level of irrigated agriculture to ensure food security, generate revenue and provide workplaces to the population. The structure of the industry in Turkmenistan by volume of production is dominated by the energy and oil sector accounting for 74.3% followed by the food (11.3%) and the light industry sector (9.4%) ([Jumayev 2012](#)).

The country has a great water resources scarcity problem as the Karakum Desert covers around 80% of the country's surface and many populated areas are located far from larger water bodies ([Jumayev 2012](#)).

4.4.1 Sectoral profile

4.4.1.1 Textile and RMG sector

The textile industry is the second most important branch of industrial production in Turkmenistan and especially the cotton textile industry represents an important economic foothold. After cotton exports, textile apparel and knitted goods are the second and third strongest textile export goods ([Jumayev 2012](#)).

In the period of 1980-1990 the production of cotton was rather stable and declined after the dissolution of the USSR because agricultural programs shifted production away from cotton to wheat in order to guarantee the country's food security. Despite this decline in cotton production, Turkmenistan remains a significant cotton producer in the Central Asian region ([Zvi Lerman et al. 2012](#)).

The industrialization during the Soviet time had furthermore lead to many ecological problems caused by a cotton industry based on monoculture, undeveloped processing industry, mismanagement of water resources and obsolete machinery posing additional difficulties to the sustainable industrial development ([Kim 2012](#)).

The share of cotton fibre in exports has been unstable and decreased from 19.7% in 1996 to 4.6% in 2010. This is partly due to the development of the textile manufacturing industry of interim finished goods. Today, the majority of raw cotton is processed domestically. Before independence, almost all cultivated cotton was exported for the further processing to enterprises in Russia, Belarus, Ukraine or other mostly Baltic countries. The amount of seed cotton processed in the country accordingly rose from 2-3% before independence to 35% in the year 2000.

The textile industry on the other hand achieved a rapid progress over the last years. It became one of the most export-oriented economies of the country for both textile and RMG products. More than 70% of cotton production, such as cotton fibre, denim (jeans fabric), terry towelling fabric, stockinet material, sateen (glazed cotton), printed cotton, ready-made apparel and terry production, is exported ([Kim 2012](#)).

The products manufactured in Turkmenistan include a wide range of yarn and fabrics, as well as an extensive range of finished products. The manufacturing of fabrics gave a powerful impetus to the development of the sewing and knitting sectors of the national textile industry. A major reconstruction of the country's garment factories led to an increased output of RMG. The upgraded production basis of the industry accounts for about seven dozen facilities, including cotton spinning, weaving, sewing and knitting and silk plants. Up to 118 thousand tons of cotton yarn and 178 million square meters of fabrics are manufactured per year ([Turkmenistan Info 2017](#)).

At present, the industry operates 85 facilities where the production of cotton, mixed yarn and fabrics, readymade terry, sewing and jeans garments takes place. In addition, there are silk processing and shoe factories, as well as plants for initial leather processing. The Turkmen textile industry also inherits one of the largest pneumatic spinning mills in Central Asia. The USD 22.7 million plant has a capacity of 4,872 tons of worsted yarn and 275 tons of ring yarn, half of which is destined for export ([Turkmenistan Info 2013](#)). Around 30,000 people work in the industry as a whole ([Turkmenistan Today 2019](#)).

Turkey is an important economic partner as Turkmen-Turkish joint ventures are controlling around 90% of the country's textile industry ([Kuzmina 2012](#)). Besides Turkey, which is also the primary importer of Turkmen textiles, the EU is also a relevant partner for trade of textile products. In 2010, the country exported 52.3% of cotton fibre and 32.7 % of textile products to European countries ([Jumayev 2012](#)). More than 60% of produced textile production is exported to the USA, Canada, Russia, Western Europe, Turkey, Hungary, China, India, the Baltic states, Ukraine and others ([Turkmen textile 2019](#)).

Innovative textile factories are appearing in Turkmenistan, such as a facility for textile waste processing with a capacity of 5,000 tons of regenerated fibre per year which has been established on the basis of the Ashgabat textile complex ([Turkmenistan Info 2017](#)). The production capacity was based on an assessment of the total volume of wastes produced in textile facilities in the country. The waste regeneration facility, decreased material expenses significantly and targets the high demand of regenerated fibre material of foreign countries like Turkey, China and others ([Turkmenistan Today 2019](#)).

4.4.1.2 Leather sector

Traditionally, livestock breeding has been a highly developed sector in Turkmenistan. Modern technologies of processing have been added to century-old agricultural farming practices. In 2017, Turkmenistan exported 20.8% more leather raw material, compared to 2016.

The Turkmen joint stock company Maksat Deri, which is specialized in leather production, recently signed agreements with Italian companies on the purchase of modern advanced equipment, which will allow an increased volume of products to target export markets. Currently, the company produces 10,000m² of natural leather per year, most of which is purchased by the Turkmen footwear enterprise Rovshen. Parts of the material volume is also sent to textile factories, where it is used in various applications ([Chamber of Commerce and Industry of Turkmenistan 2018](#)).

4.4.1.3 Silk sector

Silk production is another priority area of the Turkmen textile industry, which is currently under revival. Measures to increment the volumes of silk cocoon production and the full provision of profile processing complexes with valuable feedstock and their modernization are being undertaken.

Leading silk facilities, like the Ashkhabad Silk Factory and Turkmenabat Silk Production Association, were completely reconstructed with modern equipment. The facilities produce raw silk, silk yarn and a wide variety of fabrics that meet international standards ([Turkmenistan Today 2019](#)). Much of the silk manufacturing equipment in the most modern factories was imported from China. China provided two million dollars interest free credit for reconstruction of the Ashkhabad Filature that now has eight

production lines and 5,000 employees working with modern equipment producing 260 tons of silk yarn annually.

The need for silk for the domestic market is large, especially in Ashkhabad, as locals use it to make traditional clothing. The silk production is not only meeting local demand, but has also entered foreign markets, such as South Korea, Iran, India and Dubai ([Yarns and Fibers 2015](#)).

4.4.1.4 Wool sector

Wool is mainly used for traditional ornamented and modern carpet items. The modernization of wool processing factories and the improvement of production capacities of clusters has contributed to the development of strong flexible yarn production facilities that mainly use sheep wool of the Saraja breed. The Argach Wool Spinning Mill, which is able to produce up to 500 kg of pure wool yarn including 250 kg of dyed yarn due to technical modernization, is a specialized facility in this regard. A significant part of the produced goods addresses demands of the domestic market while another part is exported ([Turkmenistan Today 2019](#)).

4.4.2 Consumer profile

The development of the Turkmen consumer market is characterized by increasing purchasing power as shown by the rapid growth of per capita retail turnover. Price levels are driven by the insufficient supply of domestic consumer goods on the retail market (despite adequate capacity and resources for production of such goods inside the country), as well as large numbers of intermediaries between producers and consumers ([UNDP 2010](#)). Due to investments into the construction of new high-tech enterprises with the support of foreign partners, the demands of the domestic market can be widely met with a variety of products ([Turkmenistan Info 2017](#)).

Particularly in the light and the food industry consumers are seeking to buy imported goods which emphasizes the low competitiveness of some domestic consumer goods. This situation currently hinders the development of domestic consumer goods production, since a large share of the population's disposable income effectively leaves the country ([UNDP 2010](#)).

4.4.3 SCP framework

<p>SCP policy</p>	<p>The Ministry of Textile Industry of Turkmenistan was established in 1995. Its main strategy is the introduction of new technologies, and putting efforts in the development of quality and compliance of the production with the requirements of ecological safety (Inter Turkmen Trade 2019).</p> <p>The achievement of SDGs of Agenda 2030 are part of the National Programme for Social and Economic Development of Turkmenistan (until 2030) and the Programme of the President of Turkmenistan for Social and Economic Development (period 2019-2025). The programme entails an integrated and multisectoral approach to sustainable development through socio-economic policies, prevention of climate change impacts, environmental protection and biodiversity, as well as institutional reforms. Strategies to achieve SDGs have further been integrated into relevant national strategies begun since 2016. The State Statistics Committee of Turkmenistan (TurkmanStat) is in charge of implementation, monitoring and reporting (Government of Turkmenistan 2019).</p>
<p>SPP/GPP</p>	<p>The Law of Turkmenistan On Tenders for Delivery of Goods, Performance of Works, Rendering Services for the State Needs, the so-called Law on Tender, was last revised</p>

	in June 2018. The Law targets the efficient use of public funds and fair competition through transparency, openness and efficiency of tender procedure implementation. It is further supposed to enhance the participation SMEs in tenders and to increase the responsibility of suppliers regarding contract fulfilment. 'Sustainable' or 'green' regulations or proceedings have not yet been considered (Chambers and Partners 2019).
Ecolabelling	Leading enterprises of the sector, such as Turkmenbashytextile Complex, Turkmenbashy Jean Complex and the cotton-spinning factory Serdar in the Kaka settlement, obtained the certificates ISO 9001 and 9002 System of Production Management and Quality Control, ISO 14001 Environmental Protection, and OHSAS 18001 Labor Protection and Safety Engineering (Turkmen textile 2019).
Sustainable SMEs	<p>A new focus on diversification and encouragement of SMEs has recently emerged.</p> <p>The national law On State Support for Small and Medium-sized Business, which was passed in August 2009, has been intended to provide a firm basis for promoting the growth of employment levels and personal incomes in the medium and long term through the development of the SME sector (UNDP 2010).</p> <p>In 2018, the President of Turkmenistan signed the Resolution approving the State Program for the Support of Small and Medium-sized Entrepreneurship in Turkmenistan for 2018-2024 and a plan of activities for this period. It was mainly introduced to successfully implement the Program for the socio-economic development of the country for 2018-2024, further ensuring high rates of socio-economic development of the country, activating business activities in various sectors of the national economy, increasing the range and volumes of goods produced by SMEs, increasing their competitiveness in foreign markets, promote the development of private entrepreneurship (Ministry of Industry Turkmenistan 2018).</p>

4.4.4 Key SCP related initiatives

In 2018, UNESCO held an International Conference in Ashgabat on the Importance of the Great Silk Roads to discuss how a best practices in several industries along the Silk Road can contribute to achieving the UN 2030 Agenda for Sustainable Development ([Unesco 2018](#)).

