SITRA STUDIES 219

SEPTEMBER 2022

CIRCULAR INNOVATION AND ECODESIGN IN THE TEXTILES SECTOR

Towards a sustainable and inclusive transition

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Towards a sustainable and inclusive transition

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The author expresses thanks to Malena Sell for numerous discussions that have guided this research and for the opportunity to develop this study. The author is also grateful to Graduate Institute students Diana Opik, Osione Oseni-Elamah, Akshaya Venkataraman, and Victor Santos Mariottini De Oliveira, and supervisors Phattharaphong Saengkrai and Elena Cima for producing an excellent analysis as part of the LLM Clinical Program at the Graduate Institute . Further thanks go to Michelle Moraa and Brock Burton for great research assistance, and to Kimberley Botwright for very helpful comments as part of the peer review process.

ISBN 978-952-347-272-3 (PDF) www.sitra.fi
ISSN 1796-7112 (PDF) www.sitra.fi

PunaMusta Oy, Helsinki 2022

The SITRA STUDIES publication series features the results of Sitra's future-oriented work and experiments.

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Abbreviations

BGMEA	Bangladesh Garment Manufacturers and Exporters Association
CEAP	Circular Economy Action Plan
CEPA	Comprehensive Economic Partnership Agreement
CFP	Circular Fashion Partnership
CMT	Cut-make-trim
EBA	Everything but Arms
EPR	Extended Producer Responsibility
EU	European Union
EVFTA	EU-Vietnam Free Trade Agreement
EVP	Vietnam Environmental Protection
ESPR	Ecodesign for Sustainable Products
GHG	Greenhouse gas
GFA	Global Fashion Agenda
GSP	Generalised System of Preferences
LDC	Least-developed country
LEED	Leadership in Energy and Environmental Design
ICT	Information and communications technology
NTB	Non-tariff barrier
P4G	Partnerships for Green Growth
RMG	Ready-made garments
RR	Reverse Resources
RTA	Regional Trade Agreement
SLITA	Sri Lanka Institute Textile and Apparel
SPI	Sustainable Products Initiative
SSCT	Strategy for Sustainable and Circular Textiles
TBT	Technical barriers to trade
UNFCCC	United Nations Fashion Industry Charter for Climate Action
VITAS	Vietnam Textile and Apparel Association
VSS	Voluntary Sustainability Standards
WSR	Waste Shipment Regulation

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Foreword

The world is facing climate change, biodiversity loss and the depletion of natural resources, exacerbated by our production and consumption patterns. Transforming from the current linear economic model to a circular economy is vital to solving the sustainability crisis.

The textiles and apparel industry has a high environmental footprint, and the current production and distribution system is almost completely linear. Fast fashion – speed and volume – has become the norm over the last couple of decades. Moreover, textile production and consumption are expected to triple by 2050.

The need for change is acute and increasingly acknowledged by both consumers and regulators. The circular economy opens up entirely new opportunities in the textiles sector, ranging from the design and production of long-lasting, repairable clothes to new service models such as clothing rental. Exciting technological innovations are ushering in secondary fibres of premium quality, while production itself is becoming more resource-efficient and sustainable.

Many big brands, driven by consumer pressure, are leading the way in rethinking their operations. While they are setting new trends, circularity needs to become mainstream to provide the necessary scale and impact across the globe.

In this regard, the EU is a pioneer when it comes to regulation. Under its Circular Economy Action Plan (CEAP), circular products – including textiles – are set to become the norm on the European market, something that will have a bearing on all international markets. While regulatory development is at a very early stage, textiles is one of the sectors for which the EU is starting to work out new norms and practices under the CEAP.

Value chains in the textiles sector are notably international. The EU and other developed countries are major consumers and importers, while a significant part of the large-scale production takes place in developing countries. In fact, the EU imports just over half its textiles and apparel. The successful uptake of new circularity requirements in producer countries will be key to ensuring both global and local environmental benefits as well as opening up valuable new markets and creating jobs. This will not happen by default, however, but requires strategic planning and policy coherence.

Therefore, the Finnish Innovation Fund Sitra asked Colette van der Ven, a trade lawyer and sustainability specialist, to look into the specific and practical details of how circularity could be implemented in the textiles sector under current trade regimes, drawing on three different case studies: Bangladesh, Sri Lanka and Vietnam. This report provides her groundbreaking analysis and vision for how trade arrangements with the EU could be leveraged to support the transition, offering producer countries targeted technical support and investment while minimising the risk of new trade barriers. Producer-country governments, as well as the private sector, will also play key roles.

We hope that this study will raise awareness of the opportunities the circular economy offers for the textiles sector, and we hope to see policymakers and different organisations utilising the results.

Helsinki, September 2022

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Executive summary

In March 2022, the European Commission submitted a proposal for a regulation for Ecodesign for Sustainable Products (ESPR) (European Commission, 2022d). The proposal establishes a framework for ecodesign requirements that can be applied to specific product groups to enhance their durability and sustainability. These requirements, which will apply to most products produced and consumed in the EU, will have important economic implications for developing countries that rely on the EU as a key import market. On the one hand, they can incentivise trading partners to improve circularity in their production. On the other hand, they can become non-tariff barriers for developing countries that are unable to comply with the requirements of the ESPR, implicating preferential market access many developing countries enjoy as part of the Generalised System of Preference (GSP) scheme when exporting to the EU.

To better understand both the implications of the ESPR on developing countries and the associated challenges and opportunities, this paper zooms in on textile and apparel exporting countries – an industry that has been a critical part of many developing countries' industrialisation trajectories and comprises a significant percentage of developing country exports to the EU. Specifically, based on three case studies that focus on Bangladesh, Sri Lanka, and Vietnam, this study has sought to better understand the following:

1. ongoing circular economy initiatives in the textiles and apparel industry and the challenges and untapped opportunities in the countries studied
2. the alignment/misalignment between the situation in case studies and the ESPR requirements
3. ways in which regional trade agreements (RTAs) and unilateral preference schemes can be leveraged to address identified challenges and tap into the identified opportunities.

Circular economy initiatives, challenges and opportunities in textile and apparel in Bangladesh, Vietnam and Sri Lanka

A number of high-level observations can be drawn based on the three case studies.

Private vs public sector: Most of the circular textile and apparel initiatives in the three countries studied are spearheaded by the private sector, often supported by donor-led initiatives. In each of the three countries studied, voluntary sustainability standards play an important role. This is, in part, because many companies in the countries studied are foreign owned, with brands pushing for their operations to become more environmentally sustainable. There is, however, a notable absence of government involvement in establishing textile waste recycling incentives.

Cotton vs synthetic: Countries' circular economy initiatives differ depending on the industry characteristics. For example, in Bangladesh, cotton recycling presents a large untapped opportunity due to the prevalence of 100% cotton waste which is easy to recycle. By contrast, both Sri Lanka and Vietnam rely on a mixture of cotton and synthetic, as well as blended materials. These blends require significant efforts in sorting and separating and typically contain many chemicals or accessories. This makes it much more difficult to recycle. In these countries, circular efforts should focus on improved product design that would facilitate recyclability, as well as on adopting incentives to

attract investments in adequate recycling machinery and technology.

Process vs product: Another interesting observation is that circular economy initiatives adopted in the countries studied focus on enhancing circularity in the *production process* itself, either through waste management or reducing resource inputs in the production process. These initiatives seek to reduce the environmental footprint of the product. They do not, however, focus on making the *product* itself more circular, through enhancing reusability and recyclability in the way the product is designed. This is important for three key reasons:

1. Most of the value added will take place in upstream design activities – not waste management activities
2. 80 per cent of the environmental impacts of a product are determined at the design phase
3. The ESPR focuses on the circular characteristics of the product itself, not the production process.

Alignment/ misalignment with the ESPR

Various gaps exist between circular textile and apparel initiatives adopted in the countries studied and the ESPR requirements. To begin, most circular textile and apparel initiatives analysed are in their infancy and often spearheaded by the private sector. This means that examples of circular production tend to be the exception and not the norm. Moreover, while most developing countries' circular textiles and apparel initiatives focus on production processes, the ESPR predominantly focuses on product characteristics. This suggests a mismatch: even if a product has been produced with fewer water inputs, or even if post-industrial waste has been recycled, it does not per se render the product itself more circular in accordance with what would be required by the ESPR.

Another important gap concerns material traceability: the ESPR envisages the introduction of a digital product passport that would contain information about the product's content, including the percentage of recyclable material. Product traceability in the countries studied is very poor, especially with regard to post-industrial waste tracking given that this is often in the hands of the informal sector.

Ensuring that imported textile and apparel products comply with the ESPR will require great levels of commitment, including from the EU, developing countries' governments, the private sector and donor organisations. Certain priority areas have been identified to enhance the link between developing countries' circularity initiatives and the ESPR.

- Develop a strategic approach to developing a circular textiles and apparel industry /adopt appropriate regulatory framework.
- Ensure circular initiatives are not limited to waste management, but also focus on product design and developing alternative and recycled fibres.
- Promote and facilitate circular investments and investments of relevance to circular textiles and apparel.
- Increase access to critical technologies necessary to advance the transition to a circular textile industry; including in recycling systems and innovations in nature-based fibre.
- Invest in skills development, through capacity building.
- Reduce the risk that the ESPR becomes a non-tariff barrier, including through mutual recognition.
- Enhance product traceability in the textile and apparel supply chain – both with respect to material tracing and overall trade transparency.

Leveraging regional trade agreements (RTAs) and unilateral preference schemes to address challenges and tap into opportunities

RTAs can be leveraged to advance circular economy opportunities in developing countries, including by strategically targeting investment, improving technology transfer including through joint ventures, lowering barriers to goods and services relevant to transitioning towards circular textiles industries and reducing trade friction that could result from the ESPR. In particular, it would be interesting to explore to what extent voluntary sustainability standards (VSS) could be considered equivalent to government standards/technical regulations through TBT provisions. Indeed, companies that have been certified by a variety of sustainability standards will be likely to experience fewer difficulties in meeting ESPR requirements. Moreover, for an inclusive and just transition to circular textiles, targeted technical assistance will be indispensable.

A key take-away is that RTAs, when approached strategically, can facilitate a developing country's transition to circular textiles. A prerequisite to doing so involves identifying the specific opportunities and challenges in the country's textile and apparel industry, as well as any comparative advantage a country may have with respect to the circular economy as applied to the textile and apparel sector. As circular economy roadmaps and policies identifying the opportunities and challenges specific to circular apparel and textile are lacking in many developing countries, this should be a key focus of technical assistance co-operation. Sharing information about best practices would be one way for RTAs to facilitate this. Another way to do so would be by focusing on capacity building through developing skill sets in areas such as post-industrial waste management, ecodesign, product traceability and general infrastructure support.

RTAs are not the only vehicle for enhancing circularity in textiles and apparel industries and ESPR compliance. In the context of unilateral preference programmes, regulatory coherence between the EU's GSP scheme and the ESPR ecodesign requirements can be improved by making available a budget to facilitate compliance with the ESPR for those GSP beneficiaries whose EU exports of textile and apparel products comprise 50% or more of the country's total EU GSP exports. In addition, given that design and other high-value activities related to the apparel and textile value chain are typically in the hands of multinational companies, the private sector can play a critical role in catalysing the transition to circular textiles in developing countries. This can be done through technology transfer as a result of joint ventures between international brands and local businesses and by ensuring that international clothing brands that invest in developing countries are in a position to produce products that comply with the ESPR standards.

Finally, it would be critical to reflect some of the observations made in this study in the ESPR itself, including the yet-to-be developed delegated act for textiles and apparel. This could be done by building in special and differential treatment provisions allowing developing countries more flexible transition times. It would similarly be critical that the process for developing the delegated act for textiles and apparel includes stakeholders from key apparel and textile-producing countries exporting to the EU, both from the public and private sector.

Tiivistelmä

Maaliskuussa 2022 komissio antoi esityksen kestävien tuotteiden ekologista suunnittelua koskevasta asetuksesta (ESPR) (Euroopan komissio 2022d). Ehdotus sisältää ekologisen suunnittelun vaatimusten viitekehyksen, jota voidaan soveltaa tiettyihin tuoteryhmiin niiden kestävyyden ja vastuullisuuden parantamiseksi. Näillä vaatimuksilla, jotka koskevat useimpia EU:ssa valmistettuja ja käytettyjä tuotteita, on merkittäviä taloudellisia seuraamuksia kehitysmaille, joiden keskeinen tuontimarkkina EU on. Toisaalta ne voivat kannustaa kauppakumppaneitaan parantamaan kiertotaloutta tuotannossaan. Toisaalta taas niistä voi tulla tullien ulkopuolisia esteitä kehitysmaille, jotka eivät pysty noudattamaan ESPR:n vaatimuksia. Tämä vaikuttaa etuuskohteluun perustuvaan markkinoille pääsyyn, josta monet kehitysmaat nauttivat osana kehitysmaiden yleistä tullietuusjärjestelmää (GSP) viedessään tuotteita EU:n alueelle.

Jotta ESPR:n vaikutukset kehitysmaihin ja niihin liittyvät haasteet ja mahdollisuudet ymmärrettäisiin paremmin, tämä julkaisu keskittyy lähemmin tekstiilejä ja vaatteita vieviin maihin. Tämä toimiala on ollut kriittinen osa monien kehitysmaiden teollistumisessa ja muodostaa merkittävän osuuden kehitysmaiden EU-viennistä. Erityisesti kolmen Bangladeshiin, Sri Lankaan ja Vietnamiin keskittyvän tapaustutkimuksen perusteella tämä tutkimus pyrkii lisäämään ymmärrystä seuraavista asioista:

1. käynnissä olevat kiertotalouden hankkeet tekstiili- ja vaatealalla, tutkittujen maiden haasteet ja hyödyntämättömät mahdollisuudet
2. tapaustutkimusten tilanteen ja ESPR-vaatimusten välisen yhdenmukaisuuden tai ristiriidan
3. tavat, joilla alueellisia kauppasopimuksia (RTA:t) ja yksipuolisia etuusjärjestelmiä voidaan hyödyntää tunnistettujen haasteiden ratkaisemiseen ja mahdollisuuksien hyödyntämiseen.

Kiertotalouden hankkeet, haasteet ja mahdollisuudet tekstiileissä ja vaatteissa Bangladeshissa, Vietnamissa ja Sri Lankassa

Kolmen tapaustutkimuksen perusteella voidaan tehdä monia ylätason havaintoja.