Considering the urgent water scarcity the country is facing, the Institute of Agricultural Development in Transition Economies (IAMO) co-organised and supported the conference on sustainable land and water management in Ashgabat aiming to discuss strategies to modernise agriculture and adapt to climate change in Turkemistan ([Leibniz Institut für Agrarentwicklung in Transformationsökonomien 2017](#)).

4.5 Uzbekistan

4.5.1 Sectoral profile

Uzbekistan's economy has been steadily developing with an annual GDP growth rate of over 8%. Its population of more than 31 million people will reach 37 million by 2030 according to UN predictions. With its educated workforce and access to a variety of raw materials as well as an increasing domestic market, the country shows great potential to develop into a key player in the Central Asian textile and RMG sector.

From 2000 to 2016, the share of small businesses contributing to GDP increased from 31.0% to 56.9%. Most employed individuals work for small businesses, which account for 75.7% of total employment (2012). In 2016, the largest share of small business and private entrepreneurship in Gross regional product (GRP) was in Djizak and the Namangan regions, accounting for 80.3% ([Asian Development Bank 2012](#)) ([State Committee Of The Republic of Uzbekistan on Statistics 2017](#)). The number of small businesses has increased in particular in the food industry, light industry, construction materials industry, mechanical engineering and metal processing, chemical, petrochemical, and pharmaceutical industries ([State Committee Of The Republic of Uzbekistan on Statistics 2017](#)).

One of the biggest sustainability challenges faced by Uzbekistan concerns the water resources of the country. During the lifespan of one generation, the Aral Sea, once among the largest inland water bodies in the world, has turned to be at the edge of total disappearance. This has caused irreversible damage to the local population, ecosystems as well as the country's biodiversity ([UNFCCC 2016](#)). In addition, the large-scale use of chemicals for cotton cultivation, inefficient irrigation and poor drainage systems have led to a high filtration of contaminated and salinized water back into the soil. Almost 50% of all irrigated land is classified as saline, and about 5% of irrigated land as severely saline. The combination of disproportional fertilization, the failure to practice crop rotation and soil salinization are affecting the productivity of the land. In recent years, the hectare yield of cotton has decreased by up to 30% in different regions. Moreover, water pollution from industrial waste and soil contamination from the widespread use of fertilizers, pesticides and agricultural chemicals (including DDT) are cause for human health disorders ([United Nations Economic Commission for Europe 2010](#)).

4.5.1.1 Textile and RMG Sector

With its substantial resources of high quality cotton, wool and silk, low power supply cost, skilled and cheap manpower, as well as its developed infrastructure and innovation basis, Uzbekistan provides great conditions for the textile industry ([Nasirkhodjaeva 2010](#)).

Besides the strong current focus on cotton products, the Uzbek textile industry has a long history in manufacturing silk and wool products. The cotton-processing industry took off during the industrialization period of the former USSR. Private textile mills began operating after 1995 because private entrepreneurs realized the potential of the textile industry. Almost all of the enterprises were privatized and turned into joint stock companies, in which the Uzbek government remains the main shareholder.

Forced labor is a major problem in Uzbekistan's cotton industry. Every fall, the Uzbek government shuts down schools for months and forces one-third of Uzbeks - including over a million children, teachers and civil servants - to work in the government-run cotton industry. Besides the forced work the cotton industry damages the environment through intense irrigation and drainage as well as pesticide use leading to surplus of salt in the soil, which further harms workers health ([China Labor Watch 2011](#)).

Since 2003, the construction of modern textile complexes including finishing, knitting and garment manufacturing is underway. Projects are mainly implemented through direct foreign investments. Compared to the previous years when exports of semi-finished textile products, such as yarn and gray fabric, comprised almost 100%, the enterprises recently managed to increase the export volume of garments and apparel considerably ([Tursunov 2007](#)).

To date, about 7,000 enterprises of the industry are operating in the country. There is capacity to produce 1.4 million tons of cotton fibre, of which about 60% is used to meet the needs of domestic textile enterprises. If in early 2017 there were 293 exporting enterprises, then by the end of the year their number had reached 350. In 2017, light industry enterprises of Uzbekistan exported textile products for USD 1.1 billion ([Yarns and Fibers 2018](#)).

According to the Association of Textile and Clothing Industries Enterprises, the creation of clusters plays a role in the further development of the textile industry. Each cluster contains the organization of a single

production cycle, such as the cultivation of raw cotton, primary processing and its further processing at ginneries into final products ([Yarns and Fibers 2018](#)). Uzbekistan and Kazakhstan are planning to create a joint cluster for the processing of cotton where they will take control of that entire process ([Henry Dsouza 2018](#)).

4.5.1.2 Leather sector

The Uzbek leather and shoe industry consists of 30 automated slaughterhouses (supplied by livestock farms), 63 tanneries including pre-tanning facilities, 131 shoe manufacturers and 28 producers of other products including fur (as of June 30th 2018) ([Textination 2018](#)).

Since the Uzbek Government has launched an initiative in 2016 to modernize and expand its shoe and leather sector, the industry has seen a new wave of investment. The aim of the initiative, which began its implementation in 2018, is to increase efficiency and expand the production as well as to accelerate its integration into the international market. Producers were focusing primarily on Russian and Kazakh markets, but also on Western countries such as France ([Textination 2016a](#)). Other main export countries for shoe and leather goods are currently China, Pakistan, Turkey, India, Korea, Italy, the UK and Spain. Due to the new wave of investments exports are expected to increase from USD 191 Mio. (2016) to USD 301 Mio. in 2020 ([Textination 2016a](#)).

A major driver of the expansion and modernization program is the Uzbek Association of Leather and Shoes O'zbekcharympoyabzali which acts on behalf of the state as the central regulator and coordinator of the sector. It oversees, among other things, investments and foreign trade of the industry. Almost all notable Uzbek players in the leather industry are active under its umbrella ([Textination 2018](#)).

4.5.1.3 Silk sector

Uzbekistan can look back on a rich history of textile handicrafts, including its famous colored Ikat textiles, Bukhara golden embroidery, the abundantly embroidered wall carpets Suzani, and the Karakalpak embroidered handbags and accessories among which many are made of silk or cotton and silk blends ([Bendix et al. 2013](#)).

More than 80 million units of linear plantings and 51 thousand hectares of mulberry plantations existing today provide rearing silkworm larvae in volume of about 26 thousand tons of silkworm cocoons ([Embassy of the Republic of Uzbekistan in the federal republic of Germany 2017](#)). Silk has remained trademark of many contemporary designers and fashion brands of Uzbekistan who use Central Asian Ikat, a unique textile, which is patterned by dyeing the threads before weaving. Tajik sericulture sites that used to supply the weavers in the neighbouring country have almost completely disappeared in view of the turmoil following the dissolution of the USSR and the long-lasting civil war. In Uzbekistan, most activities regarding silk product manufacturing occur on a very small scale (MSMEs); many of the production processes are happening in community households. Around 95% of the workers involved in silk and Ikat production and fashion production are women.

4.5.1.4 Cashmere and Wool sector

Within the Soviet period, a lot of knowledge about processing wool was lost. Domestic processing occurred until the imposition of Soviet rule and, on a small-scale, even beyond that time. To sell the wool, however, was no longer economically attractive. Today, Uzbekistan contributes with 3% to the worldwide wool production. Black wool goats that appeared as a by-product in the formation of a new breed - the Soviet Mohair goats ([Hughes 2017](#)) - are common in Uzbekistan. Efforts to revive carpet manufacturing based on wool have encountered difficulties due to bottlenecks in the sourcing of domestically produced high quality wool ([Evers and Wall 2006](#)).

4.5.2 Consumer profile

Uzbekistan is the most populous country in Central Asia with 32.36 million inhabitants. Despite a steady increase in purchasing power over the last years, the Uzbek consumer is on average not particularly wealthy and 13% of the population lives below the poverty line. 75% of those below the poverty line live in rural areas, while nearly half of the whole population lives in Tashkent and the region of Fergana Valley.

The average Uzbek consumer is young and well-educated: The median age is 28.6 years and a quarter of the population is below the age of 24. Furthermore, adult literacy rate is 99.2% and high school enrollment rate reaches 99.94% ([Societe General 2018](#)).

Rising incomes and growing purchasing power of Uzbek households show a strong market potential. According to data compiled by the World Bank, household final consumption reached a new peak of 221 trillion Uzbek som last year, which is equivalent to approximately US\$27 billion ([Batmanghelid 2019](#)).

The dominant retail sales locations are traditional 'bozors', or markets. Recently, however, the first shopping malls have opened and show the way to a newly affluent lifestyle to an emerging middle class ([Eurasian Investors 2019](#)). A survey of Uzbek consumers of cotton knitwear revealed that the most important factors for Uzbek consumers are price, color spectrum and technical characteristics, followed by design, place and brand. Products made in Uzbekistan are popular in local market segments especially for the low and middle income consumers ([Tursunov 2007](#)).

As a consequence of the recent rapid and continued growth of domestic consumption, also about 60% of locally produced cotton is being consumed domestically ([Leonardi 2018](#)).

4.5.3 SCP framework

SCP policy

The 1997 National Sustainable Development Strategy (NSDS) continues to serve as the overarching framework for sustainable development and functions as the basic reference document for all strategies and legislation. The established National Commission for Sustainable Development, however was abolished in 2005 and its policy functions were delegated to the Cabinet of Ministers, while the implementation of the NSDS was delegated to the Information and Analytical Department on Agriculture, Water Management and the Processing of Agricultural Production and Goods within the Cabinet of Ministers.

The 2007 Privatization Programme for 2007-2010 is the current basic document specifically for guiding the Government's economic policy. It envisages continued economic growth, to a large extent through the complete or partial privatization of approximately 1,500 enterprises, facilities and state-owned shareholdings in the textile sector.

In 2008, a second implementation programme, the Programme of Actions on Nature Protection for 2008 – 2012 (PANP) was adopted for a subsequent five-year period. It covers four major areas supported by 44 projects: 17 projects on environmental protection and ensuring environmental safety, 15 on the rational use of natural resources and the introduction of environment-friendly methods of economic activity and management, 8 on streamlining the legislative framework and the development of environmental research, education and training, and 4 on international cooperation and regional environmental safety.

In 2007, the Senate Committee on Agrarian Issues, Water Management and the

	<p>Environment approved a draft national waste management strategy and action plan for 2008–2017 aimed at improving waste collection and the treatment infrastructure through better financing and management and the use of administrative, legal and economic incentives to reduce the non-renewable loss of raw material resources (United Nations Economic Commission for Europe 2009).</p>
SPP/GPP	<p>The Uzbek Ministry of Economy published a new law on public procurement in 2018 that specifies requirements for procurement activities, but does not go beyond mentioning the role of corruption and transparency in tender evaluations. Sustainability factors are not considered (Ministry of Economy and Industry of Uzbekistan 2018).</p> <p>The Budget System Reform in Uzbekistan aimed to improve legal and regulatory frameworks to ensure efficient and transparent state procurement and to strengthen human resource capacity (UNDP 2015). As part of the reform, a report titled <i>Green Procurement: International Experience, Perspectives for Application in Uzbekistan and Gains for the State Budget</i> was prepared (UZ Daily 2015).</p>
Ecolabelling	<p>In 2016, an eco-labelling scheme was brought on the way. The labelling of products is carried out on a voluntary basis at the initiative of a manufacturer or distributor. The inspected products are supposed to be divided into three main categories on which the labelling will be based on: 1) environmental certification in Uzbekistan, 2) declaration of conformity with the requirements of ecological safety presented by an applicant, and 3) information on environmental characteristics of the stages of the product life cycle.</p> <p>Experts of the State Committee for Nature Protection emphasize that the introduction of its own eco-labelling will allow Uzbekistan to join The Global Ecolabelling Network, which incorporates 45 of world's most developed countries. Besides, it would improve the quality, attractiveness and competitiveness of domestic products in foreign markets, create additional incentives for the introduction of environmentally-friendly technologies, improve health of the population and ensure environmental friendliness of products. The Uzbek eco-label will be represented by a graphical representation of the Humo bird with green wings, stylized as leaves, symbolizing the origin of life and nature (Uzbek Embassy in Italy 2016) (State Committee of the Republic of Uzbekistan for Investments 2016).</p> <p>Co-chaired by the IFC and Responsible Sourcing Network (RSN), the Second Consultative Council Meeting of the Project on Sustainable Cotton Supply Chain Development in Uzbekistan took place in Tashkent on February 28, 2019 with over 40 stakeholders in attendance. Through this Project, IFC aims to test and adjust a credible methodology for implementing a sustainable cotton standard system based on the Better Cotton Initiative (BCI) principles to the conditions of Uzbekistan. The aim is to have BCI approve Uzbekistan as a country in which it can license farms producing Better Cotton (International Finance Cooperation 2019).</p>
Sustainable SMEs	<p>The Agency for Development of Small Business and Entrepreneurship under the Ministry of Economy and Industry of the Republic of Uzbekistan was established in accordance with the Resolution of the Government of the Republic of Uzbekistan (Ministry of Economy and industry of Uzbekistan 2018).</p> <p>In August 2017, the State Fund for Business Support was created to provide financial support to SMEs via credit lines and guarantees (European Bank for Reconstruction</p>

[and Development 2018a](#)).

The IFC SME Policy Project and the Ministry of Justice have jointly taken steps to raise the level of legal awareness among SMEs. Since 2003, the IFC SME Policy Project has been actively collaborating with a number of ministries and departments in Uzbekistan to improve the system for directing and conducting inspections. The President's Resolution of 2005 introduced advantages for SMEs regarding tax obligations. The submission of tax calculations, fees, and other compulsory payments were switched from a monthly to a quarterly routine for SMEs for example. Additionally, state tax and statistical agencies are no longer permitted to demand any information, references, or documents, other than the established financial and statistical reports from SMEs, except in the course of inspections and in the manner specified by law ([IFC 2004](#)).

Under its last strategy, approved in 2005, the EBRD concentrated on developing the private sector and supporting entrepreneurship with a special focus on SMEs and foreign investment. From 2005 to 2010, the Bank invested over €80 million across more than 20 projects in the country. The bank offered training to more than 600 SMEs through business advisory services. The EBRD was able to establish a large network of local and international consultants to help the SMEs develop business plans, restructure production capacities, and implement more sophisticated quality management ([European Bank for Reconstruction and Development 2018b](#)).

4.5.4 Key SCP related initiatives

The shoe and leather association O'zcharmsanoat is a central actor for the modernization of the sector ([Textination 2018](#)).

Uzbekistan works closely with UN agencies to fulfil the SDGs. Some practical examples include a UNICEF mission to improve the wellbeing of children and women, the development of rural areas with emphasis on agricultural modernization, trade facilitation and boosting economic growth ([UNECE 2017](#)).

A proposed project by the Green Climate Fund aims to enable the construction of approximately 23,370 energy-efficient and low-carbon individual family rural houses/apartments in multi-apartment rural houses through the implementation of a green procurement mechanism for energy-efficient building materials ([Green Climate Fund 2017](#)).

An OECD Public-Private Working Group was created at the beginning of 2016 to help design the policies to address barriers faced by SMEs limiting their export potential. Barriers could be overcome through export promotion policies and institutions for SMEs ([OECD 2017](#)).

An ESMAP expert provided technical assistance to design the third phase of the USD 200 million Energy Efficiency Facility for Industrial Enterprises Project to help SMEs reduce energy consumption by becoming more energy efficient ([ESMAP 2018](#)).

In 2018, a cooperation was established between the Uzbek Association of Textile and RMG Industries, Uzteksilprom and the German Institute Hohenstein to build scientific laboratories for research in the area of textiles in Uzbekistan ([Uzbek Embassy in Germany 2018](#)).

One goal of UNESCO is to encourage regional identities. Therefore, a good portion of the initiatives revolves around supporting traditional handicraft activities, in particular in the textile sector, with the concrete intention of revitalizing and restoring old techniques and handiwork items ([Bendix et al. 2013](#)).

JICA has also been extending cooperation to Uzbekistan since 2009 in revitalizing their sericulture industry in collaboration with Tokyo University of Agriculture and Technology ([Japan International Cooperation Agency 2013](#)).

5 Thematic priority areas regarding SCP in the Asian fashion and apparel sector

5.1 Suggested thematic approaches

This section provides an overview over possible thematic focus areas that could be addressed by a regional action programme. The topics were chosen based on relevance, SPP potential and/or available good practices in the region, as well as the impacts that can potentially be achieved.

The topics identified further minimize the overlap with already running international technical cooperation projects. A large potential to reduce environmental and social impacts in Asia's textile and apparel industry lies in the shift from end-of-life solutions towards the greening of production steps. However, these topics are largely dealt with under the regional projects and initiatives such as GIZ SLSG/FABRIC, IFC and UNIDO. In order to avoid parallel structures, but to rather build on these existing initiatives, the following thematic subjects are proposed:

- 1) **Guidelines and enabling framework** to ensure adequate involvement and participation of the SMEs in relevant policies as well as to support greening supply chains aiming at more circularity in the sector;
- 2) Establishment of a **multistakeholder dialogue platform/mechanism**, involving public, private, SMEs, brands, retailers, and civil society to ensure a more comprehensive understanding of the sector and promote adequate information for responsible consumption;
- 3) The elaboration of a criteria catalogue for **Eco-labelling** and the preparation of sector-specific guidelines together with required independent monitoring and supervision systems.