Yksityinen vs. julkinen sektori: Useimmat kiertotalouden mukaiset tekstiili- ja vaatehankkeet tutkituissa kolmessa maassa ovat yksityisen sektorin vetämiä, usein lahjoittajien johtamien hankkeiden tukemina. Jokaisessa kolmesta tutkitusta maasta vapaaehtoisilla vastuullisuusnormeilla on tärkeä rooli. Tämä johtuu osittain siitä, että monet tutkituissa maissa toimivista yrityksistä ovat ulkomaalaisomistuksessa, ja brändit pyrkivät tekemään toiminnastaan ympäristön kannalta vastuullisempaa. Tekstiilijätteen kierrätyshankkeiden perustamisessa on kuitenkin selvästi havaittavissa valtiovetoisten hankkeiden puuttuminen.

Puuvilla vs. synteettiset kuidut: Maiden kiertotaloushankkeet eroavat teollisuuden ominaisuuksien mukaan. Esimerkiksi Bangladeshissa puuvillan kierrättäminen on suuri hyödyntämätön mahdollisuus helposti kierrätettävän sataprosenttisen puuvillajätteen runsauden vuoksi. Sri Lankassa ja Vietnamissa puolestaan käytetään puuvillan

ja synteettisten materiaalien seosta ja sekoitemateriaaleja. Nämä seokset edellyttävät merkittävää lajittelua ja erottelua, ja niissä on tyypillisesti monia kemikaaleja tai lisätarvikkeita. Sen vuoksi niiden kierrättäminen on paljon vaikeampaa. Näissä maissa kiertotaloustoimien tulisi keskittyä kierrätettävyyttä helpottavaan parempaan tuotesuunnitteluun sekä hankkeisiin, jotka houkuttelevat investointeja riittävään kierrätyskoneistoon ja teknologiaan.

Prosessi vs. tuote: Toinen kiinnostava havainto on, että tutkituissa maissa kiertotaloushankkeet keskittyvät kiertotalouden edistämiseen itse *valmistusprosessissa* joko jätehuollon tai tuotantoprosessin resurssisyötteiden vähentämisen kautta. Nämä hankkeet pyrkivät pienentämään tuotteen ympäristöjalanjälkeä. Ne eivät kuitenkaan keskity itse *tuotteen* kiertotalousominaisuuksien parantamiseen uudelleenkäytettävyyden ja kierrätettävyyden parantamisen kautta tuotteen suunnittelun avulla. Tämä on tärkeää kolmen keskeisen syyn vuoksi:

1. Suurin osa lisäarvosta syntyy alkupään suunnittelussa – ei jätehuollossa.
2. 80 prosenttia tuotteen ympäristövaikutuksista määräytyy suunnitteluvaiheessa.
3. ESPR keskittyy itse tuotteen kiertotalousominaisuuksiin, ei tuotantoprosessiin.

Yhdenmukaisuus ja ristiriidat ESPR:n kanssa

Tutkituissa maissa käyttöönotettujen tekstiilien ja vaatteiden kiertotaloushankkeiden ja ESPR-vaatimusten välillä on useita eroavaisuuksia. Ensinnäkin suurin osa analysoiduista tekstiilien ja vaatteiden kiertotaloushankkeista on alkuvaiheessa ja usein yksityisen sektorin vetämiä. Tämä tarkoittaa, että kiertotalouden mukaisen tuotannon esimerkit ovat ennemminkin poikkeus kuin sääntö. Lisäksi vaikka useimpien kehitysmaiden tekstiilien ja vaatteiden kiertotaloushankkeet keskittyvät tuotantoprosessiin, ESPR keskittyy pääasiassa tuotteen ominaisuuksiin. Tämä johtaa ristiriitaan: vaikka tuote olisi valmistettu vähemmän vettä käyttäen tai vaikka valmistuksesta syntyvä jäte kierrätettäisiin, se ei itsessään tee tuotteesta enemmän kiertotalouden periaatteiden mukaista sen mukaan, mitä ESPR vaatisi. Toinen merkittävä aukko koskee materiaalin jäljitettävyyttä: ESPR:ssä kaavaillaan käyttöön otettavaksi digitaalista tuotepassia, jossa olisi tietoa tuotteen sisällöstä, mukaan luettuna kierrätettävissä olevan materiaalin osuudesta. Tuotteen jäljitettävyys tutkituissa maissa on erittäin heikkoa, erityisesti mitä tulee tuotantojätteeseen, sillä se on usein epävirallisen sektorin käsissä.

Maahantuotujen tekstiili- ja vaatetuotteiden yhdenmukaisuus ESPR:n kanssa vaatii paljon sitoutumista, mukaan luettuna EU:lta, kehitysmaiden hallituksilta, yksityiseltä sektorilta ja avunantajajärjestöiltä. Tiettyjä painopistealueita on tunnistettu kehitysmaiden kiertotaloushankkeiden ja ESPR:n välisen yhteyden parantamiseksi:

- Strategisen lähestymistavan kehittäminen kiertotalouden mukaisen tekstiili- ja vaateteollisuuden kehittämiseksi sekä asianmukaisen sääntelyn käyttöönottamiseksi.
- Sen varmistaminen, etteivät kiertotaloushankkeet rajoitu jätehuoltoon, vaan keskittyvät myös tuotesuunnitteluun ja vaihtoehtoisten ja kierrätettyjen kuitujen kehittämiseen.
- Kiertotalousinvestointien sekä kiertotalouden mukaisten tekstiilien ja vaatteiden kannalta olennaisten investointien edistäminen ja mahdollistaminen.
- Kiertotalouden mukaiseen tekstiiliteollisuuteen siirtymisen edistämiseksi

tarvittavien kriittisten teknologioiden saatavuuden parantaminen myös kierrätysjärjestelmissä sekä innovaatiot luonnonkuiduissa.
- Investoinnit osaamisen kehittämiseen kapasiteetin rakentamisen kautta.
- Sen riskin vähentäminen, että ESPR:stä tulee tullien ulkopuolinen este, mukaan luettuna vastavuoroisen tunnustamisen kautta.
- Tuotteiden jäljitettävyyden parantaminen tekstiilien ja vaatteiden toimitusketjussa – sekä materiaalien jäljitettävyyden että kaupan yleisen läpinäkyvyyden osalta.

Alueellisten kauppasopimusten (RTA:t) ja yksipuolisten etuusjärjestelmien hyödyntäminen haasteiden ratkaisemiseksi ja tunnistettujen mahdollisuuksien hyödyntämiseksi

RTA:ita voidaan hyödyntää kiertotalouden mahdollisuuksien edistämiseen kehitysmaissa myös strategisesti kohdistetuilla investoinneilla, teknologiasiirtojen parantamisella yhteisyritysten kautta, vähentämällä kiertotalouden mukaiseen tekstiiliteollisuuteen siirtymisen kannalta olennaisten tuotteiden ja palveluiden esteitä sekä vähentämällä ESPR:n mahdollisesti aiheuttamaa kaupan kitkaa. Olisi erityisen kiinnostavaa tutkia, missä määrin vapaaehtoisia vastuullisuusnormeja voitaisiin pitää kansallisia normeja ja teknisiä säädöksiä vastaavina kaupan teknisiä esteitä koskevien määräysten kautta. Erilaisten vastuullisuusnormien kautta sertifioiduilla yrityksillä on itse asiassa todennäköisesti vähemmän ongelmia ESPR-vaatimusten täyttämisessä. Lisäksi kohdistettu tekninen apu on korvaamattoman arvokasta, jotta siirtymä kiertotalouden mukaisiin tekstiileihin mahdollistaisi osallistumisen ja olisi oikeudenmukainen.

Keskeinen löydös on, että RTA:t voivat strategisesta näkökulmasta edistää kehitysmaiden siirtymää kiertotalouden mukaisiin tekstiileihin. Tämän edellytyksenä on, että tunnistetaan maan tekstiili- ja vaateteollisuuden erityiset mahdollisuudet ja haasteet sekä mahdolliset vertailuedut, joita maalla voi olla kiertotalouden osalta tekstiili- ja vaatealalla. Teknisen avustusyhteistyön keskeisten painopisteen tulisi olla kiertotalouden tiekartat ja käytännöt, jotka tunnistavat erityisesti kiertotalouden mukaisiin vaatteisiin ja tekstiileihin liittyvät, monista kehitysmaista puuttuvat mahdollisuudet ja haasteet. Parhaita käytäntöjä koskevan tiedon jakaminen olisi yksi tapa, jolla RTA:t voisivat edistää tätä. Toinen tapa olisi keskittyä kapasiteetin rakentamiseen, niin että kehitetään osaamista esimerkiksi teollisuusjätehuollossa, ekologisessa suunnittelussa ja tuotteiden jäljitettävyydessä, sekä yleinen infrastruktuurin tukeminen.

RTA:t eivät ole ainoa keino kiertotalouden ja ESPR:n vaatimusten mukaisuuden edistämiseen tekstiili- ja vaatealalla. EU:n GSP-järjestelmä tarjoaa yksipuolisesti kehittyville maille etuja EU:n markkinoille pääsyssä. EU:n GSP-järjestelmän ja ESPR:n ekologista suunnittelua koskevien vaatimusten yhdenmukaisuutta voidaan parantaa budjetoimalla kehitysapua ESPR-yhdenmukaisuuden edistämiseksi niille GSP-edunsaajille, joiden tekstiilien ja vaatteiden EU-viennin osuus maan GSP-kokonaisviennistä EU:n alueelle on vähintään 50 prosenttia.

Lisäksi kun otetaan huomioon, että suunnittelu ja muut vaatteiden ja tekstiilien arvoketjuun liittyvät suuren lisäarvon toiminnot ovat tyypillisesti monikansallisten yhtiöiden käsissä, yksityisellä sektorilla voi olla ratkaisevan tärkeä rooli kiertotalouden mukaisiin tekstiileihin siirtymisessä kehitys-

maissa. Tämä voidaan toteuttaa teknologiasiirrolla kansainvälisten tuotemerkkien ja paikallisten toimijoiden yhteisyritysten seurauksena ja varmistamalla, että kehitysmaihin investoivat kansainväliset vaatemerkit ovat valmiita tuottamaan ESPR-normeja vastaavia tuotteita.

Lopuksi olisi ratkaisevan tärkeää pohtia joitakin havaintoja, joita tässä tutkimuksessa on tehty itse ESPR:ään liittyen, mukaan lukien tuleva tekstiilejä ja vaatteita koskeva delegoitu säädös. Tämä tapahtuisi kehittämällä erityis- ja erilliskohtelun säännökset, jotka sallisivat kehitysmaille joustavammat siirtymäkaudet. Olisi vastaavasti tärkeää, että tekstiilejä ja vaatteita koskevan delegoidun säädöksen laatimisprosessiin otetaan mukaan sidosryhmiä keskeisistä vaatteita ja tekstiilejä tuottavista EU:hun vievistä maista sekä julkiselta että yksityiseltä sektorilta.

Sammanfattning

I mars 2022 lade kommissionen fram ett förslag till förordning om ekodesign för hållbara produkter (ESPR) (Europeiska kommissionen, 2022d). Förslaget etablerar ett ramverk för krav på ekodesign som kan tillämpas på specifika produktgrupper i syfte att förbättra deras varaktighet och hållbarhet. Dessa krav, som kommer att gälla för de flesta produkter som produceras och konsumeras inom EU, kommer att få viktiga ekonomiska konsekvenser för utvecklingsländer som förlitar sig på EU som en viktig importmarknad. Å ena sidan kan de uppmuntra handelspartner att förbättra cirkulariteten i sin produktion. Å andra sidan kan de bli icke-tariffära hinder för utvecklingsländer som inte kan uppfylla kraven i ESPR. Det är speciellt relevant för utvecklingsländer som vilket erhåller förmånligt marknadstillträde som en del av det allmänna preferenssystemet (GSP) när de exporterar till EU.

För att bättre förstå både ESPR:s konsekvenser för utvecklingsländer och de associerade utmaningarna och möjligheterna, koncentrerar man sig i detta dokument på textil- och klädexporterande länder – en industri som har varit en kritisk del av många utvecklingsländers industrialiseringsbanor och som utgör en betydande andel av utvecklingsländernas EU:s export. Specifikt, baserat på tre fallstudier som fokuserar på Bangladesh, Sri Lanka och Vietnam, har denna studie försökt att bättre förstå följande:

1. pågående initiativ gällande cirkulär ekonomi inom textil- och klädindustrin, utmaningar och outnyttjade möjligheter i de studerade länderna
2. överensstämmelse/icke-överensstämmelse mellan situationen i fallstudier och ESPR-kraven
3. sätt på vilka regionala handelsavtal (RTA) och unilaterala preferenssystem kan utnyttjas för att hantera identifierade utmaningar och utnyttja de identifierade möjligheterna.

Initiativ gällande cirkulär ekonomi, utmaningar och möjligheter inom textil och kläder i Bangladesh, Vietnam och Sri Lanka

Ett antal observationer på allmän nivå kan göras utifrån de tre fallstudierna.

Privat kontra offentlig sektor: De flesta av de cirkulära textil- och klädinitiativen i de tre studerade länderna leds av den privata sektorn, ofta med stöd av givarledda initiativ. I vart och ett av de tre studerade länderna spelar frivilliga hållbarhetsstandarder en viktig roll. Detta beror, delvis, på att många företag i de studerade länderna är utlandsägda, med varumärken som driver på för att deras verksamhet ska bli mer miljömässigt hållbar. Det finns dock en anmärkningsvärd avsaknad av statligt engagemang för att skapa incitament för återvinning av textilavfall.

Bomull kontra syntet: Ländernas cirkulära ekonomiinitiativ skiljer sig åt beroende på industriernas särdrag. I till exempel Bangladesh har bomullsåtervinning en stor outnyttjad möjlighet på grund av förekomsten av 100-procentigt bomullsavfall som är lätt att återvinna. Däremot förlitar sig både Sri Lanka och Vietnam på en mix av bomull och syntetiska material, liksom blandmaterial. Dessa blandningar kräver betydande ansträngningar för att sorteras och separeras

och innehåller vanligtvis många kemikalier eller tillsatser. Det gör att de är mycket svårare att återvinna. I dessa länder bör cirkulära ansträngningar fokusera på förbättrad produktdesign som skulle underlätta återvinningsbarhet, samt på att ta i bruk incitament för att attrahera investeringar i lämpliga återvinningsmaskiner och -teknik.

Process kontra produkt: En annan intressant observation är att initiativ för cirkulär ekonomi som antagits i de studerade länderna fokuserar på att öka cirkulariteten i själva *produktionsprocessen*, antingen genom avfallshantering eller genom att minska resursinsatserna i produktionsprocessen. Dessa initiativ syftar till att minska produktens miljöavtryck. De fokuserar dock inte på att göra själva *produkten* mer cirkulär genom att förbättra återanvändbarhet och återvinningsbarhet genom sättet som produkten är utformad. Detta är viktigt av tre avgörande skäl:

1. Det mesta av mervärdet kommer att ske i designaktiviteter uppströms – inte i aktiviteter gällande avfallshantering
2. 80 procent av en produkts miljöpåverkan avgörs i designfasen
3. ESPR fokuserar på de cirkulära egenskaperna hos själva produkten, inte på produktionsprocessen.

Överensstämmelse / icke-överensstämmelse med ESPR

Det finns tydliga olikheter mellan cirkulära textil- och klädinitiativ som antagits i de studerade länderna och ESPR-kraven. Till att börja med är de flesta cirkulära textil- och klädinitiativ som analyserats i sin linda, och pådrivs ofta av den privata sektorn. Det betyder att exempel på cirkulär produktion tenderar att vara undantag och inte norm. Dessutom, medan de flesta utvecklingsländers cirkulära textil- och klädinitiativ fokuserar på produktionsprocessen, fokuserar ESPR övervägande på produktens egenskaper. Detta tyder på en felmatchning: även om en produkt har producerats med mindre vattenförbrukning, eller även om postindustriellt avfall har återvunnits, gör detta inte själva produkten i sig mer cirkulär i enlighet med vad som skulle krävas av ESPR. En annan viktig klyfta gäller materialspårbarhet: ESPR kommer att kräva införandet av ett digitalt produktpass som skulle innehålla information om produktens innehåll, inklusive andelen återvinningsbart material. Produktspårbarheten i de studerade länderna är mycket svag, särskilt när det gäller postindustriell avfallsspårning på grund av att detta ofta ligger i händerna på den informella sektorn.

För att importerade textil- och klädprodukter ska uppfylla ESPR kommer det att krävas höga nivåer av engagemang, inklusive från EU, utvecklingsländernas regeringar, den privata sektorn och givarorganisationer. Vissa prioriterade områden har identifierats för att förbättra kopplingen mellan utvecklingsländernas cirkulära initiativ och ESPR:

- Anta ett strategiskt tillvägagångssätt för att utveckla en cirkulär textil- och klädindustri och anta ett lämpligt regelverk.
- Säkerställ att cirkulära initiativ inte är begränsade till avfallshantering, utan fokusera även på produktdesign och utveckling av alternativa och återvunna fibrer.
- Främja och underlätta cirkulära investeringar och investeringar som har relevans för cirkulära textiler och klädesplagg.
- Öka åtkomsten till kritisk teknik som är nödvändig för att främja övergången till en cirkulär textilindustri; inklusive i återvinningssystem, samt innovationer inom naturbaserad fiber
- Satsa på kompetensutveckling genom kapacitetsuppbyggnad.

- Minska risken för att ESPR blir ett icke-tariffärt hinder, bland annat genom ömsesidigt erkännande.
- Förbättra produkters spårbarhet i textil- och klädförsörjningskedjan – både med avseende på materialspårning och på övergripande handelstransparens.

Utnyttja regionala handelsavtal (RTA:er) och unilaterala preferenssystem för att möta utmaningar och utnyttja möjligheter

Regionala handelsavtal kan utnyttjas för att främja möjligheter till cirkulär ekonomi i utvecklingsländer, inklusive genom att strategiskt rikta investeringar, förbättra tekniköverföring, inklusive genom joint ventures, sänka barriärer för varor och tjänster som är relevanta för övergången till cirkulära textilindustrier, och minska handelsfriktioner som kan bli resultatet av ESPR. Särskilt skulle det vara intressant att undersöka i vilken utsträckning frivilliga hållbarhetsstandarder (VSS) kan anses likvärdiga med statliga standarder och tekniska föreskrifter via TBT-bestämmelser. Faktum är att företag som har certifierats enligt en mängd olika hållbarhetsstandarder sannolikt kommer att uppleva mindre svårigheter att uppfylla ESPR-kraven. För en inkluderande och rättvis övergång till cirkulära textilier kommer dessutom ett riktat tekniskt bistånd vara oumbärligt.

En viktig faktor är att regionala handelsavtal, när de närmas strategiskt, kan underlätta ett utvecklingslands övergång till cirkulära textilier. En förutsättning för att göra detta involverar att identifiera specifika möjligheter och utmaningar i landets textil- och klädindustri, såväl som eventuella komparativa fördelar som ett land kan ha med avseende på den cirkulära ekonomin som tillämpas på textil- och klädindustrin. Eftersom färdplaner för en cirkulär ekonomi och policyer som identifierar möjligheter och utmaningar som är specifika för cirkulära kläder och textilier saknas i många utvecklingsländer, bör detta vara ett centralt fokus för tekniskt biståndssamarbete. Att dela information om bästa praxis skulle vara ett sätt för regionala handelsavtal att underlätta detta. Ett annat sätt att göra detta skulle vara att fokusera på kapacitetsuppbyggnad genom att utveckla kompetenser inom områden som postindustriell avfallshantering, ekodesign, produktspårbarhet och allmänt infrastrukturstöd.

Regionala handelsavtal är inte det enda verktyget för att förbättra cirkulariteten inom textil- och klädindustrin samt ESPR-efterlevnad. Inom ramen för unilaterala preferensprogram kan regelmässig samstämmighet mellan EU:s GSP-system och ESPR:s krav på ekodesign förbättras. Detta kan göras genom att en budget görs tillgänglig för att underlätta efterlevnaden av ESPR för de GSP-mottagare vars EU-export av textil- och klädprodukter omfattar 50 % eller mer av landets totala EU GSP-export. Med tanke på att design och andra högvärdiga aktiviteter relaterade till värdekedjan för klädesplagg och textilier vanligtvis ligger i händerna på multinationella företag, kan den privata sektorn spela en avgörande roll för att katalysera övergången till cirkulära textilier i utvecklingsländer. Detta kan ske genom tekniköverföring som ett resultat av joint ventures mellan internationella varumärken och lokala företag, och genom att se till att internationella klädmärken som investerar i utvecklingsländerna har möjlighet att producera produkter som uppfyller ESPR-standarderna.

Slutligen skulle det vara avgörande att återspegla några av observationerna i denna studie i själva ESPR, inklusive den delege-

rade akten för textilier och kläder som ännu inte har utvecklats. Detta skulle kunna göras genom att bygga in särskilda och särbehandlande bestämmelser som ger utvecklingsländerna mer flexibla övergångstider. Det skulle på samma sätt vara avgörande att den process i vilken den delegerade akten för textilier och kläder kommer att utvecklas inkluderar intressenter från viktiga kläd- och textilproducerande EU-exportländer, både från den offentliga och privata sektorn.

1 Introduction

Urgent action is required to move towards a more resource-efficient and circular economy. The European Union (EU) Circular Economy Action Plan (CEAP), adopted in March 2020 as part of the Green Deal, outlines various initiatives to move towards a more circular Europe. A central component of the CEAP concerns developing requirements that would ensure that products placed on the EU market are increasingly sustainable and circular (European Commission, 2020a). In March 2022, the European Commission submitted a proposal for a regulation, Ecodesign for Sustainable Products (ESPR) (European Commission, 2022b). The proposal establishes a framework for ecodesign requirements that can be applied to specific product groups to enhance their durability and sustainability.

The European Green Deal, the CEAP and the EU's Industrial Strategy have each identified the textiles and apparel industry as a priority sector through which the EU can pave the way towards a carbon-neutral, circular economy (European Commission, 2021d). This is in part because of its high environmental footprint: in 2020, the consumption of textiles in the EU had the fourth highest impact on the environment and climate change, when taking into account the entire life cycle, the third highest impact on water and land use and the fifth highest in the area of raw material use and greenhouse gas emissions (European Commission, 2022a: 1). Seeking to reduce the harmful environmental effects associated with the textiles and apparel industry, the commission has adopted two strategies to render the textiles and apparel industry more circular. First, as part of the ESPR framework, textile-specific sustainability criteria will be developed. Second, the commission has proposed an EU Strategy for Sustainable and Circular Textiles (SCT Strategy). This strategy seeks to make the EU textiles and apparel industry more competitive and more circular.

From a trade perspective, these proposed policy strategies can be expected to have significant spill-over effects on textiles and apparel exporters to the EU, most of them developing countries. For example, the ESPR could become a non-tariff barrier for developing country businesses that are unable to comply with the more stringent circularity standards. This, in turn, would risk undermining the preferential market access many developing countries enjoy under Generalised System of Preference (GSP) programmes when trading with the EU.

While various high-level policy documents include the notion of ensuring a "just" circular economy transition, the implications of these policy proposals on textile and apparel-producing developing countries in terms of equity and climate justice considerations have not received much attention (Schröder and Wetterberg, 2021). For example, in the more than 1000-page impact assessment carried out to assess the implications of the ESPR, only two pages are devoted to the implications for "third countries" (European Commission, 2022b). Similarly, while the SCT Strategy highlights the importance of "promoting greener and fairer value chains across borders and continents", it falls short of setting out a pathway on how to do so.

This study seeks to better understand the opportunities and challenges of an inclusive

circular economy transition in the textiles and apparel industry.[1] Specifically, it focuses on questions such as: What are the implications of the EU's circular apparel and textiles policy proposals on developing countries exporting textiles and/or apparel products to the EU? How can the ESPR be designed so that that it minimises market access implications for developing countries? And how can regional trade agreements (RTAs) be leveraged to address circular economy challenges and opportunities in developing countries exporting textiles and/or apparel products to the EU?

To answer these questions, this study takes a deep dive into three developing countries that rely heavily on the EU market for textiles and apparel exports: Bangladesh, Vietnam and Sri Lanka. For each of these countries, this study has (i) identified the extent to which public and private initiatives are being pursued to enhance circularity in the textile and apparel industry; (ii) analysed the extent to which these initiatives are aligned – or misaligned – with the proposed ecodesign and performance requirements of the ESPR; and (iii) analysed how trade agreements, the GSPs, technical assistance and other trade-related instruments can be leveraged to mitigate the identified challenges and increase relevant opportunities in developing countries' textiles and apparel industries.

Specifically, this study proceeds as follows. Section 2 explains why it is important to move towards a circular and sustainable textile industry globally and highlights relevant ongoing policy initiatives adopted by the EU to do so. It further explains the importance of ensuring developing countries are involved, due to their position in the global textiles and apparel value chain. Section 3 develops the case studies, identifying specific opportunities and challenges for a circular transition in the textiles and apparel industry in the developing countries analysed. Section 4 analyses how trade policy, as well as EU technical assistance and co-operation frameworks, can be leveraged to ensure that the transition to a circular textiles and apparel industry is just and inclusive of developing countries. Section 5 provides concluding remarks and recommendations on how to ensure an inclusive circular transition in the textiles and apparel sector.

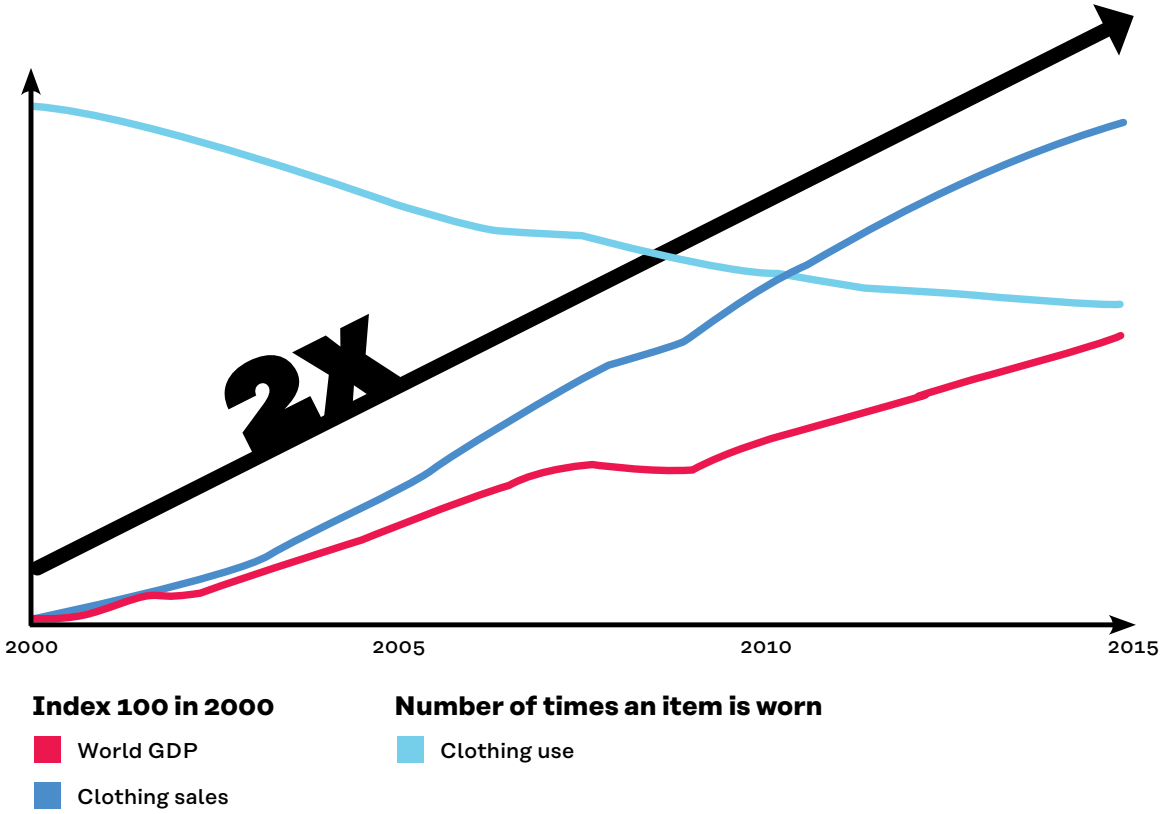
1 This study focuses solely on the environmental aspects of the textile and apparel value chain; questions related to workers' rights and conditions are outside the scope of this study.

2 Circular textiles and apparel: the why, the what and the how

2.1 The "why?": the environmental footprint of the textiles and apparel industry

Over the past 15 years, apparel sales have almost doubled, reflecting the demand from a growing global middle-class population as well as an increase in per capita sales in advanced economies (Ellen MacArthur Foundation, 2017: 18). As illustrated in Figure 1 below, coupled with the increase in clothing sales is a significant decline in clothing use (UNEP, 2020). This is driven by the "fast fashion" phenomenon, which, through quicker turnarounds of new styles, poorer-quality garments and lower prices, is turning apparel into a single-use commodity. The rapid growth of textiles has largely been enabled by synthetic fibres, produced from oils, which over the past 20 years have grown from under 20% of global fibre production to over 60% of production in 2018 (Textile Exchange, 2018, cited in UNEP, 2020).