5.2 Map of key stakeholder groups and key actors

To create an efficient, effective and holistic working process, and to ensure a multi-level and integrated stakeholder approach, the programme should include and work with members representing following stakeholder groups:

1. **Policymakers** at various levels can give direction for the transition creating the right enabling conditions and incentives. In addition, they can set the examples by fostering the adoption and implementation of GPP/SPP which will send out the right signal, both to industry actors and consumers. **Representatives of GPP/SPP and eco-labelling nodal agencies** of countries in the region with established (or in process) GPP/SPP initiatives should be specifically considered as key and/or supportive actors. In addition, European counterparts as well as experts or officials from other countries who contribute to either the development and/or implementation of sector specific GPP/SPP and eco-labels schemes could be valuable resources.
2. **Industry** (regardless of size) at each stage of the value chain plays a key role to operationalise the systemic changes in the textiles/leather system. **Industry associations** can act as a conduit between policy makers and industry, providing support by translating policies and programmes into sector-specific actions plans, and by feeding the industry's perspective into the planning and policy development processes. Apart from that, the associations are well-positioned to foster collaboration among players along the value chain. Representatives of **sector associations with established sustainability programmes and/or focal points** are of particular relevance. Additionally, individual innovative entrepreneurs with a track record of embracing new sustainable business

models should be brought on-board. To ensure the consideration and reflection of the SME perspective, representatives from SME associations should also be involved (e.g. Dhaka Chamber of Commerce and Industry DCCI/Bangladesh, BUILD/Bangladesh). Also business intermediaries which extend SCP related training and advisory services to SMEs (e.g. National Cleaner Production Center in Vietnam and Sri Lanka) can be valuable partners.

3. **Brands and retailers** find themselves at the end of the value chain positioned at a crossroad between sustainable consumption and production. This position enables them to reach out to both consumers and down-stream players in production alike. On the one hand, they can influence the formers' purchasing behaviour by changing their value proposition and marketing, and on the other hand, by addressing the latter's challenges in the supply chains thereby inducing change. In several of the manufacturing countries, formal buyers' fora bring international brand representatives together usually representing the large brands. It is suggested to involve such selected brand representatives and conveners, as well as organisations, which are actively involved in advancing sourcing from SMEs (e.g. Fair-trade networks, CARE International).
4. **Education and research institutions** can support the transition by embedding SCP (and circular economy) principles in their teaching, as well as by finding solutions through research and innovations that overcome technical challenges along the value chain. In this context, researchers may be encouraged to join and to support the programme with academic research as well as scientific approaches (e.g. Asian Institute of Technology, Bangladesh University of Fashion Technology – BUFT, United Nations University Institute for the Advanced Study of Sustainability UNU-IAS, Japan; University of Lahore, Pakistan).
5. Finally, **NGOs, international bodies and development partners** ensure that broader environmental and societal considerations are taken into account in future solutions. Effective donor coordination further prevents overlaps and facilitates synergies. This would also help to link the programme with existing SCP related initiatives in the region. In particular, representatives/experts of UN Environment and GIZ FABRIC who are engaged with the regional GPP/SPP or Green Purchasing Networks (e.g. Green Purchasing Network India/Ekonnnect Knowledge Foundation, Green Purchasing Network Indonesia⁶) should be included from the beginning of the planning phase.
6. **Consumer Associations** are advocacy groups mobilising to protect consumers from unsafe products, false advertising or pollution caused by corporate practices through forms of protests, litigation, lobbying or campaigning. Consumer association of the textile and leather sector will add the view of consumers and represent their expectations towards textile and leather products.

A detailed list of institutions and persons to be considered important stakeholders in lieu with the recommended thematic areas can be found in Annex 4.

⁶ Possible involvement of individual members participating in International Green Purchasing Network (IGPN), <http://www.igpn.org> considered

Annex 1

List of interview partners

Name	Designation	Organisation	Country	Contact	Comments
AKM Farooq	Executive Director	Bangladesh Apparel Exchange	Bangladesh	farooq@denimexpert.com	
Begum Ara Ferdous	Chief Executive Officer	Business Initiative Leading Development (BUILD)	Bangladesh	ceo@buildbd.org	In her role as SCP Strategy Advisor and advisor to the Prime Minister's office, identifying overall and sector-specific systemic SCP implementation short-comings
Jürgen Bischoff	Senior Advisor	Support of Safety Retrofits and Environmental Upgrades in the Bangladeshi Ready-Made Garment (RMG) Sector	Bangladesh	bischoff@adelphi.de	Strategies and challenges for supporting implementation of measures for enhancing sustainable production practices
Md Saiful Islam	Secretary General	Leathergoods And Footwear Manufacturers & Exporters Association of Bangladesh (LFMEAB)	Bangladesh	md@picardbd.com	Overall strategy for leather sector development and the addressal of SCP aspects in Bangladesh, including role of certification schemes (such as the Leather Working Group – LWG).
Md. Sohrab Ali	Director, Department of Environment	Government of Bangladesh	Bangladesh	sohrab@doe.gov.bd	Prevalent needs and approaches towards addressing compliance monitoring/certification and sustainable production issues in Bangladesh textile and leather sector.

Monower Hossain	Sr. Deputy Secretary, Environmental Sustainability	Bangladesh Garment Manufacturers and Exporters Association (BGMEA)	Bangladesh	mithu051029@gmail.com	Identifying key environmental sustainability issues and challenges in the garment and textile sector in Bangladesh as well as alignment of efforts with development partners.
Mostafiz Uddin	Managing Director	Denim Expert Ltd. & Bangladesh Denim Expo	Bangladesh	mostafiz@denimexpert.com	Possible ways forward towards fashion sustainability from manufacturer's perspective.
Nishat Chowdhury	Program Manager	IFC, Partnership for Cleaner Textile (PaCT) Program	Bangladesh	nchowdhury2@ifc.org	National and regional approaches and initiatives towards tackling SCP issues in the textile sector.
Parag Huq	Additional Secretary	Ministry of Industry (MOI)	Bangladesh	paragmhug@yahoo.com	Leather sector policy for Bangladesh and addressal of sustainable production issues.
Sultan Ahmed	Director General, Department of Environment (DOE)	Government of Bangladesh	Bangladesh	dq@doe.gov.bd	Prevalent needs and approaches towards addressing compliance monitoring/certification and sustainable production issues in Bangladesh textile and leather sector.
Dr. K V Emmanuel	Executive Director	Indian Leather Industry Foundation (ILIFO)	India	kvemmanuel@yahoo.com	Covering sustainable production issues and developments in environmental management, wastewater and waste management in the Indian leather sector.
M Viswanathan	National Project Coordinator	UNIDO, Kanpur Leather Development Programme (KLDP)	India	mviswanathan@utlook.com	Covering sustainable production issues and developments in environmental management, wastewater and waste management in leather sector.
Ivan Kral	Leather Focal Point	UNIDO	International	I.KRAL@unido.org	Discussing UNIDO's perspective on leather sector development needs in Bangladesh, Pakistan and Mongolia, with special focus on occupational safety & health aspects.

Thongphet Phonsavath	Head	Cleaner Production Centre at Lao PDR	Laos	thongphetphonsavath@gmail.com	
Bayarmaa Enkhbayar	Senior Associate, Communications & Knowledge Management	Global Green Growth Institute (GGGI)	Mongolia	e.bayarmaa@gggi.org	
Dr Shinee Volooj	Partner, Consultant	Gerege Partners LLC	Mongolia	shinee.volooj@gmail.com	
Mr Guillaume Touati	Programme Leader	SWITCH-Asia Sustainable Textile Production and EcoLabelling (STeP EcoLab)	Mongolia	g.touati@avsf.org	
Jacob Clere	Team Leader	SMART Myanmar	Myanmar	jacob.clere@smartmyanmar.org	Identifying sectoral needs related to SCP, GPP and eco-labelling
Salman Butt	Advisor to IFC PACT	Espire Green Pakistan	Pakistan	salman@espire.com.pk	Identifying sectoral needs as well as relevant ongoing initiatives in Pakistan (former national project director, ESPIRE Green Initiative under EU-SWITCH)
Hosna Ferdass Sumi	Private Sector Specialist (Leather)	IFC/WorldBank	Regional	hsumi@ifc.org	Identifying sectoral priority areas for the textile and leather sector in context of sustainability, road mapping and enhancing compliance.
Kazy Mohammad Iqbal Hossain	South East Asia Regional Sustainability Officer	Lindex	Regional	Kazy.Iqbal@lindex.com	Identifying sectoral priority areas and challenges for RMG and textile sector in South East Asian region from buyer's perspective as well as scope for possible involvement of international brands at regional level.