Figure 1. Growth of clothing sales and decline in clothing use since 2000
Adapted from the Ellen MacArthur Foundation, 2017.



The current system of textile and apparel production and distribution is almost entirely linear. Non-renewable resources, such as oil, fertilisers and chemicals, are extracted and manufactured to produce clothes, which, when discarded, tend to end up in landfills or are incinerated. This process puts pressure on natural resources, degrades ecosystems and generates large amounts of pollution and waste. It is estimated that, when considering the full life cycle of clothing, the textile and apparel industry generates as much as 3.3 billion tonnes annually in CO_2 emissions (HoC, 2019). Put in context, this value exceeds the combined emissions of all international flights and maritime shipping annually. The textile and apparel industry's environmental impact extends to significant water use, chemical and microplastics pollution, energy use and land use, as further explained below.

Water: The global apparel industry consumes around 215 trillion litres of water per year (UNEP, 2020). The greatest quantity is used during the growth or production of fibres, bleaching, dyeing and finishing in textiles production. In particular, cotton production requires large quantities of water: producing one kilogram of cotton – the equivalent of a T-shirt and a pair of jeans – requires 10,000 to 20,000 litres of water.

Land: Land use is linked to concerns over deforestation and biodiversity loss. Moreover, the eradication of carbon sinks (such as forests and wetlands) carries negative consequences for the ability to meet climate change mitigation goals under the Paris Agreement. Land is required for fibre production, particularly for cotton cultivation, which uses around 2.5% of global arable land (UNEP, 2020). Furthermore, the cultivation of cotton in arid regions increases the probability of soil degradation and erosion (UNEP, 2020).

Chemicals: Textile production is a chemically intensive process, characterised by the use and release of hazardous chemicals that can be damaging for human health and the environment. From production to the finishing stage, toxic chemicals are used and released (UNEP, 2020). Current estimates suggest the production of one kilogram of textiles requires 0.58 kg of assorted chemicals (UNEP, 2020: 27). Moreover, it has been estimated that nearly 8,000 chemicals are used in textile manufacturing processes. These chemicals often end up being discharged into soil and waterways, generating significant pollution. While much of this pollution is linked to wet-processing, such as dyeing, fibre production is also a major contributor to chemical pollution, given that cotton farming relies on the intensive use of fertilisers and pesticides.

Energy: Textile production is highly energy-intensive, emitting over 3.3 billion metric tonnes of greenhouse gases across the value chain (UNEP, 2020). Textile production accounts for a majority of the energy consumption. In particular, the wet-processing stage of dyeing and finishing require large amounts of energy, given that it involves heating large amounts of water. The high climate impact of textile production is caused by the greenhouse gases that are emitted when burning fossil fuels to generate heat and electricity (UNEP, 2020). Moreover, energy is consumed in the "use" phase, during the washing and drying of the product.

Microplastics/microfibres: Textiles are estimated to be the largest source of plastic microfibres[2] in the oceans (HoC, 2019). Microfibres – small strands of staple fibres or filaments – have been found in shorelines, sea surface and deep-sea ice. They harm marine life and enter the food chain. It is also estimated that as much as 20 to 35% of

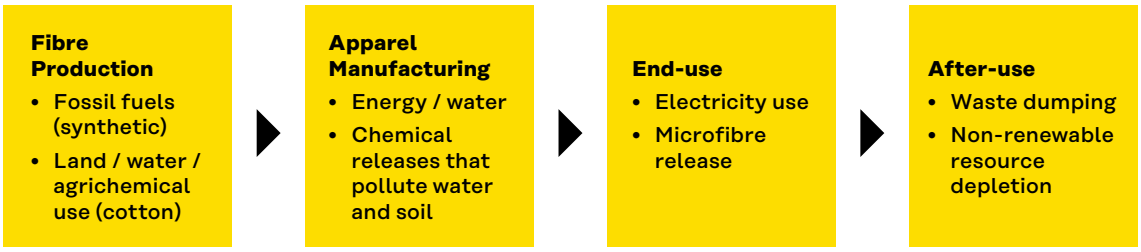
2 Microfibres of synthetic origin are a sub-class of microplastics, i.e., plastic particles with a diameter of less than 5 mm (UNEP, 2020).

all primary source microplastics in the marine environment come from synthetic clothing (Laitala et al., 2018).

As illustrated in Figure 2 below, different phases of the textiles and apparel value chain – from fibre production and clothing production to end-use and after-use – are associated with different environmental implications. For example, while the production of synthetic fibre requires a high usage of fossil fuels, natural fibres like cotton are linked to high usage of agrichemicals, land and water. Clothing production is highly energy-intensive, uses large amounts of water inputs and releases chemicals, which end up polluting waterways and soil, including by releasing microfibres. The use phase involves high levels of electricity usage (for example, when clothes are being washed), as well as high levels of water use and microfibre releases. Finally, the end-of-life phase, or after-use, is associated with low recovery rates, leading to material value loss and non-renewable resource depletion.

Figure 2. Environmental implications associated with different stages of the textile and apparel value chain

Author's illustration, based on Ellen MacArthur Foundation, 2017.



Demand for clothing is predicted to increase rapidly over the next few decades. Under a "business as usual" scenario, total clothing production is expected to reach 160 million tonnes in 2050 – almost triple the amount of what it is today. This, in turn, would significantly increase the environmental strains generated by the industry: it is predicted to increase the amount of non-renewable inputs to 300 million tonnes per year; textiles' share of the carbon budget from 2% to 28%; and to lead to the release of a total of 22 million tonnes of microfibres into the ocean – about two thirds of them linked to garment use (Ellen MacArthur Foundation, 2017). These ever-worsening environmental effects associated with the textile and apparel industry call for an urgent transition away from the current linear model towards a more circular industry.

2.2 The "what?": opportunities and challenges for circular textiles and apparel

The circular economy concept seeks to maximise the value of materials that circulate in the economy, with the objective of decoupling resource use and environmental impact. It is based on three core principles: designing out waste and pollution; keeping products and materials in use; and regenerating natural systems (Ellen MacArthur Foundation, n.d.). Applying these principles to the textiles and apparel industry would encompass (i) phasing out substances of concern and tackling microfibre release, while focusing on promoting substitutable materials; (ii) transforming the way in which clothing is designed, sold and used to extend

its lifespan; (iii) improving recycling by transforming clothing design, collection and reprocessing; and (iv) reducing the need for raw material inputs by making effective use of resources and using renewable inputs (Ellen MacArthur Foundation, 2017).

Moving towards a circular textiles and apparel industry could potentially reduce 33% of CO_2 emissions embedded in textile products and significantly reduce air, land and soil pollution linked to textiles production (Pacini, 2021). For example, extending clothing use by nine months through using more durable and sustainable material could reduce carbon, waste and water footprints by 20 to 30% (HoC, 2019). Greater circularity generates economic opportunities, enabling the recouping of some of the $500 billion in clothing that is lost annually through underuse and insufficient recycling (HoC, 2019). In addition, greater circularity in the textiles and apparel value chain would provide opportunities to develop or expand new industries related to the reprocessing and remanufacture of textiles (Schröder and Wetterberg, 2021). According to estimates from the Pulse of the Fashion Industry report, if the fashion industry were to address environmental and societal implications, it could result in benefits worth €160 billion to the world economy (GFA and BCG, 2017 cited in Ellen MacArthur Foundation, 2017).

Already, several textile and apparel companies, including Patagonia, North Face, Esprit and Levi Strauss, have adopted various circular practices (Infinited Fiber, 2022). The Ellen MacArthur Foundation (2017) predicts that by 2030, circular businesses will grow from 3.5 to 23%, totalling US$700 billion, and that by 2025, resale will grow 11 times faster compared to traditional retail. It further predicts that by 2025, clothing rental will more than double, reflecting growth in emerging economies like India, Brazil, China and Indonesia. Another study predicts that, by 2030, the global second-hand clothing market could be twice the size of fast fashion (BSR, 2021). Similarly, various multilateral initiatives have been developed to address waste and pollution challenges in the textile supply chain, including the UN Alliance for Sustainable Fashion.

An industry-wide circular transition will require a more systemic shift, where adopting circular practices becomes the norm, not the exception. Moreover, it will require circular initiatives that go beyond focusing on "closing the loop" through product take-back and the use of recycled materials. Indeed, circular initiatives that focus on the design phase, which determines 80% of a product's environmental impact, are still limited. Another limitation concerns the lack of adequate, commercially available recycling techniques. Mechanical recycling, the most common form of apparel recycling, damages the original fibres and shortens their length. This limits the options and range of markets for recycled fibres (Köhler et al., 2021). While several companies have developed, or are currently developing, recycling technologies that produce high-quality recycled fibres (see Box 1), making such techniques commercially available will be critical to advancing a circular transition in the textiles and apparel industry.

Box 1. Examples of companies developing innovative fibre technologies

Infinited Fiber: Infinited Fiber is a Finnish company that, together with the VTT Technical Resource Centre, has developed a technology that makes recycled fibre from cotton-rich textile waste and other biomaterials such as wood. The technology can remove polyester residues from cotton without downgrading the quality of the fibre. This means that the fibre has the same quality as a typical viscose fibre, thereby making it a realistic circular economy alternative to virgin fibres. Compared to viscose manufacturing, the process is more environmentally friendly, requiring fewer water inputs and emitting fewer GHG emissions.

Infinited Fiber has concluded multi-year agreements with large international fashion and apparel companies, including Patagonia, Pangaia, H&M Group and Inditex, as they look to use materials that enable the industry to shift towards circular business models. In response to this demand, Infinited Fibre plans to build a commercial-scale factory in Finland, using a €400 million planned investment.

Spinnova: Spinnova is a Finnish textile company that has innovated a natural fibre material from wood pulp that bears the same stretch and strength qualities of cotton as well as the insulation of wool. The Spinnova natural fibre can be upcycled several times without diminishing quality through a process which does not use harmful chemicals. The pulp fibre is processed mechanically and while it currently primarily uses wood pulp as an input, this can be substituted with other forms of cellulose.

TENCEL: Tencel-branded fibres are made by an Austrian company through environmentally friendly processes from sustainably sourced natural raw material wood. Tencel fibres are of botanic origin, primarily wood logs, wood chips and pulp from sustainably managed forests, which then create fashion and home products that are biodegradable. The production process involves turning wood pulp into cellulose fibres with high resource efficiency and minimal environmental impacts.

Petit Pli: Petit Pli is a UK-based company that focuses on durability and sustainability of clothing by using material technology. It is produced with recycled bottles and 100% recycled polyester fabric. Petit Pli's designs significantly reduce waste and CO_2 emissions at the point of production, distribution and after purchase and their garments grow up to seven sizes – essentially, for each Petit Pli garment, they replace seven traditional ones. The Petit Pli garments are made from recycled fabrics and have a mono-fibre construction, allowing them to be recycled easier at their end of life.

Carbon Fibres from Wood – German Institutes of Textile and Fiber Research Denkendorf (Germany): The HighPerCellCarbon® technology is a sustainable and alternative process for the production of carbon fibres made from wood. This process involves wet spinning of cellulose fibres using ionic liquids (IL) as a direct solvent in an environmentally friendly, closed-loop spinning process. There are no exhaust fumes or toxic by-products formed through this process and it allows for complete recycling of solvent and precursor fibres, thus generating minimal environmental harm.

Source: Infinited Fiber, 2022; European Circular Economy Stakeholder Platform, n.d. (a); Helsinki Times, 2021.

2.3 The "how?": identifying specific entry points for circular textiles and apparel

The transition from a linear to a circular textile and apparel production model involves (i) slowing the resource loop by reducing the amount of clothing sold; (ii) narrowing and regenerating resource loops by efficiently using safe and renewable inputs; and (iii) closing the loop by keeping apparel products in the cycle, including through upcycling. Each of these concepts, and how they apply to the textile and apparel value chain, is further explained below and illustrated in Figure 3 below.

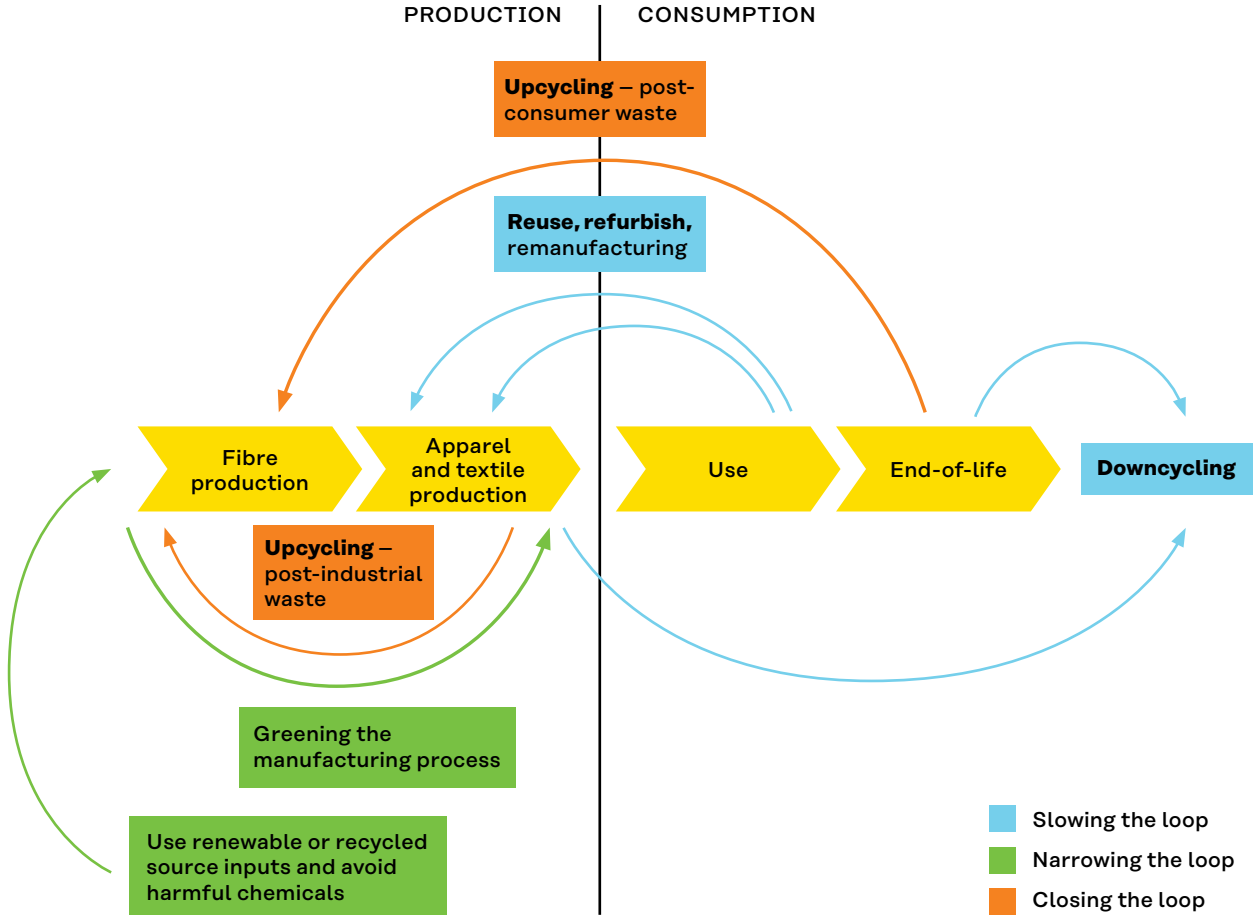
Slowing resource loops: This is critical to reducing the environmental footprint of textiles and apparel. It encompasses a shift in consumer behaviour, moving away from the fast fashion model towards a model where clothes of higher quality and greater durability are produced. This includes developing new business models that prioritise access to clothing over clothing ownership; prolonging the use phase of the product; and encouraging repair, remanufacturing and reuse of clothing items (Bocken et al., 2021).

Narrowing and regenerating resource loops: This involves reducing the environmental footprint by utilising renewable resources in the production process. This can be done, for example, by moving away from using mixed fibres (such as polycotton) towards using mono-fibres (pure cotton, for instance) in garments, or cotton/polyester substitutes such as wood or banana-based fibres (Bocken et al., 2021). Another way to narrow the resource loops is to avoid using harmful chemicals in the production process[3] while increasing the use of recycled fibres. Doing so requires applying innovative production techniques at production facilities, including the use of off-cuts directly at the production facility, or by closing chemical cycles. Resource loops could further be narrowed by greening the production process, including by reducing water inputs and electricity use in textile production.

Closing the resource loops: This refers to adopting end-of-use measures such as recycling, upcycling and reuse through which the material quality of textiles can be maintained. As noted in Figure 3 below, both post-production and post-consumer waste provide recycling opportunities in the textile and apparel value chain. To close the resource loop would require large-scale adoption of innovative recycling and sorting techniques to separate fibres without reducing their inherent material quality. There are different types of recycling. Most recycling techniques focus on open-loop recycling also known as downcycling, that is, recycling clothing into low-value applications, such as insulation material, wiping cloths or mattress stuffing. Closed loop textile-to-textile recycling technologies refers to recycling clothing into the same or similar quality applications. As is further explained in Box 1 below, technologies that recycle textiles into new, higher-value products are still under development and have yet to reach a commercial stage.

3 For example, bio, endocrine-disrupting and carcinogenic substances.

Figure 3. Narrowing, slowing, and closing the loop in the textiles and apparel value chain
Author's illustration.



As illustrated in Figure 3 above, the different ways to make the textiles and apparel value chain more circular – slowing, narrowing and closing the loop – have a different relationship to production and consumption. Narrowing the loop through using safe and renewable inputs is predominantly linked to production – both fibre and clothing production – while slowing the loop is predominantly linked to use and end-of-life and will require consumers to act. Closing the loop through recycling has implications both for post-consumer and post-production waste. The fact that some circular economy opportunities are mostly associated with production whereas others address consumption will have implications for trade, given that most of the textile and apparel products consumed in Europe have been produced in non-EU countries (European Commission, 2022a). The relationship between circular economy opportunities in the textiles sector and the fragmentation of production and trade between the EU and developing countries is further explored in section 4 below.

3 Overview of EU initiatives and proposed regulation relevant to transitioning to a circular textiles and apparel industry

To get a better sense of the implications of EU circular economy initiatives relevant to textiles and apparel trade with developing countries, it is first imperative to provide an overview of the relevant EU regulatory initiatives. These include the Circular Economy Action Plan (CEAP), which sets out the EU high-level strategy to a circular transition; the EU Strategy for Sustainable and Circular Textiles (SSCT); the Ecodesign for Sustainable Products Regulation (ESPR); and regulations relevant to the shipment of waste. This section provides an overview of each of these initiatives and highlights, where relevant, whether and how they refer to "third parties" or developing country trading partners.

3.1 The Circular Economy Action Plan (CEAP)

Acknowledging the importance of a circular economy transition, the EU adopted the Circular Economy Action Plan (CEAP) in 2020, a principal building block of the European Green Deal. The CEAP focuses on key value chains: electronics and information and communications technology (ICT), batteries and vehicles; packaging; plastics; textiles; construction and buildings; and food, water and nutrients. For textiles, the CEAP notes that it will develop a comprehensive EU Strategy for Textiles. It further highlights that key measures to be covered by such a strategy should focus on (i) applying the new sustainable product framework to textiles, including developing ecodesign measures to ensure that textile products are fit for circularity; (ii) improving the business and regulatory environment for sustainable and circular textiles in the EU; (iii) providing guidance to achieve high levels of separate collection of textile waste; and (vi) boosting the sorting, reuse and recycling of textiles, including through innovation, encouraging industrial applications and regulatory measures such as extended producer responsibility (European Commission, 2020a).

3.2 The EU Strategy for Sustainable and Circular Textiles (SSCT)

In accordance with the CEAP, in March 2022 the commission tabled a proposal for an EU Strategy for Sustainable and Circular Textiles (SSCT), an ambitious plan to ensure that, by 2030, textile products placed on the EU market are durable and recyclable, are made as much as possible of recycled fibres, are free of hazardous substances and are produced with respect for social rights and the environment (European Commission, 2022a).

The strategy contains a mix of legislative and voluntary measures together with initiatives to create an enabling environment for circular businesses. Mandatory ecodesign requirements, elaborated upon in the ESPR, comprise a key aspect of the SSCT. Other

initiatives focus on establishing transparency obligations to disincentivise companies from destroying unsold or returned textiles; harmonising EU extended producer responsibility (EPR); empowering consumers and tackling greenwashing; introducing clearer information on textiles through digital passports; addressing the unintentional release of microplastics in the environment; addressing the challenges of waste export; and publishing a transition pathway by the end of 2022 (European Commission, 2022a).

The SSCT focuses predominantly on EU textiles businesses and how they can become greener, more sustainable and more competitive. It also includes a reference to third countries, including developing countries, noting that "promoting greener and fairer value chains **across borders and continents** will ensure that textile products consumed in the EU and beyond are manufactured taking into consideration both social and environmental aspects across the globe" (European Commission, 2022a, emphasis in bold added). However, the SSCT and referenced developing country initiatives[4] do not address the implications of the EU's transition to a circular textile and apparel sector, including the ecodesign requirements. Moreover, they do not set out a clear action plan as to how textile and apparel-producing exporting countries can transition to circular production.[5]

3.3 The Ecodesign for Sustainable Products Regulation (ESPR)

As mentioned in the previous sections, ecodesign requirements form a cornerstone of the EU's circular textiles strategy. On 30 March 2022, the commission submitted a draft regulation for the Ecodesign for Sustainable Products Regulation (ESPR). The ESPR is part of the Sustainable Products Initiative (SPI) – a package that also includes a communication on products sustainability, sustainable textiles, consumer empowerment and a proposal for a revision covering construction products.

The proposed ESPR seeks to extend the scope of the existing ecodesign framework for electronic products to most products placed on the EU market, including imported products, and will thus have important implications for textile and apparel exporters in developing countries (European Commission, 2022b). The proposed ESPR sets out general design principles and requirements. It envisages the development of sector-specific approaches on the basis of these general design principles. The ESPR contains three different sets of requirements: (i) ecodesign requirements, which specify both performance requirements and information requirements; (ii) the requirement to establish a digital passport; and (iii) transparency requirements pertaining to the destruction of unsold goods. The specific requirements are further summarised in the sections below.

First, the ESPR sets out general ecodesign requirements, covering product durability and reliability; product reusability; product upgradability, reparability, the possibility of maintenance and refurbishment; the presence of substances of concern in products; product energy and resource efficiency; recycled content in products; product remanufacturing and recycling; the possibility to recover materials; products'

4 The SSCT references various European Commission communications and frameworks that focus mostly on labour and related social issues, but not on the environment. Moreover, it highlights the relevance of the commission's proposal for a Corporate Sustainability Due Diligence Directive, which would require big companies to address adverse impacts on human rights, labour and the environment, for addressing social and environmental issues in textiles value chains.

5 See, for example, the EU Communication on decent work worldwide for a global just transition and a sustainable recovery; or the Better Work Programme; or Corporate Sustainability Directive.

carbon and environmental footprints; and products' expected generation of waste materials (European Commission, 2022b, Article 5). When developing specific ecodesign requirements, as is envisaged for textile and apparel products, the ESPR notes that they must be based on product parameters (such as durability, ease of repair and ease and quality of recycling) and shall, as appropriate, include (a) minimum or maximum levels in relation to a specific product parameter; (b) non-quantitative requirements that aim to improve performance in relation to one or more parameter; and (c) requirements related to the functional performance of a product. Table 1 below provides more information about the product parameters both for performance and ecodesign requirements, as set out in Annex 1 to the ESPR.

Table 1. Product parameters under the ESPR

Source: European Commission, 2022b.

Product parameter as set out in the ESPR	Elaborated in Annex 1
Durability and reliability	Product's guaranteed lifetime, technical lifetime, mean time between failures, indication of real-use information on the product, resistance to stresses or ageing mechanisms
Ease of repair and maintenance	Product characteristics, availability and delivery time of spare parts, modularity, compatibility with commonly available spare parts; use of standard components; ease of non-destructive disassembly and reassembly
Ease of upgrading, reuse, remanufacturing and refurbishment	Number of materials and components used; use of standard components; ease of non-destructive disassembly and reassembly; conditions for access to product data; conditions for access to or use of technologies protected by Intellectual Property (IP) rights
Ease and quality of recycling	Use of easily recyclable materials, safe and easy non-destructive access to recyclable components and materials and non-hazardous substances; material composition and homogeneity; possibility for high-purity sorting; use of component and material coding standards; number of complexity of processes and tools needed; ease of disassembly and reassembly
Presence of substances of concern	Avoidance of technical solutions detrimental to reuse, upgrading, repair, maintenance, refurbishment, remanufacturing and recycling of products and components
Energy use or energy efficiency	Use of substances, on their own, as constituents of substances or in mixtures, during the production process of products, or leading to their presence in products, including once these products become waste
Resource use or resource efficiency	Consumption of energy, water and other resources in one or more life-cycle stages of the product, including the effect of physical factors or software and firmware updates on product efficiency and including the impact on deforestation
Recycled content	Use or content of recycled materials
Possibility of remanufacturing and recycling	Incorporation of used components
Possibility of recovery of materials	Quantity, characteristics and availability of consumables needed for proper use and maintenance
Environmental impacts including carbon and environmental footprint	The environmental footprint of the product, expressed as a quantification, in accordance with the applicable delegated act of a product's life-cycle environmental impacts, whether in relation to one or more environmental impact categories or an aggregated set of impact categories; the carbon footprint of the product; microplastic release; emissions to air, water or soil released in one or more life-cycle stages of the product
Expected generation of waste materials	Amounts of waste generated, including plastic waste and packaging waste and their ease of reuse, and amounts of hazardous waste generated

Second, the ESPR envisions that every product placed on the EU market will be equipped with a machine-readable passport, also called a digital product passport, which can be accessed by scanning a data carrier that is linked to a unique product identifier. The Digital Product Passport is meant to help consumers and businesses make informed choices when purchasing products, as well as to help authorities better perform checks and controls. Moreover, it aims to facilitate product repair and recycling, while tracking substances of concern along the supply chain. The information requirements for textile and apparel products will be specified in the delegated act for textile and apparel. In addition, the relevant delegated acts will provide information about the types of data to be used, layout, model, batch or item level of the passport, the way the passport shall be made accessible to customers, the parties that shall have access to information in the passport and those that may introduce or update the information in the product passport (European Commission, 2022b, Article 8).

Third, the ESPR introduces transparency requirements for the destruction of unsold goods. These requirements would apply to all stages of the value chain – from manufacturers to online marketplaces. This would include the requirement to be upfront about the quantity of products disposed of and the reasons for disposal. The objective is to reduce waste generation, disincentivise overproduction and harmonise rules in this area.

In addition, the ESPR notes, with respect to conformity-assessment procedures, that industries should use tests, measurements and other calculation methods that are reliable and reproducible (European Commission, 2022b, Article 32). It specifies that carrying out conformity-assessment procedures is the obligation of the manufacturer,[6] given that it has detailed knowledge of the design and production process and is therefore best situated to engage in the conformity-assessment procedure. It further highlights that products that have been awarded the EU Ecolabel[7] shall be presumed to comply with the ecodesign requirements – to the extent these requirements are also covered by the EU Ecolabel.

3.4 Export of textile waste

Another component of the EU's regulatory initiatives to enhance circularity is the commission's proposal to revise the existing Waste Shipment Regulation (WSR), to facilitate shipment of waste for reuse and recycling in the EU; to ensure that the EU does not export its waste to third countries; and to tackle illegal waste shipments (European Commission, 2021c). Under the proposed revisions to the WSR, waste would only be allowed to be exported to non-OECD countries if the importing country allows the specific type of waste to be imported and if the importing country can demonstrate its ability to manage the waste sustainably (European Commission, 2021c). The commission is also considering developing specific EU-level criteria to make a distinction between waste and certain second-hand textile products.

The subsequent sections will build on these regulatory proposals and analyse their implications with respect to transitioning to a circular textile economy in developing countries.