Rakesh Vazirani	Head, Sustainability Services, Products/ Supply Chain Sustainability/ Consumer Products	TÜV Rheinland Group	Regional	Rakesh.Vazirani@tuv.com	Possible outreach services and approaches about transparency and certification.
Sanjay Shrivastava	Programme leader	Worldbank	Regional	ssrivastava1@worldbank.org	Identifying sectoral priority areas for textile and leather sector in context of sustainability road mapping and enhancing compliance.
Suiko Yoshijima	Senior Environmental Specialist	World Bank; Energy and Environment Unit, MENA Region,	Regional	syoshijima@worldbank.org	Possible strategies and areas of interventions for enhancing SCP in relevant sectors.
Sumona Paul	Sustainability Program Manager	H&M	Regional	sumona.paul@hm.com	Identifying sectoral priority areas and challenges for RMG and textile sector in Bangladesh, Myanmar and Pakistan from buyer's perspective.
Werner Lange	Textile Cluster Coordinator	GIZ	Regional	werner.lange@giz.de	Regional approaches and initiatives towards tackling SCP issues in the textile and leather sector.
Samantha Kumarasena	Chief Executive Officer	National Cleaner Production Centre Sri Lanka	Sri Lanka	samanthakumarasena@gmail.com	
Le Xuan Thinh	Director	Vietnam Cleaner Production Centre Co. Ltd (VNCPC)	Viet Nam	Thinh.LX@vncpc.org	

Annex 2

Overview of selected sector-relevant labelling and certificate schemes

Country/ Region	Label/ Standard	Link	Description
China	China Environmental Labelling	www.sepa.gov.cn	Initiated by SEPA in 1993, provides environmental standards incl. textiles.
India	Ecomark India	http://cercervis.nic.in/indproduct.html	Approval programme for environmentally preferable consumer products, covering textiles and leather, follows a cradle-to-grave approach, established in 1991.
Indonesia	Ekolabel Indonesia	www.menlh.go.id/ekolabel-indonesia/	Applied to retail goods in Indonesia, including textile and leather products, established in 2006,
Thailand	Thai Green Label Products	http://www.tei.or.th/greenlabel/en/index.html	Established 1993 by the Ministry of Industry, the Ministry of Science and Technology and the Ministry of Environment and natural Resources. Applies for instance to products made from cloth, curtains, blinds and footwear.
Vietnam	Vietnam Green Label	http://vea.gov.vn	Established in 2009, not yet covering textile or leather products.
International	Leather Working Group	https://www.leatherworkinggroup.com/	Assesses environmental compliance and performance capabilities of leather manufacturers and promotes sustainable and appropriate environmental business practices within the leather industry.
International	Global Organic Textile Standard (GOTS)	www.global-standard.org	Standards in the field of eco-textile processing to define world-wide recognised requirements that ensure organic status of textiles, from harvesting of the raw materials, through environmentally and socially responsible manufacturing up to labelling to provide a credible assurance to end-consumers. Processors and manufacturers shall be enabled to supply their organic fabrics and garments with one certification accepted in all major selling markets. Established in 2008.
International	Naturtextil Best	https://naturtextil.de/	Holistic standard considering environmental and social criteria along the whole textile and leather production chain, established in 2000.

International	Nordic Swan	www.nordic-ecolabel.org/	Ecolabel based on lifecycle assessments with a focus on environmental aspects. Covers textiles, hides/skins and leather, established 1989.
International	Better Cotton Initiative (BCI)	https://bettercotton.org/	Comprehensive set of production principles and criteria for growing cotton in a more sustainable manner: socially, environmentally and economically, established in 2005
International	bluesign	http://www.bluesign.com/	Aims to reduce the ecological footprint of a responsibly acting textile industry. The standard analyses all input streams – from raw materials to chemical components and resources – with a sophisticated “Input Stream Management” process, established in 2001.
International	Cradle to Cradle - Textile	www.c2ccertified.org	Scheme propagating CE, the mark aims to validate manufacturers commitment to sustainability, established in 2010.
International	EU Ecolabel	http://ec.europa.eu/ecat/product/en/916162/textile-products-all-items-of-home-textiles	Initiated in 1992, a voluntary scheme designed to encourage businesses to market products and services that are kinder to the environment towards European consumers - including public and private purchasers, covering textiles and leather.
International	Oeko-Tex Standard 100	www.oeko-tex.com/en/business/certifications_and_services/ots_100/ots_100_start.xhtml	Globally uniform testing and certification system for textile raw materials, intermediate and end products at all stages of production, covering human-ecological attributes, established in 1992.
International	Oeko-Tex Standard 1000	https://testweb.oeko-tex.com/en/manufacturers/concept/oeko_tex_standard_1000/concept_oets_1000/concept_oets1000.html	Testing, auditing and certification system for environmentally-friendly production sites throughout the textile processing chain, established in 1995.
International	Sustainable Textile Production (STeP) by Oeko-tex	www.oeko-tex.com/en/business/certifications_and_services/step_by_oeko_tex/step_start.xhtml	Comprehensive certification system for brands, retail companies and manufacturers from the textile chain, modular approach covering management of chemicals, environmental performance, environmental management, occupational health and safety, social responsibility and quality management.
International	Worldwide	www.wrapcompliance.com	Seal certifying socially responsible

	Responsible Accredited Production (WRAP)	org/	production, evolving around 12 principles, demanding compliance with social, safety & health standards in line with international conventions and national legislation.
International	Zero Discharge of Hazardous Chemicals (ZDHC)	www.roadmaptozero.com	Offers trainings on sustainable chemical management in textile and leather manufacturing and certification to confirm the participation in training with the goal to eliminate the use of hazardous chemicals.
International	Certified Wildlife Friendly	http://wildlifefriendly.org/	The certificate sets a global standard for Wildlife Friendly® enterprise by subjecting products, and services, like tourism, to peer review. Development, certification, and promotion of responsible production and tourism practices. Considers wool and leather production, when livestock-wildlife conflicts may arise.
International	Testex	https://www.testex.de/	Tests quality of textile products.
International	World Fair Trade Organization	https://wfto.com/	The WFTO Guarantee System (GS) combines Fair Trade and social enterprise verification. The system is not certifying products but verifies fair trade and sustainable practices in enterprises. Established in 2011
Europe	EU Ecolabel: Textiles	http://ec.europa.eu/ecat/	Voluntary eco-labelling scheme from the European Commission encouraging the use of sustainable practices in textile and footwear manufacturing, including quantitative restrictions on wastewater emissions and hazardous substances.

The website Siegelklarheit <https://www.siegelklarheit.de> (in German only), operated by German Federal Ministry for Economic Cooperation and Development (Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung - BMZ), in cooperation with International Trade Center (ITC, www.intracen.org) und der ISEAL Alliance (www.isealalliance.org), provides a detailed assessment of common labels on the basis of sustainability criteria. These include the three major areas: environmental friendliness, social compatibility and credibility. Within these groups, further subdivisions are made by topic. In textile production, for example, the environmental aspect is subdivided into the topics of water, chemicals, material use, quality, energy, waste and air pollution, and environmental management. The labels are tested according to this comprehensive catalogue of criteria in a multi-stage procedure and evaluated using a points system. It also indicates which stages in the lifecycle of the product are covered. For textile related labels: <https://www.siegelklarheit.de/home#textilien>; for leather related labels: <https://www.siegelklarheit.de/home#leder>

Annex 3

Overview of existing approaches, mechanisms and platforms regarding SCP in the fashion and apparel sector

In the field of green public procurement and eco-labelling, the EU can be a starting and/or reference point with regards to existing approaches in this regard. Regarding GPP, the EU approach can give pointers for which products to cover and which criteria to apply.

Range of products covered by GPP

Under the Revision of the EU Green Public Procurement (GPP) Criteria for Textile Products and Services ([Dodd and Caldas 2017](#)) the following products are covered:

- **Textile clothing and accessories** referring to clothing and accessories that consist of a minimum of 80 % of textile fibres (measured by weight) in a woven, non-woven or knitted form
- **Interior textiles** designed for interior use that consist of at least 80 % (measured by weight) of textile fibres in a woven, non-woven or knitted form;
- **Fibres, yarn, fabric and knitted panels** that are intended for the use in textile clothing and accessories and interior textiles, including upholstery fabric and mattress ticking prior to the application of backings and treatments associated with the final product;
- **Non-fibre elements** such as zips, buttons and other accessories that are incorporated into the product, as well as membranes, coatings and laminates;
- **Cleaning products**, including woven or non-woven fabric products intended for the wet or dry cleaning of surfaces and the drying of kitchenware.

As far as public procurement is concerned, the focus may be on specific products, such as work wear. Examples of work wear include: (a) representative work wear (e.g. army, police uniforms), (b) functional work wear (e.g. for waste collection services), or (c) protective clothing (e.g. for firemen). In the European context, public procurement of functional protective clothing for fire fighters, emergency services, police forces and the military sector as well as for health care professionals in public hospitals was identified as a key market driver for innovation. Other significant areas of procurement highlighted by best practice projects include bed linen and towels used by health services and care facilities, as well as interior textiles, such as curtains, upholstery, and textiles used in the general hygiene services for buildings (e.g. washroom handtowels). Apart from products, the EU GPP for textile also refers to specific services, such as:

- **Laundry** – the procuring authority owns the textile products and is responsible for their maintenance but subcontracts the laundry or dry cleaning. Collection and delivery are typically included within such a contract;
- **Maintenance** - the procuring authority owns the textile products and contracts repair services to extend the life span of the products. Typical examples are the replacement of buttons and zippers, fabric panel replacement and the retreating/reproofing of functional coatings;
- **Take-back** – a service provider is contracted to collect and sort the textile products owned by the procuring authority in order to ensure specific End-of-Life-management. The procuring authority waives the property of the textile products at the moment of their collection;
- **Renting** – the procuring authority does not own the textile products but rents them from a service provider. These contracts typically involve cleaning services as well. A typical example would be the supply of clean bed sheets to a hospital.

Criteria for consideration under GPP

Criteria for the consideration under GPP can be manifold and range from pesticide input, chemical content, organic fibres, recycled fibres, fair trade, EMS, risk assessments, wastewater treatment, end of life arrangements, disposal and/or packaging. The EU GPP for Textiles considers textiles that:

- Are made from fibres that are made using fewer fertilisers, hazardous pesticides and production chemicals
- contain recycled materials and fibres
- have a lower use of environmentally harmful and hazardous substances in their production
- that require less energy for drying and ironing
- do not shrink during use, and are more durable

The EU GPP further considers contracts that:

- minimise energy use during washing, drying and ironing of textiles
- maintain textiles in order to extend their lifetime
- maximise the potential for reuse and recycling of textiles

Specific criteria as per the European Ecolabel Textile ([Ecolabel EU 2019](#)) refer to (i) limitation of toxic residues in fibres, (ii) Reduction of air pollution during fibre process, (iii) reduction of water pollution during fibre process, (iv) limitation of the use of substances harmful for the environment (in particular aquatic environment) and health process, (v) Performance and durability during use phase as well as fundamental principles and rights at work (under section 5 corporate social responsibility). For details see ([European Commission 2014](#)).

As indicated earlier, none of the countries profiled in this study consider textile/leather products as part of their respective GPP or SPP, though these are already subject of public procurement policies (e.g. India) or eco-label schemes (e.g. Indonesia).

For special consideration: Enabling participation of SMEs

A working group looking into building linkages and synergies between policies for promoting SMEs in Public Procurement under “The Sustainable Public Procurement Programme of the 10-Year Framework of Programmes on Sustainable Consumption and Production Patterns”, ([Aguilar 2016](#)) concluded that SMEs face difficulties with the sizes of contracts, lack of access to relevant (quality) information (e.g. often due to inability of accessing electronic portal specifically dedicated to public procurement), disparities in information (information asymmetries) between the parties in a procurement process can give some parties an unfair advantage (World Bank, 2016), disproportionate qualification levels and financial requirements (e.g. meeting bid security and performance guarantee requirements). Because of the key role SMEs play in many economies, Governments have implemented various measures to facilitate the access of SMEs to the important market that public procurement represents, each with a potential level of market distortion and possibly discriminatory. For example, in India, the “Public Procurement Policy for Micro and Small Enterprises (MSEs) Order, 2012”, reserves 358 items, including many textile and leather products, for exclusive purchase from Micro and Small Enterprises, with the objective of achieving an overall procurement of minimum of 20 per cent ([Development Commission India 2012](#)).

Though (official) data on the social and environmental performance of SME’s is very limited, it is widely acknowledged that SMEs face challenges complying with standards and that their environmental impact can be significant, particularly in red categories such as textiles and leather production. Whilst the individual environmental impacts of each SME is generally small in comparison to those of large companies, the cumulative environmental impact of the sector is considerable, as 99.8% of Europe’s private companies, for instance, are SMEs (EU Directorate General for Environment, 2016). A particular challenge in general, both for the implementation of GPP and for SMEs as well, is the fact that environmental regulation (and its enforcement) is frequently lacking (International Trade Centre, 2014).

In their Final report on Promoting the Participation of SMEs in GPP, the working group members recommended that “in the case of countries where it is known that the enforcement of environmental regulations is weak, GPP must include the support to those laws (as much as permitted by their procurement law), while acknowledging that the business sector may need support to just comply to those standards, let alone being able to offer environmentally preferable products”.

Annex 4

Overview of relevant stakeholders

Name	Geographic relevance	Roles in context of SCP and thematic area	Status
Bangladesh University of Engineering and Technology (BUET) http://www.buet.ac.bd/	Bangladesh	Public engineering university of Bangladesh, established in 1876; leading consulting authority to assess and monitor the implementation of CETP of Tannery Estate Dhaka, Sava; contact persons: Dr.. Syeda Sultana Razia, Professor & Head, Department of Chemical Engineering and Dr.. Md. Ashraful Islam, Head of the department of Mechanical Engineering	ACA
Bangladesh University of Textiles (BUTEX) www.butex.edu.bd	Bangladesh	Only public engineering university for textile education, established in 2010; recently established department for environment, with special focus on propagating sustainable production in textile sector; contact person: Prof. Eng Md. Abul Kashem, Vice Chancellor	ACA
BGMEA University of Fashion & Technology (BUFT) www.buft.edu.bd/	Bangladesh	Private university for textile and fashion education run by BGMEA; contact person: Prof. Dr.. Engr. Ayub Nabi Khan, Pro Vice Chancellor	ACA
Institute of Leather Engineering & Technology (ILET), University of Dhaka www.du.ac.bd	Bangladesh	Established in 1949, the oldest and leading educational institute of the country for leather sector (engineering and technology); providing tertiary education in leather, footwear and leather products science, technical service to the different government organization (i.e. Bangladesh Defence, Bangladesh Police, Customs, RAB, NBR, Border guard Bangladesh etc. with regard to justifiable issues of leather and related products . It involves in different domestic and international research and development projects relating to leather, footwear and environment; contact person: Sobur Ahmed (Associate Professor, Department of Leather Engineering &	ACA

		Technology)	
Yangon Technological University's Textile Engineering Department www.ytu.edu.mm	Myanmar	Providing research and academic training in textile and chemical engineering, contact person: Dr. Swe Swe Hnin (Professor and Head of Department)	ACA
Central Procurement Technical Unit (CPTU) www.cptu.gov.bd	Bangladesh	Key authority involved in matters related to public procurement process in Bangladesh; contact person: Md. Ali Noor, Director General, cptudg@cptu.gov.bd	GOV
Department of Environment (DoE) www.doe.gov.bd	Bangladesh	Responsible authority in Bangladesh on environmental issues and its implementation; strongly propagating resource efficiency in industry, including textile and leather; tasked with providing necessary actions for complying with national environmental conservation rules, mandated by Ministry of Forest, Environment and Climate Change with formulation of environment protection related policies, plans, strategies, acts and rules; contact persons: Dr Sultan Ahmed (Managing Director) dg@doe.gov.bd and Syed Nazmul Ahsan, Director (Environment Clearance)	GOV
Department of Textiles, under Ministry of Textiles and Jute https://motj.gov.bd/	Bangladesh	Responsible for development and implementation of Textiles & Jute Policy, planning implementation and evaluation; contact person: Md. Ismail, Director General	GOV
Sustainable & Renewable Energy Development Authority (SREDA) www.sreda.gov.bd	Bangladesh	Coordinating renewable energy and energy efficiency issues of the government and tasked with promotion of sustainable energy in Bangladesh; development of energy pass system; contact person: Md. Helal Uddin, Chairman	GOV
Ministry of Commerce, MoC www.moc.gov.kh/en-us/	Cambodia	Dedicated to national policy development and implementation for promoting job creation, economic growth, sustainable development and to improve the standard of living for all Cambodians; Ministry works in partnership with other government ministries; businesses, universities,	GOV

		organizations and the country's labour force; contact: Pan Sorasak, Minister; SCP focal point person to be nominated	
Ministry of Environment www.moe.gov.kh	Cambodia	Managing environmental protection, conservation of biodiversity, utilization of natural resources properly and sustainably; contact person: Say Sam AI, Minister, SCP focal point person to be nominated	GOV
Nordic Council www.norden.org/en	Europe	Various initiatives dedicated to SCP, amongst others involved in elaboration of mandatory or voluntary eco-design criteria for textiles as well as promotion of transparent and responsible textile (after-use) collection and handling, involved in development of a voluntary certification system for textile collection organisations; contact persons: David Watson, Senior Consultant (PlanMiljø) and Anne Fråne, project leader	GOV
Bureau of Indian Standards https://bis.gov.in	India	Amongst other, administering national eco-mark for various products and product groups, including textile and leather, contact person: M V S D Prasada Rao, Scientist-G & Deputy Director General (Certification)	GOV
Central Leather Research Institute (CSIR-CLRI) www.clri.org	India	Founded in 1948, apex body and central hub in Indian leather sector with direct roles in education, research, training, testing, designing, forecasting, planning, social empowerment and leading in science and technology relating to leather; mandated with assessing and forecasting technology needs, serving as a reliable consultant to leather sector, developing technologies and delivering to the industry through effective extension network; contact person: Prof. Santosh Kapuria (Director)	GOV
Ministry of Environment http://standardisasi.menlhk.go.id/	Indonesia	Eco-label system coordinated by Centre for Environmental and Forestry Standardization, labels available for different product groups including textiles.	GOV
Cleaner Production Centre for Lao PDR	Laos	Established by Ministry of Industry and Commerce in mid-2007 in close	GOV