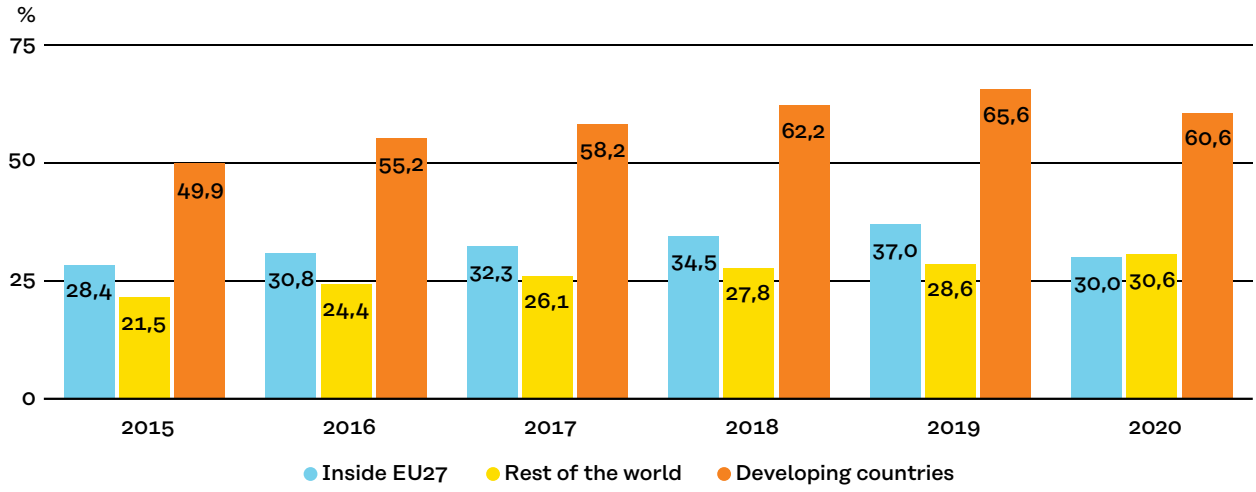
6 The ESPR defines a manufacturer as "any natural or legal person who manufactures a product or who has such a product designed or manufactured and markets that product under its name or trademark or, in the absence of such person or an importer, any natural or legal person who places on the market or puts into service a product" (European Commission, 2022b).

7 The EU Ecolabel is a voluntary label that was introduced by EU regulation in 1992. It is awarded to products and services that have a lower environmental impact compared to similar products. For textiles, specific requirements have been developed that must be met in order to be awarded the EU Ecolabel.

4 The EU circular textiles transition and implications for developing countries

The EU is the largest importer of clothing worldwide. In 2019, EU member states imported clothing worth €154 billion, just over half of which came from non-EU member states (Eurostat, 2020). As set out in Figure 4, in 2020, 44.9% of all clothing imports to the EU, measured in terms of value, came from developing countries, including China (CBI, 2021). The largest EU clothing imports from non-EU countries were China (€23 billion), Bangladesh (€15 billion) and Turkey (€9 billion), followed by the UK, India, Cambodia and Vietnam (CBI, 2021). Emerging suppliers with high growth rates include Myanmar and Ethiopia. Other countries that could become of interest to global textiles buyers include Haiti, Madagascar, Kenya, Mauritius and Lesotho (European Commission, 2017).

Figure 4. European Union apparel imports by origin
Source: CBI, 2021.



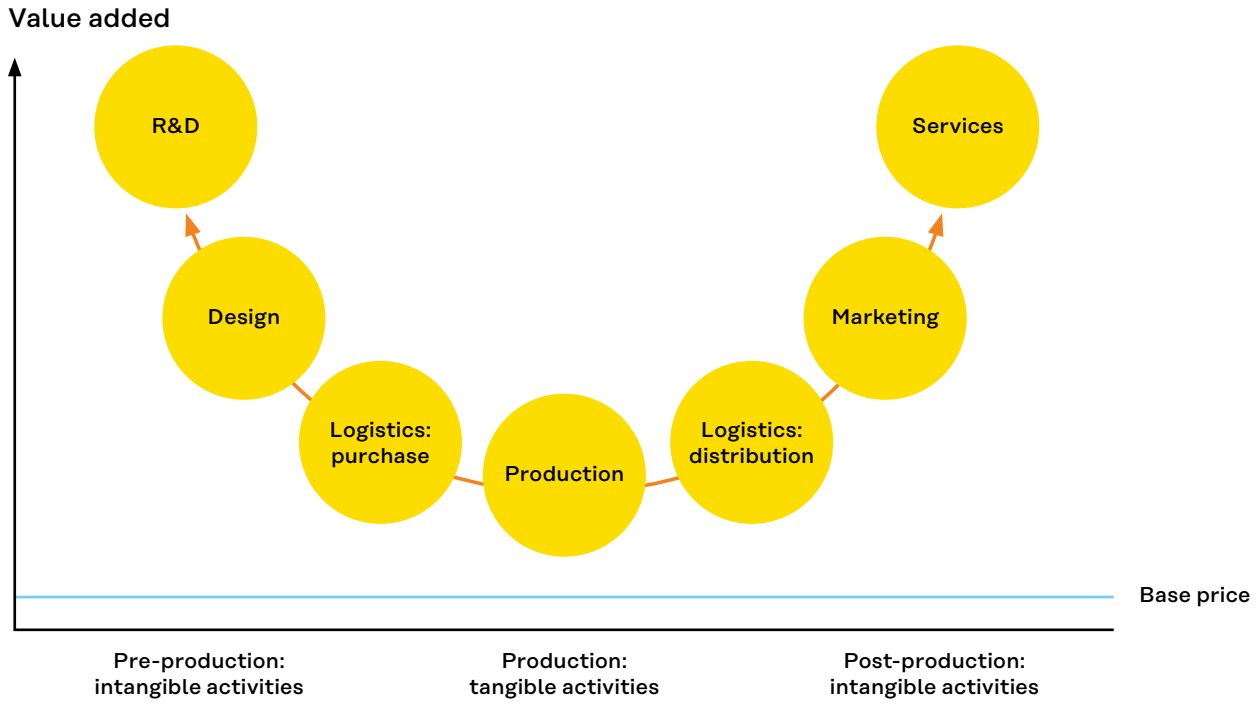
Given that more than half of all EU textile consumption is imported, and that the ESPR will be applicable to most products that are placed on the EU market, developing countries will play a critical role in the EU's transition to a more sustainable and circular textiles industry.

The position of developing countries in the textiles and apparel value chain sheds light on their role in advancing the EU circular economy transition in this sector. The textile and apparel value chain is a buyer-driven value chain, in which lead firms in developed countries or emerging markets set the terms by which developing countries can participate (van der Ven, 2015). While lead firms tend to control value-added activities, such as design and branding, manufacturing is mostly carried out in developing countries (van der Ven, 2015). As illustrated in Figure 5 below, manufacturing is the most labour-intensive phase, and the lowest in value added, involving mainly sewing, cutting and finishing

activities known as "cut-make-trim" (CMT). In general, developing country textile manufacturers are net exporters of textile products and/or intermediates while developed countries are net importers (UNEP, 2020: 17). Another notable trend is that developed countries mostly export discarded textiles to developing countries, either as second-hand clothes or as waste for recycling (Mondal, 2022). This might be changing, however, as a result of the proposed amendments to the WSR.

Significant variety exists in the positions of developing countries in the textile and apparel value chain, with some specialising in supplying key raw materials and others in exporting ready-made garments (Kabir et al., 2019).

Figure 5. Curve of value-added stages in the apparel global value chain
Source: Gereffi and Frederick, 2010, cited in van der Ven, 2015: 62.



Given the high volumes of imported textiles and apparel into the EU, many of the environmental impacts related to EU textile consumption occur outside the EU, with 85% of primary raw materials, 92% of water use, 93% of land use and 76% greenhouse gas emissions related to textile and apparel production occurring outside the EU (European Environment Agency, 2019). Thus, developing countries play a key role in reducing the environmental costs associated with textiles and clothing production and could benefit significantly from doing so.

At the same time, given that many developing countries rely on the EU as a key import market for textile and apparel products, the ESPR and other proposed regulations will have important economic implications for them. Indeed, once in force, the ESPR applied to textiles will essentially condition market access on the ability to meet the ecodesign requirements. This will incentivise circular production in textile-producing countries supplying the EU market and provide new economic opportunities in sectors like recycling and remanu-

facturing, while diversifying the country's supply of inputs. This, in turn, would also have important environmental benefits in the developing country as it would make textile production greener, including by reducing water inputs, greenhouse gas emissions and textile waste. In other words, the EU's regulatory requirements could serve as an incentive to improve circularity in textile and apparel-producing trading partners. To facilitate compliance with the new requirements, significant skills training and investment are going to be required (Ashraf and van Seters, 2022).

EU policies that seek to incentivise circular textiles will also negatively impact textiles and apparel trade with the EU (Kabir et al., 2019: 16). For instance, they could reduce demand for imported textile and apparel products. Moreover, more stringent product standards could act as a non-tariff barrier for textile production countries (Kabir et al., 2019: 17). As demonstrated by disrupted supply chains during Covid-19, reduced market access could have severe consequences for the viability of the textile and apparel industry in developing countries, which employs 75 million people globally (Köhler et al., 2021). Indeed, the sector is considered an industrial backbone for certain countries as it generates foreign exchange through trade and generates a significant number of jobs, especially for women (Haseeb et al., 2020).

From the EU's perspective, failure to consider developing countries when adopting circular economy initiatives could lead to policy incoherence, given that textiles constitute half of EU imports from countries that benefit from the Generalised System of Preferences (GSP), the EU's unilateral trade preference programmes under which developing countries benefit from tariff-free or reduced-tariffs on all or certain products when accessing the EU market (IEEP, 2020: 2). Enhancing policy alignment would require officials working on the ESPR to co-ordinate with the Directorate-General for Trade and the Directorate-General for Environment, as opposed to developing different policies in siloes. Moreover, it will require providing technical and financial assistance to GSP recipients, to help them bring their own standards and practices in line with the ESPR. Section 6.2 below explores in greater detail how to enhance alignment between the GSP and the ESPR.

The specific challenges and opportunities associated with the circular economy transition in the textiles sector will be unique for each developing country, as it will depend on the specific characteristics of the textile and apparel industry (cotton vs synthetic, for example); on the stage of the textiles and apparel value chain the country is active in (product design or CMT); on the country's general state of development; on resource endowments; and on political institutions. Policy interventions and trade agreements must be tailored to a country's specific profile. To better understand the impact of the EU's sustainable and circular textile initiatives on developing countries, the next section focuses on three EU textile trading partners: Bangladesh, Vietnam and Sri Lanka. Once a more detailed profile about these countries has been sketched, the subsequent section analyses how trade agreements can be used as a lever to advance circular economy outcomes in the textiles and apparel industry in the countries studied.

5 Case studies

5.1 Methodological approach

This section further examines circularity opportunities and challenges for three countries, Bangladesh, Sri Lanka and Vietnam. These are all developing countries that are highly dependent on the export of textile and garment products to the EU. Moreover, these three countries exhibit differences – both with respect to their textile and apparel industries and their trade arrangements with the EU – thus enabling an assessment of the implications of these differences with respect to opportunities and challenges relevant to circularising the textile and apparel industry. For instance, while Bangladesh is a Least-Developed Country (LDC) and thus a beneficiary of the Everything but Arms (EBA) programme, Sri Lanka trades with the EU under the GSP+ scheme and Vietnam has entered a Free Trade Agreement with the EU. Each of these trading schemes will offer different possibilities to enhance circularity in the textiles and apparel sector in developing countries.

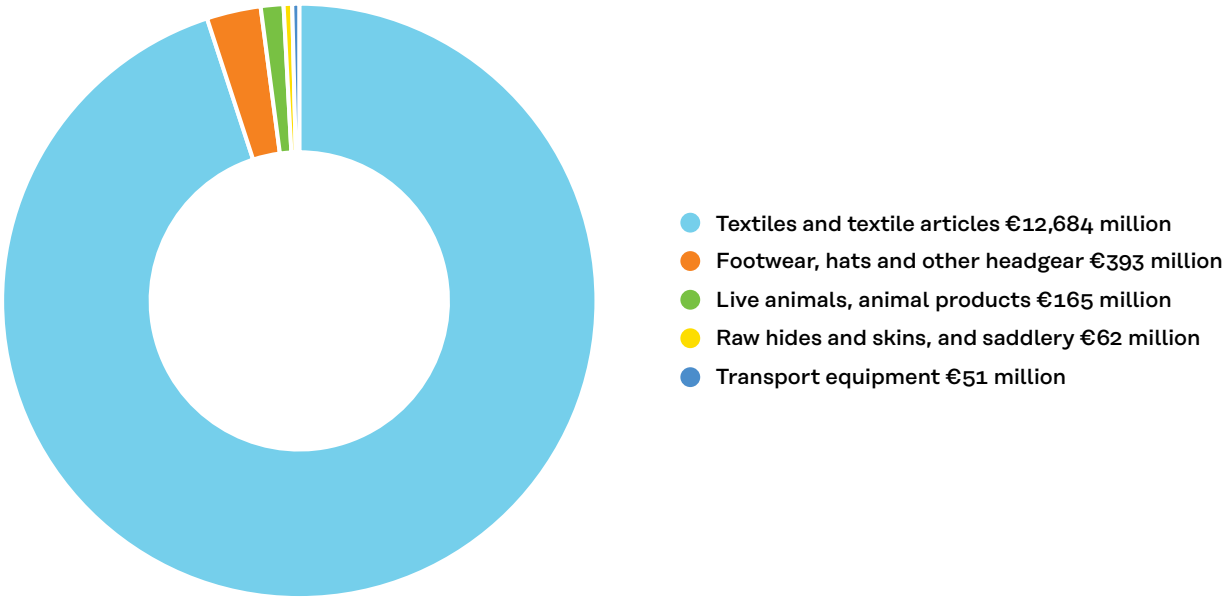
Specifically, for each of the three countries, this study (i) provides an overview of the characteristics of the textiles and apparel production, and the country's key trading partners; (ii) sheds light on the opportunities and challenges presented by making the textiles and apparel industry more circular; and (iii) highlights existing circular textiles initiatives and regulatory frameworks. The following section will analyse how identified circular textiles initiatives in the three case studies relate to the ESPR.

5.2 Bangladesh

5.2.1 Opportunities and challenges for circular textiles and apparel production

Bangladesh is a major player in the global apparel industry and a key manufacturing hub for garments and textiles. It is the second-largest exporter of ready-made garments (RMG) globally, after China, with the apparel industry accounting for over 83% of Bangladesh's total exports (Akter et al., 2022). The European Union is the single largest destination for textile exports from Bangladesh, with more than 50% of its export revenue from textiles coming from 27 EU countries (this increases to 60% when including the UK) (Razzaque, 2021).As an LDC, Bangladesh benefits from duty-free and quota-free market access under the Everything but Arms (EBA) scheme. As illustrated in Figure 6 below, most of these exports comprise apparel and other textile articles.

Figure 6. Bangladesh and the EU: imports from Bangladesh by product section
Source: GSP Hub, 2022.



Bangladesh's apparel industry is dominated by cotton. Given that Bangladesh's domestic cotton production only meets up to 1% of its cotton demand, the country is heavily dependent on cotton imports, most of which come from China and India (Islam, 2017). Most textile and apparel factories in Bangladesh produce knitted garments, sourcing textiles from local knitting and dyeing mills (BGMEA, 2021).