http://laocpc.org/		cooperation and supported by UNIDO under its global Cleaner Production promotion movement; contact person: Thongphet Phonsavath, Head of Centre	
Malaysian Green Technology Corporation (GreenTech Malaysia) www.myhijau.my	Malaysia	Organisation under the purview of the Ministry of Energy, Science, Technology, Environment & Climate Change (MESTECC), coordinating the MyHIJAU Programme aiming at promote the sourcing as well as purchasing of goods and services that are environmentally friendly; contact person: Kamaradzaman Mohd Bakri, Head Of Division - Green Catalyst	GOV
Ministry of Food, Agriculture and Light Industry www.zasag.mn/en/m/mia	Mongolia	Ensuring proper use of agricultural resources, developing value chains and competitiveness of the industries, contact person: Chultem Ulaan, Minister, technical person to be nominated	GOV
Ministry of Nature, Environment and Tourism www.mne.mn https://zasag.mn/en/m/megd	Mongolia	Responsible for the state policies on environment and climate change, monitors the implementations of the policies, devises decent legal frameworks to promote & develop resource efficiency; contact person: Mrs T. Bulgan, Director, Department of Green Policy and Strategy Planning	GOV
Mongolian Agency for Standardisation and Metrology (MASM) https://masm.gov.mn	Mongolia	Involved in EU-SWITCH initiative on green product development and eco-labelling for locally produced products for leather, wood, wool & cashmere, food, handicraft and tourism; contact person: Ms Gerel Batochir	GOV
Environmental Conservation Department www.ecd.gov.mm	Myanmar	Mandated with propagating action against climate change and pollution; contact person: Daw Khin Thida Tin (Director of the Environmental Conservation Department)	GOV
Central Environmental Authority, Ministry of Mahaweli Development and Environment www.cea.lk/	Sri Lanka	National organisation under Ministry of Mahaweli Development and Environment, involved for environment and focal point for international	GOV

		conventions, tasked with development national policies and guidelines as well as monitoring compliance with national environmental standards, contact person: R.W.S.M.N. Manoratne	
Centre for the Development of Leather Products and Footwear www.idb.gov.lk	Sri Lanka	Unit under Industrial Development Board (IDB), Ministry of Industry and Commerce mandated with sectoral development; provide technological support and human resource development in leather sector of Sri Lanka, including access to capacity building and skilled workforce in leather sector, contact person: Director (to be named), idblpd@gmail.com	GOV
Ministry of Mahaweli Development and Environment http://mmde.gov.lk/web/	Sri Lanka	National organisation for environment and SCP focal point; leading organisation in development of national SCP policy; contact persons: Ms. Dhammika Wijayasinghe (Director) and Ms. Nalini Kohowala	GOV
National Procurement Commission (NPC) www.nprocom.gov.lk	Sri Lanka	Sole authority, established in 2015, for the governance of all procurement activities by government institutions; ensuring formulation of procurement policy, guidelines, practices, monitoring and investigation of procurement actions of procuring entities to guarantee implementation of policies, guidelines and best practices by government institutions, assessment of procurement capacity of government institutions, procurement capacity building and reporting to appropriate authorities on procurement performance of procuring entities and individuals; contact person: Charles K. Dondieu, Chairperson	GOV
Sri Lanka Standard Institute (SLSI) www.slsi.lk	Sri Lanka	National standards body of Sri Lanka, involved amongst in developing ecolabel for dairy productions; provides training on SCP, EMS, Energy Management System, OHS, Laboratory QMS, etc., contact person: Dr.. (Mrs) Siddhika G Senaratne, Director-General	GOV
Thailand Environment Institute http://www.tei.or.th	Thailand	Involved in elaboration and administering Thai green label initiative; contact person: Dr.. Chuttree Phurat, Subdivision of Criteria Development	GOV

Department of Science and Technology www.most.gov.vn	Vietnam	Contributing with scientific research insights about technology development, innovation activities, development of standards and quality control; contact person: Mrs Pham Thu Giang (Vice Director General of Department of Science and Technology of MOIT)	GOV
Vietnam Green Label Office http://vea.gov.vn	Vietnam	Established under Minister of Natural Resource & Environment (MONRE); contact person: Ms. Nguyen Thu Ha, Deputy Director of Policy and Legislation Department	GOV
Bangladesh Finished Leather, Leather Goods & Footwear Exporters Association (BFLLEA) www.bflleabd.org	Bangladesh	Stakeholder association of manufacturers and exporters of finished leather, leather goods and footwear in Bangladesh; involved implementing partner in EU-SWITCH ECOLEBAN (implementation of environmental management systems and eco-labelling schemes in SMEs of the leather sector in Bangladesh) focusing on propagating SCP and eco-labelling in the leather sector of Bangladesh; participating in national dialogue between stakeholders and government to formulate roadmap for leather sector sustainability and business opportunities, arranging technical session and training for the stakeholders for capacity building with regard to SCP; contact person: Mr. Mahiuddin Mahi, President	IND
Bangladesh Garment Manufacturer Exporter Association (BGMEA) www.bgmea.com.bd	Bangladesh	Leading trade association representing the RMG industry of Bangladesh, with a member of 5000+, started in 1983; dedicating department for propagating social and environmental standards; contact persons: Dr. Rubana Huq, President and Mr Monower Hossain, Sr. Deputy Secretary, Environmental Sustainability, BGMEA, Bangladesh	IND
Bangladesh Knitwear Manufacturers & Exporters Association (BKMEA) www.bkmea.com	Bangladesh	Body representing knitwear sector of Bangladesh, with dedicated advisory units for social and environmental performance and compliance aspects; contact person: A.K.M. Salim Osman, President	IND
Bangladesh Tanners Association (BTA)	Bangladesh	Stakeholders association manufacturers and exporters of crust and finished leather; involved implementing partner in EU-SWITCH	IND

www.tannersbd.com/		ECOLEBAN (Implementation of environmental management systems and eco-labelling schemes in the SMEs of the leather sector in Bangladesh) focusing on propagating SCP and eco-labelling in the leather sector of Bangladesh, focusing on SCP and eco-labelling in the tanning leather sector of Bangladesh; contact person: Mr. Shahin Ahmed, President	
Bangladesh Textile Mills Association (BTMA) www.btmadhaka.com/	Bangladesh	National trade organization representing around 1500 yarn, fabric manufacturers and textile product mills under private sector, contact person: Mr. Mohammad Ali Khokon, President	IND
Denim Experts Bangladesh www.denimexpert.com/	Bangladesh	Innovative denim manufacturing unit with management dedicated to practical perspectives about SCP challenges and opportunities for denim production and washing; vocal advocate for innovation, transparency and SCP in international fora such as Copenhagen Sustainable Fashion Summit, contact person: Mostafiz Uddin, Managing Director, Denim Expert Ltd. & Founder & CEO of Bangladesh Denim Expo	IND
Leather Engineers & Technologists' Society, Bangladesh http://letsb.org/	Bangladesh	Country's only professional representation of leather, footwear and leather products engineers directly involved in manufacturing process, facilitating technical and social assistance to the member engineers, representing in different national dialogue for capacity building of the leather sector sustainability, arranging technical session and training for the member engineers for capacity building including SCP, contact person: Mr. Tariqul Islam (President)	IND
Leather Finished Manufacturer and Exporters Association of Bangladesh (LFMEAB) http://lfmeab.org/	Bangladesh	Body representing manufacturers and exporters of leather goods and footwear, strongly propagating Leather Working Group (LWG) standard; one of the implementing partners of ECOLEBAN (Implementation of environmental management systems and eco-labelling schemes in the SMEs of the leather sector in Bangladesh), focusing on SCP and eco-labelling in the leather sector of Bangladesh; propagating and advocating SCP in leather product segment; contact person: Md. Saiful Islam,	IND

		President	
EuroCham Cambodia www.eurocham-cambodia.org	Cambodia	Joint initiative by three founding European Business Organizations, Chambre de Commerce Franco-Cambodgienne (CCFC), the British Business Association in Cambodia (BBAC) and the German Business Group, Arbeitskreis Deutsche Wirtschaft (ADW); with objectives of promoting interests of European businesses operating in Cambodia, facilitating the entry of European companies into the market and creating an extensive support network among corporate and individual members; contact person: Arnaud DARC, Chairman	IND
Garment Manufacturers Association in Cambodia (GMAC) www.gmac-cambodia.org	Cambodia	Apex trade body representing the garment and footwear industries in Cambodia, contact persons: Dr. Ken Loo, Secretary General and Kaing Monika, Deputy Secretary General	IND
Dutch Agreement on Sustainable Garments and Textile www.imvoconvenanten.nl	Europe	Coalition of industry associations, trade unions, NGOs, and the National Government of the Netherlands partners on Sustainable Garments and Textile; contact person: Pierre Hupperts, Chairman	IND
Indonesian Footwear Association (APRISINDO) www.aprisindo.or.id	Indonesia	Stakeholder association of footwear manufacturers; contact person: Drs. Harijanto	IND
Indonesian Tannery Association (APKI) www.indonesiantanners.com	Indonesia	Stakeholder association of manufacturers and exporters of leather and leather goods; facilitating technical and commercial services to the stakeholders, representing in national dialogue between stakeholders and government to formulate roadmap for leather sector sustainability and business opportunities; contact person: Liem Tjhing Tiong	IND
Lao National Chamber of Commerce and Industry (LNCCI) www.lncci.la	Laos	Independent body which represents the business community in Lao PDR, established in 1989, largest and most representative business community in Lao PDR, with separate group for textile and garment, Lao Textile and Garment Industry Group (LTGG) contact person: Mr. Oudet	IND