Around 577,000 tonnes of waste are generated annually by Bangladesh's textile and apparel factories, almost half of which is 100% recyclable cotton waste, valued at around US$100 million (Oishee, 2022; Akter et al., 2022). Due to its specialisation in cotton-rich textiles and large volumes per colour, textile waste is generally of a high grade, making it highly versatile and applicable with respect to existing recycling technologies (Global Fashion Agenda, 2022) (see also Box 2). Currently, most of this waste is either exported – mostly to India – or downcycled, used in Dhaka's bedding sector or as cushioning in automobiles, public buses and rickshaws. This presents an untapped opportunity for Bangladesh to upcycle textile waste and render the textiles industry more circular (Reverse Resources, n.d.; BGMEA, 2021).

Studies show that virgin cotton imports in Bangladesh could be reduced by approximately 20%, saving US$750 million annually, if 100% cotton and cotton-elastane waste streams were recycled domestically (Syrett et al., 2021). Moreover, if 100% of cotton was recycled within Bangladesh, cotton imports could decrease by 15%, saving US$0.5 billion (Pavarini, 2021). As it stands, less than 5% of total textile waste is recycled domestically back into fibres suitable for the apparel industry (Syrett et al., 2021). The direct capture of waste streams can also help reduce factory lead times, given that they can be collected and distributed instantly. Material price is a significant factor in the costs of apparel production, which means that using cheaper, recycled materials can increase the profitability of apparel manufacturers (Akter et al., 2022). Depending on market dynamics, products produced with a higher percentage of recycled content might also be able to receive a premium price.

Box 2. Recycling techniques relevant to cotton

Mechanical recycling: This is by far the most common recycling process for cotton. This technique consists of separating waste by colour and then shredding it before it is re-spun into new spinnable fibres. This process is best suited for mono-fibre materials, due to their fibre yield. However, mechanical recycling shortens the staple fibre length, thus compromising strength and softness of the fibres. This means that fabrics that include mechanically recycled fibres generally use only 20% to 30% of recycled fibres, with the remaining percentage being virgin materials. Generally, only pre-consumer waste tends to be recycled.

Chemical recycling: Chemical recycling of cotton is still in its infancy. This technique consists of retrieving cotton from waste garments and dissolving it to a molecular level. This turns it into a dissolving pulp, which can be used to make viscose and lyocell products. The recycled cotton can then be a feedstock for viscose or lyocell process. Especially when used in the latter, it can reach a high quality.

Source: Rengel, 2017.

5.2.2 Private and public-sector initiatives

Textile and apparel companies in Bangladesh must adhere to the Environmental Conservation Act (1995), the Environmental Conservation Rules (1997) and the National 3R Strategy for Waste Management. As part of the Bangladesh Environment Conservation Act, Bangladesh adopted the Hazardous Waste Management Rules for e-waste in 2021, which requires manufacturers to meet collection targets (Huang, 2021). No similar regulation or targets exist for textile waste management. The National 3R Strategy for Waste Management, developed in 2010, identifies industrial waste as one of the priority areas. However, this document is mostly aspirational and does not set out concrete waste-management targets (Department of Environment, 2010). In addition, Bangladesh has yet to adopt an extended producer responsibility law. Thus, scope exists to enhance government regulation with respect to textile waste management, including by establishing a minimum recycled content for textiles (World Bank, 2021).

Various non-governmental initiatives have been developed by donor organisations and development partners to address textile waste and circular textile production. (Akter et al., 2022). An important initiative is the Circular Fashion Partnership (CFP), a cross-sectoral initiative formed by the Global Fashion Agenda (GFA), Reverse Resources (RR) and Partnerships for Green Growth (P4G) that seeks to reduce dependence on virgin materials by increasing the use of recycled materials and directing post-production textile waste back into new textile and apparel products (P4G). Another promising development advanced by Reverse Resources is a platform also called the "Uber of textile waste", which connects those across the waste supply chain, including large suppliers in Bangladesh and India that seek to segregate, sell and trace waste fabrics (Reverse Resources, 2020). The platform developed by Reverse Resources includes a digital warehouse where textiles waste can be registered and tracked, thereby facilitating

data collection and recycling and reuse of discarded resources (European Circular Economy Stakeholder Platform, n.d.(b)).

The private sector is also active in adopting circular and sustainable production processes. Six out of the world's top 10 green factories are based in Bangladesh, which house 152 LEED-certified factories, as well as 500 units in the process of obtaining certification from the US Green Building Council (BGMEA, 2021). The Bangladesh Garment Manufacturers and Exporters Association (BGMEA), the country's largest garment manufacturers' union, has been at the forefront of these developments. The BGMEA has also joined the Green Button, an initiative led by the German government that certifies sustainable textiles covering environmental criteria ranging from wastewater treatment to labour standards (Federal Ministry for Economic Cooperation and Development, 2022). Moreover, a number of Bangladeshi textile and apparel products have been certified under Cradle to Cradle, a standard that measures social and environmental sustainability (EIG, 2021).[8] These voluntary standards are further explained in Box 3. Moreover, BGMEA joined the UN Fashion Industry Charter (UNFCCC), with an ambition to reduce GHG emissions by 30% by 2030 (BGMEA, 2021).

Despite these and other initiatives in the circular textiles and apparel space, Bangladesh faces various challenges that must be overcome to fully develop a more circular textiles and apparel industry. One issue concerns post-industrial waste recycling. Currently, waste tends to flow through informal channels, passing through middlemen, with segregation and sorting done manually and often inefficiently. Contamination levels in recycled textiles are typically high and much of the waste does not meet the requirements of recycling technologies. Moreover, the informal nature of the waste-management network makes product traceability very challenging. Relatedly, manufacturers consider cotton waste incineration a cost-effective and reliable energy source. As a result, large volumes of severely valuable and easily recyclable textiles have been lost.

Bangladesh's current recycling capacity for apparel-quality recycled yarns is severely inadequate. It is estimated to be 18,000 to 24,000 tonnes per year – which covers only 5% to 7% of the over 330,000 tonnes of 100% cotton and cotton-elastane waste that gets generated per year (Syrett et al., 2021).

8 See, for example, Azure Denim fabrics.

Box 3. Overview of sustainable certifications

LEED Certification for Green Factories: The LEED certification is a private standard that is used to rate green buildings. To achieve the LEED certification, a factory's green initiatives are reviewed. Factors that are looked at include sustainable site development; water efficiency; material selection; how the factory reduces pollution and improves local environmental quality; how it reduces greenhouse gas emissions; the approach to recycling and reducing the use of virgin material; and more generally the approach to waste management.

The Green Button: This is a German state-run certification mark for textile products manufactured sustainability and in accordance with social and environmental standards. It aims to guide consumers when making purchasing decisions. To obtain the Green Button certification, companies must meet high standards that correspond to different principles, ranging from identifying and prioritising risks to transparent reporting. Moreover, unlike the LEED certification for Green Factories, the Green Button certification also requires that products comply with 26 minimum social and environmental standards. These include a ban on chemicals; biodegradability; a pollution threshold for wastewater; less air pollution through CO_2; natural fibres tested for harmful substances; and chemical fibres tested for harmful substances.

Cradle-to-Cradle Certified: The Cradle-to-Cradle certified is part of the Cradle-to-Cradle Products Innovation Institute, which is dedicated to enhancing innovation for the circular economy through products that have a positive impact on the planet. To receive the Cradle-to-Cradle certificate, a product must be certified (i) for humans and the environment; (ii) to enable a circular economy through regenerative products and process design; (iii) to protect clean air, promote renewable energy and reduce harmful emissions; (iv) to safeguard clean water and healthy soils; (v) to contribute to social fairness.

Environmental Management System (EMS) ISO 14001: This is a standard developed by the International Organization for Standardization (ISO) which provides an organisation with a framework to develop an environmental management system (EMS). In addition, ISO 14006 focuses on management systems to implement environmentally conscious ecodesign. Moreover, ISO/TC 323 is a technical committee of the ISO which aims to establish circular economy standards.

Source: Kiron, 2021; Federal Ministry for Economic Cooperation and Development, n.d.

Tackling these issues will require large amounts of tailored investment, including in innovative technology, post-industrial waste-recycling infrastructure and digitalisation. Concerns have been raised that such investments might undermine the competitiveness of Bangladesh's textiles sector, which is mostly competitive labour, given that it will add to the price of production.

5.2.3 Main take-aways

Given that most of Bangladesh's post-industrial waste is comprised of 100% cotton and therefore easy to recycle, Bangladesh has a great opportunity to enhance post-industrial recycling. However, current post-industrial recycling rates are highly inadequate, reflecting the fact that circular economy initiatives in Bangladesh are still in their infancy and driven by the private-sector/donor organisations. To scale up these waste-management initiatives, it will be important for the government to establish an adequate legislative framework that includes industrial textile-recycling targets and to introduce extended producer responsibility (EPR). Similarly, given the current informal character of waste management, it will be important for the Bangladeshi government to find ways to formalise this sector without alienating the individuals currently active in the informal networks. Making progress in these areas will require technology upgrades and investment in post-industrial waste management, as well as improvements in data collection and waste tracking, which are currently very poor.

By and large, existing circular initiatives in the textiles and apparel industry focus on "greening" or rendering the textile and apparel production process more sustainable. They do not, however, focus on designing products to enhance durability and recyclability of the product that is being created, which is the focus of the ESPR. This might be, in part, because product design tends to be controlled by lead firms that are headquartered in developed countries. However, investing in circular design requirements could potentially present an opportunity for Bangladesh to move up the value chain while at the same time increasing sustainability. The extent to which this is feasible would have to be further researched. It would also require the Bangladesh government to provide support, for instance as part of the Technology Upgrading Fund (TUF) that provides for low interest/concessional loans (BGMEA, 2022).

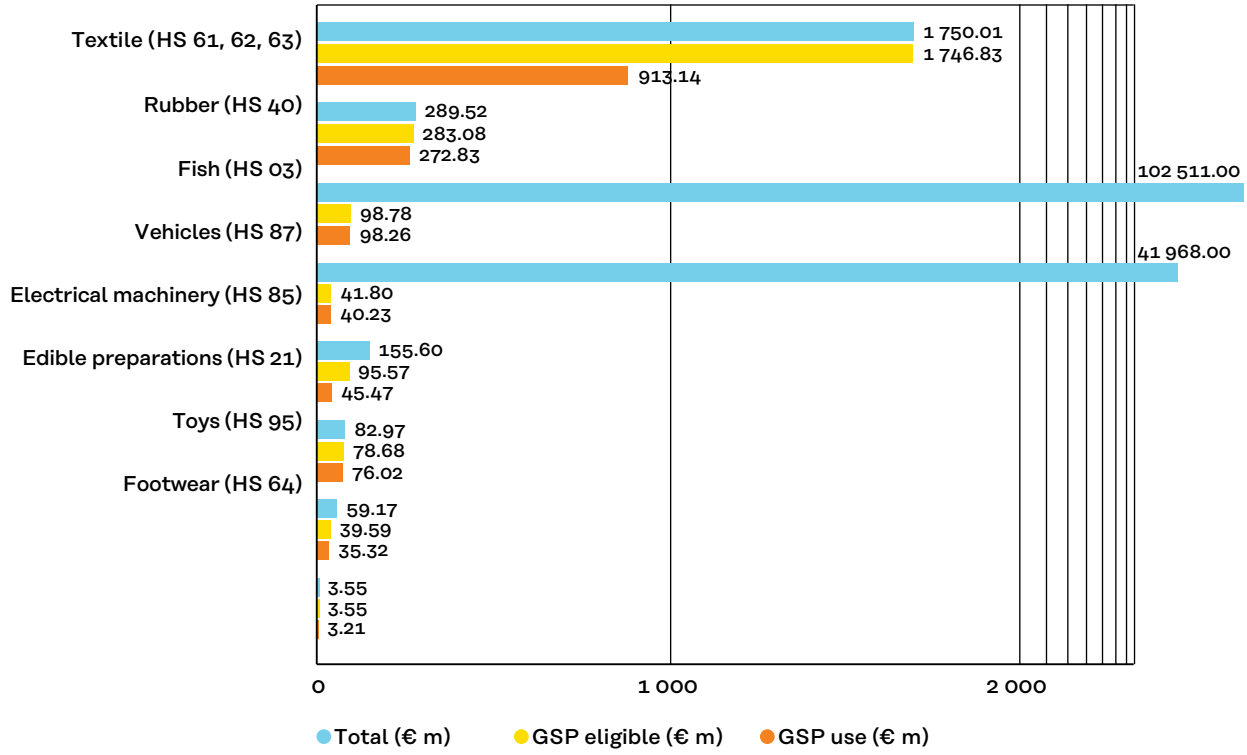
5.3 Sri Lanka

5.3.1. Opportunities and challenges for circular textiles and apparel production

Textiles and apparel constitute Sri Lanka's main export, valued at US$5.42 billion and employing around 15% of the total workforce (Sri Lanka Export Development Board, n.d.). After China, the EU is Sri Lanka's largest export destination, receiving 22.4% of the country's total exports in 2020 (Directorate-General for Trade, 2022). As a GSP+ beneficiary, Sri Lanka benefits from tariff-free imports with respect to 66% of tariff lines, including textiles and apparel products. As set out in Figure 7, more than half of Sri Lanka's exports to the EU are textiles and apparel.

Figure 7. Overview of total Sri Lankan exports to the EU – GSP eligibility and GSP use

Source: European Commission, 2020c.



Sri Lanka's textile and apparel industry is mostly comprised of processing imported fibres into fabrics (dry and wet processing) and then into garments. Over the last two decades, Sri Lanka has moved away from producing basics like knitwear and T-shirts and developed expertise in higher-value-added products for niche markets, including intricate embroidery, embellishments, swimwear, women's intimate apparel, jeans and seamless athleisure (van der Ven, 2015). This in part reflects the high labour costs in Sri Lanka, which made basic CMT operations less competitive. It is also the result of Sri Lanka's early moving advantage in the apparel industry, which has resulted in strong ties with major international brands and a proactive industrial strategy that has directed resources to technical training in higher-value-added activities, such as design and marketing (van der Ven, 2015).