		Souvannavong, President	
Mongolian Association of Leather Industry (MALI)	Mongolia	Stakeholder association of manufacturers and exporters of finished leather, leather goods and footwear committed to development of international cooperation in tanning and shoe sphere, contact person: Mr. Bat-Ochir Mendbayar, Vice President	IND
Mongolian Wool and Cashmere Association www.mongoltextile.mn/	Mongolia	Established in 1993 as association dedicated to linking public sector and scientific organisations with private cashmere producers, presently involved in EU-SWITCH initiative STeP EcoLab, contact person: Mr. Bat-Erdene J., President	IND
Myanmar Garment Manufacturers Association (MGMA) www.myanmargarments.org	Myanmar	Body representing factory members, advising and matchmaking them, working closely with SMART Myanmar, contact persons: Ms. Khine Khine Nwe (Secretary General of the Myanmar Garment Manufacturers Association and the Joint Secretary of the national chamber of commerce), and Ms. Min Mon Myat (Staff member of MGMA and technical expert of SMART Myanmar)	IND
Ceylon Chamber of Commerce www.chamber.lk	Sri Lanka	Leading national business platform; involved in EU-SWITCH initiatives; organising annual Best Corporate Citizen Sustainability Award for recognition of the importance of Corporate Sustainability in Sri Lanka and encourages businesses to adopt best practices in line with achieving the UN Sustainable Development Goals (SDGs); contact person: Chandraratne Vithanage, Senior Assistant Secretary General; chandra@chamber.lk	IND
Joint Apparel Association Forum Sri Lanka (JAAFSL) www.srilankaapparel.com	Sri Lanka	Apex body of textile and apparel associations in Sri Lanka, dedicated towards positioning Sri Lanka's Apparel Industry as a 'Preferred Ethical Apparel Sourcing Destination'; contact person: Mr. Sharad Amalean, Chairman	IND

Sri Lanka Footwear and Leather Products Manufacturers Association (SLFLPMA)	Sri Lanka	Body representing manufacturers & exporters of leather goods and footwear, facilitating technical and commercial services to the stakeholders, representing in national dialogue between stakeholders and government organizations to promote leather sector business opportunities, amongst others organising annual foot wear and leather fair exhibition; contact person: P.G.D Nimalasiri, President	IND
Vietnam Leather and Shoes Association (LEFASO) http://www.lefaso.org.vn	Vietnam	Body representing interest of association members in leather and footwear sector; helping factories to comply with legal standards, contact person: Mr. Le Xuan Duong (Director of Centre for Leather Development and Research)	IND
European Commission/ Environment - JRC - Joint Research Centre http://ec.europa.eu/environment/ecolabel/criteria-development-and-revision.html	Europe	Contact persons: Jiannis Kougoulis Jiannis.Kougoulis@ec.europa.eu , Oliver Wolf Oliver.Wolf@ec.europa.eu (for footwear and textile) and Nicholas Dodd nicholas.dodd@ec.europa.eu (for textile)	INT
Partnership for Cleaner Textile (PACT) www.textilepact.net	Bangladesh, Pakistan	Initiative under International Finance Corporation (IFC), dedicated to sustainable water resources management and positive environmental change in textile wet processing sector, working in close cooperation with international fashion brands and Netherland government; contact person: Nishat Shahid Chowdhury, Program Manager	INT
Partnership for Sustainable Textiles www.textilbuendnis.com/	Germany	German government supported public-private sector initiative to enhance sustainability in international textile supply chains; contact person: Dr. Juergen Jansen; juergen.jansen@giz.de ; thematic focal point to be nominated	INT
Better Work https://betterwork.org/	Global	Partnership initiative of ILO and IFC, established in 2001, engaging with workers, employers and governments to improve working conditions and boost competitiveness of the garment industry; in the meantime active in	INT

		nine countries, including Bangladesh, Cambodia, Indonesia and Vietnam; contact person: Dan Rees	
UNIDO	Global	Involved in promotion of SCP; convener of RECP network, in leather sector convener of Leather Panel (https://leatherpanel.org/) a global forum for technical assistance programmes dealing with the leather-based industry sector, providing information on good practices in small-scale manufacturing as well as professional training and pollution control procedures in the leather, footwear and leather products industries; contact point: Ivan Kral, Sr. Advisor (Leather) or person nominated from Leather Panel	INT
amfori (formerly EU Foreign Trade Association) www.amfori.org	International	Globally active business association for open and sustainable trade bringing together over retailers, importers, brands and associations from more than 40 countries; involved in various initiatives in the region on propagating social and environmental performance (BSCI, BEPI), in various industrial sectors including textiles/RMG; contact persons: Anouschka Jansen, Senior Manager, Milan Pajic (Trade & Sustainability Advisor),	INT
Bangladesh Environmental Lawyers Association (BELA) www.belabangla.org	Bangladesh	Non-profit legal organization promoting environmental justice, creating environmental awareness and transparency, and contributing towards the development of environmental jurisprudence, contact person: Ms. Syeda Rizwana Hasan, Director	NGO
Business Initiative Leading Development (BUILD) http://www.buildbd.org/	Bangladesh	Platform for fact-based and research-backed dialogue and advocacy, with objective of identifying investment climate constraints and recommending changes to laws, policies and regulations in order to unlock growth potential of the country's private sector including leather, functioning as the bridge between the public and private sector (in particular SMEs) for better communication, coordination and collaboration in bringing reforms in business policies and procedures to improve the	NGO

		country's investment climate in Bangladesh; involved in SCP road mapping consultations; contact person: Ferdaus Ara Begum (Chief Executive Officer)	
Clean Clothes Campaign https://cleanclothes.org	Europe	Network of members (trade unions, NGOs) committed to improve and strengthen textile workers' rights, propagating labelling and transparency, contact person.	NGO
Fair Wear Foundation-European Initiative www.fairwear.org	Europe	Providing network of brands that commit to improve labour conditions in the textile industry, working with garment brands, factories, trade unions, NGOs and governments to improve working conditions for garment workers in 11 production countries across Asia, Europe and Africa. contact person: Alexander Kohnstamm, Executive Director, local representatives in several Asian countries	NGO
Fashion Revolution www.fashionrevolution.org	Europe	Movement involved in compiling annual "Fashion Transparency Index" reviewing and ranking 200 of the biggest global fashion and apparel brands and retailers according to level of disclosure about their suppliers, supply chain policies and practices, and social and environmental impact; contact person: Carry Somers, Founder and Global Operations Director	NGO
Solidaridad Network www.solidaridadnetwork.org/	Europe	International network organization Dutch with worldwide regional centre in the world, presently working in Myanmar, Pakistan and Bangladesh on textile related issues; involved in leather related issues in India (Kanpur cluster) as well as Bangladesh; contact persons: Selim Reza Hasan (Bangladesh), Sebastian Taylor (Myanmar)	NGO
National Cleaner Production Center Sri Lanka www.ncpcsrilanka.org/	Sri Lanka	Foremost provider of sustainable production solutions in Sri Lanka; partnerships with international agencies such as UN Environment, UNIDO, EU Switch Asia, GIZ, GEF and many more to facilitate a stronger sustainability exposure and knowledge sharing locally; involved in advancing sustainability performance in selected industrial sectors; likely	NGO

		to be tasked with taking over continuation of EU-SWITCH SCP Policy component; contact person: Samantha Kumarasena, Director	
GIZ Textile Cluster Programme	Bangladesh	German government funded programme dedicated to propagating social, labour, safety & health and environmental standards in the textile/garment and leather sector in Bangladesh as well as enhancing education on sector specific SCP subjects and access to funding for safety retrofits and upgrades; supporting sustainable road map development processes and certification through sector associations; contact person: Werner Lange, werner.lange@giz.de	PRO
“Sustainable Textile Production and EcoLabelling in Mongolia” (STeP EcoLab Mongolia) https://www.scp-centre.org/our-work/step/	Mongolia	EU supported initiative, focusing on sustainable textile production and eco-Labeling in Mongolia; partnership between Agronomes et Veterinaires Sans Frontieres, National Association of Pasture User Groups, Mongolian Wool and Cashmere Association and Environment and Security Center of Mongolia; contact persons: Quentin Moreau and Pawel Zylka	PRO
SMART Myanmar www.smartmyanmar.org/en	Myanmar	SMART Myanmar, funded by the EU, initiative building on the initial EU-SWITCH SMART project implemented between 2013-2015, actively supporting and promoting sustainable consumption and production (SCP) of garments “Made in Myanmar” emphasising on resource efficiency and social responsibility with local and international partners; contact person: Jacob A. Clere, Team Leader	PRO
2030 Water Resources Group www.2030wrg.org	Regional	Initiative by World Bank/IFC, active amongst others in Bangladesh, India, Mongolia and Vietnam mostly working on water issues in agriculture, farming, mining and manufacturing including textile and leather sector, promoting integrated water resources management to arrive at optimal solutions at the regional and national levels; contact person: Rochi Khemka (Global Partnerships Coordinator/Asia Regional WRM Specialist)	PRO

<p>GIZ's Social & Labour Standards in the Textile and Garment Sector in Asia (SLSG & FABRIC)</p>	<p>Regional</p>	<p>German government supported regional initiative dedicated to propagating social and labour standards in the Asian textile and garment sector, covering Bangladesh, Cambodia, China, Myanmar and Pakistan; up-coming phase (renamed as FABRIC) focusing on social, safety & health and environmental issues (e.g. water, wastewater and chemicals management); contact person: Marc Beckmann, Beckmann, head of programme, marc.beckmann@giz.de</p>	<p>PRO</p>
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