In contrast to Bangladesh, which relies mostly on cotton, Sri Lanka's apparel industry stands out for using a high percentage of synthetic or man-made fibres, 50% of which it imports from China and India. Textiles made of synthetic petroleum-based fibres are difficult to recycle and generally have low levels of biodegradability. Both chemical and mechanical recycling processes require high feedstock purity and cannot process mixed materials inputs (such as garments made from various different fibres) or chemicals and finishes applied to garments (Schumacher and Forster, 2022). The use of synthetic fibres and blends is making recycling challenging. Moreover, the benefits of recycling synthetic fibres are not as clear cut compared to textiles: recycled synthetic fibres may spread microplastic more easily and its effects on health and the environment are still unclear.

The textile and apparel industry in Sri Lanka generates at least 30,000 tonnes of textile waste each year, comprising excessive textiles, rejected fabric, off-cuts and rejected

products (Park and Evans, 2017). Yet few textile-recycling facilities exist in Sri Lanka, as most of the post-industrial textile waste is exported, burned to generate energy for the cement industry or landfilled (Dissanayake and Weerasinghe, 2021; IfM, 2017). Collection and disposal of post-industrial waste, to the extent it takes place, is done through company initiatives. However, these company initiatives are largely inadequate; according to a study that surveyed textile manufacturing firms in Sri Lanka, only 22% of respondents reported that firms take the initiative in waste-recovery activities (Dissanayake and Weerasinghe, 2021: 2).

5.3.2 Private and public-sector initiatives

Various companies are active in advancing circular textile initiatives. For example, the Hirdaramani Group, one of Sri Lanka's largest exporters, has joined forces with the Ellen MacArthur Foundation's "Make Fashion Circular" initiative to improve its use of resources, encourage regenerative efforts and reduce waste production with better design options in apparel manufacturing (Hirdaramani Group, n.d.). Another example is apparel manufacturer Crystal International Group Limited, which aims to recycle 4% of waste generated by its factories in Sri Lanka through a partnership with a US technology firm (Barrie, 2019). Moreover, Sri Lanka is home to the first apparel manufacturing facility to receive platinum status under the LEED Green Building Rating System, as explained in Box 3 above (Sri Lanka Apparel, 2022).

Given that Sri Lanka's textiles activities are centred on processing imported fibres into fabrics (dry and wet processing) and their transformation into garments, opportunities for Sri Lanka to render their textiles industry more circular can be found in the design and fibre-use transition. With respect to design, Sri Lanka could adopt an industrial strategy that would direct resources into technical training and investment necessary for circular design. Sri Lanka is well placed to do so, given that it has previously developed a niche apparel industry focused on design and marketing. As a result, it will have a large workforce available with the relevant design skills that would facilitate developing the requisite expertise in ecodesign. In this regard, Sri Lanka could focus on improving product design to minimise the need for blended fabrics that are so difficult to recycle.

With respect to fibre design, one way to render the industry more sustainable is to analyse options to replace some of its synthetic fibre imports with local non-synthetic materials. The introduction of natural alternative fibres with fewer externalities could gradually offset the high environmental cost associated with synthetic fibre production. Possibilities to do so have been identified in various natural fibres present in Sri Lanka, including banana plants, kithul (fishtail palm) and bamboo. Sri Lanka's Institute of Textile and Apparel (SLITA), in collaboration with the Ministry of Industry and Commerce and Moratuwa University, is in the process of developing BananaTex, which uses eco-friendly technology to turn banana stems – often discarded as waste – into fibre and then yarn (Additaya, 2020). Major clothing companies like H&M and Arket are starting to use BananaTex.

5.3.3 Main take-aways

Circular economy initiatives in Sri Lanka still have a long way to go, with most initiatives being spearheaded by the private sector. Given the history and characteristics of Sri Lanka's textile and apparel industry, opportunities exist in circular design, as well as substitute fibres. Indeed, having developed a niche apparel industry focused on design and marketing makes Sri Lanka perfectly positioned to invest in circular design –

which is also the focus of the ESPR. In this regard, Sri Lanka could focus on improving product design to minimise the need for blended fabrics that are so difficult to recycle. Already Sri Lanka seems to be focused on developing and commercialising nature-based fibres, such as BananaTex. Time will be required for these technologies to truly take off and replace significant amounts of synthetic materials.

Integrating circularity into Sri Lanka's apparel and textiles industry will require that the government plays a more central role. As in the case of Bangladesh, establishing a legal framework with textile-recycling targets and EPR that includes waste management in the textile and apparel sector would be an important step to ensure that textile and apparel businesses embrace circularity. Related to this, however, would be adopting incentives to attract investment in advanced recycling machinery and technology that makes it possible to adequately recycle the blended polyester fabrics. Private-sector involvement also remains critical to enhancing investments in waste management and product design technologies necessary to make the transition to a more sustainable textiles industry, as well as industrial design and waste-management technologies (Dissanayake and Weerasinghe, 2021).

In contrast to Bangladesh, enhancing post-industrial waste recycling will not be a low-hanging fruit. This is in part due to the heavy use of polymers and blended fibres in Sri Lanka's textile and apparel products, which makes recycling more technically challenging and expensive. This highlights the importance of investing in commercialising innovative recycling techniques, as well as in designing textile and apparel products in a way that facilitates recycling.

5.4 Vietnam

5.4.1. Opportunities and challenges for circular textile and apparel production

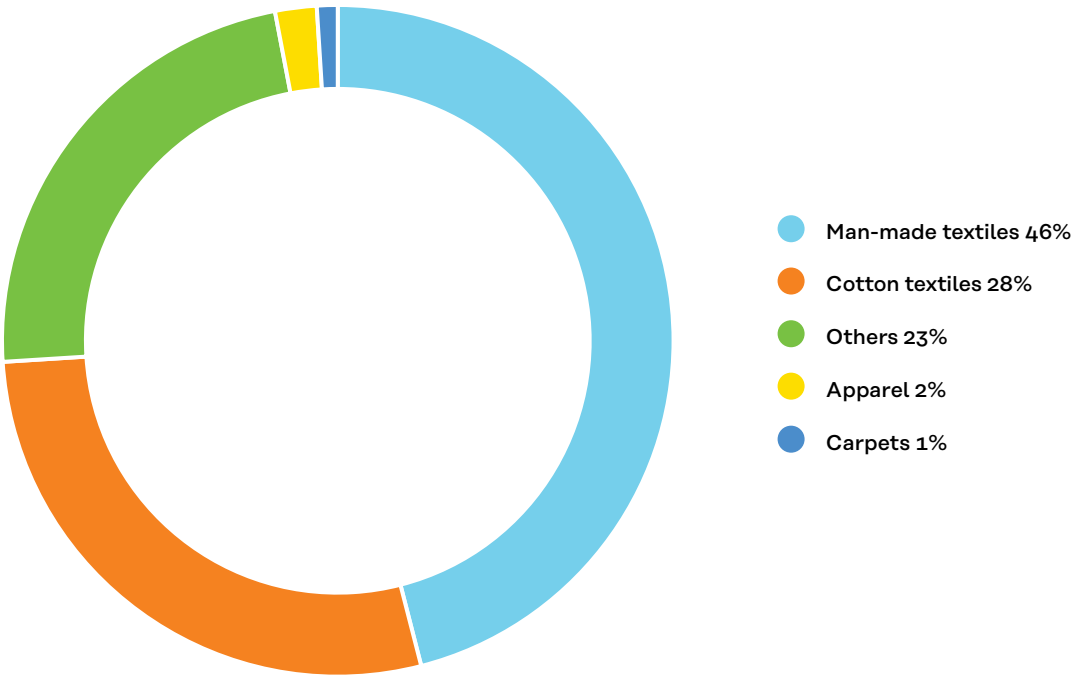
Vietnam is the fourth largest exporter of textiles and apparel globally, after China, India and Bangladesh. The textile and apparel industry is one of Vietnam's key industries and accounts for almost 15% of the country's total export turnover. Between 2005 and 2017, Vietnam's market share increased from 1.7 to 2.5% (WWF Vietnam, 2021). In 2018, it was estimated to employ more than three million people, with a total of 7,000 factories across the country (WWF Vietnam, 2018). Vietnam's main textiles and apparel export markets are the European Union, the United States, Japan, Korea and Canada.

In contrast to Sri Lanka and Bangladesh, Vietnam trades with the EU under a Free Trade Agreement, the EU-Vietnam Free Trade Agreement (EVFTA). As part of this arrangement, Vietnam can export apparel products on a tariff-free basis, subject to strict rules of origin. The implications of this arrangement to enhance Vietnam's transition to a sustainable textiles industry will be discussed in more detail in section 6.1.

Vietnam's textile and apparel industry is made up of three sub-sectors: fibre production, fabric production and dyeing, and garment manufacturing (Nguyen, 2020). The fibre production sub-sector is of low quality and therefore used mainly for domestic consumption. Most of Vietnam's textiles industry focuses on garment manufacturing, 70% of which is comprised of CMT, which

also dominates Vietnam's exports (Nguyen, 2020). With respect to raw material inputs, Vietnam uses predominantly cotton and polyester/man-made textiles (IDS, n.d.). As illustrated in Figure 8, polyester/man-made textiles dominate Vietnam's imports, comprising around 46% of all textile and apparel imports in 2019, whereas cotton textiles comprise 28% of textile and apparel imports. Top input suppliers to Vietnam include China, Korea, Taiwan, the US, Japan and Thailand (Arora, 2021).

Figure 8. Overview of textile and apparel imports by Vietnam (2019)
Source: Arora, 2021.



Compared to Sri Lanka and Bangladesh, the Vietnamese government plays a more active role in incentivising a transition to a circular textiles and apparel industry. Specifically, it has established an environmental administration and developed laws, policies and other legal and policy instruments to prevent industrial discharge and protect the environment against pollution. These include strategies relevant to energy efficiency and green productions, management of industrial parks and economic zones that include instructions and incentives to move towards green production, requirements for water exploitation, usage and management, chemicals usage and management, and waste management. Several laws and policies specifically target the textiles industry, for example by establishing regulations relevant to the content of formaldehyde in textile products. However, despite the introduction of these policy instruments, it is generally considered that they have not been effective in reducing industrial pollution in the country (Loan, 2011).

5.4.2 Private and public-sector initiatives

In January 2022, Vietnam's Law on Environmental Protection came into effect. This law sets out how ministries and localities can better integrate circular economy principles in planning strategies, development plans, waste management and waste recycling. Importantly, the law introduced an EPR regime that makes producers and importers responsible for managing waste associated with the life cycle of their products (Nguyen and Komarnisky, 2022). The EPR law contains obligations to recycle packaging, products and, for those products that are difficult to recycle, the obligation to contribute to waste management. Interestingly, garments are placed in the "waste management" category, requiring importers and producers to make a financial contribution to the Vietnam Environmental Protection (EVP) Fund that supports waste-management activities (Nguyen and Komarnisky, 2022). It does not, however, include recycling targets for textiles and apparel industries.

Vietnam's Textile and Apparel Association (VITAS) has started focusing on greening production. It has set the target of reducing energy consumption during textiles production by 15% and water consumption by 20%, with the objective of transforming the textile and apparel industry into a green industry by 2030 (Ly, 2022). Developing eco-industrial zones is a key part of the strategy to execute environmental programmes. One such model has been tested for the Nhon Trach 2 Industrial Zone, involving the presence of textile companies, a by-production company, a unified waste-treatment enterprise, onsite and offsite waste exchange networks and a centralised wastewater treatment plant. The geography allows for optimisation of scale in infrastructure, as well as the valorisation of waste and by-products both on and offsite (Loan, 2011). Creating the Nhon Trach 2 Industrial Zone model involved the reduction of wastewater flows in textile enterprises, the establishment of a waste exchange network and the establishment of a complete treatment and reuse system for wastewater (Loan, 2011).

In addition, the private sector has engaged in numerous activities to enhance the sustainability and circularity of textile and apparel companies. For example, several international brands are involved in the Race to the Top – a multi-stakeholder platform focused on enhancing sustainability, including by seeking to improve environmental performance. Other brands are part of the International Finance Corporation (IFC)'s Vietnam Improvement Programme, which seeks to foster sustainable manufacturing in the apparel, textile and footwear sectors by promoting resource efficiency (WWF Vietnam, 2021). Specifically, it is working with supplier factories to implement projects that save water, energy and chemicals. After 18 months of operation, it has achieved an aggregate of US$15 million in cost savings due to resource savings and productivity gains and has reduced greenhouse gas production by 100,000 tonnes annually (IFC, 2022).

Moreover, by the end of 2020, it could count 93 projects that had been awarded the LEED certification (56% being factories) and 34 projects that had been awarded the LOTUS certification (26% being factories), with more companies expected to be certified in the future (Korea Bizwire, 2022). Vietnam-based companies have also been exploring how to leverage innovations in information technology to reduce resources, energy and waste in the manufacturing process. It has been found that when applying information technology, 3% of materials can be reduced in the fabrication and cutting process, while 80% of labour can be saved (WWF Vietnam, 2021). For example, the Vietnamese apparel manufacturer, Duch Hanh Garment JSI, has reduced fabric waste by almost 2% and saved 2.2% of its material costs due to the introduction of artificial

intelligence that helps predict fabric requirements (Husband, 2021). Given that the textiles industry is an important source of employment, the social consequences of labour reduction must also be considered.

5.4.3 Main take-aways

Compared to Bangladesh and Sri Lanka, the government plays a greater role in pushing for a circular textiles industry in Vietnam. Not only has it adopted various environmental laws specifically applicable to greening the process of textiles production, it has also adopted an EPR law, which came into effect in January 2022. Interestingly, however, the EPR does not require importers and producers of textile and apparel to recycle their waste, but rather seeks contributions to a waste-management fund. This suggests that the actual recycling of textiles waste in Vietnam is not a priority. Similar to Sri Lanka, this is related to the fact that most of Vietnam's textile and apparel products are blended polyester with high levels of contamination, which makes recycling both challenging and expensive.

Most activities that seek to enhance sustainability in the textiles and apparel sector focus on greening the production processes, either through water management or reducing electricity use in the production process, including through creating economies of scale through eco-industrial parks. Moreover, the private sector plays an important role in developing sustainable textiles practices. Given that 70% of Vietnam's export revenue from apparel and textiles came from FDI in 2019, it is critical that the private sector plays an important role in adopting more circular strategies. Developments are also underway to adopt artificial intelligence and other technologies to enhance resource efficiency.

Vietnam's circular economy initiatives mostly focus on greening production, not on substituting polyester with environmentally friendly materials, such as recycled polyester or organic cotton, or on product design (Fibre2Fashion, 2022). These elements of the circular economy should not be overlooked, however. Indeed, Vietnam might consider adopting policy strategies to focus on circular design that could make Vietnam move up in the textile and apparel value chain. Vietnam's challenges with respect to post-industrial waste management in the textile and apparel value chain also highlight the importance of investing in designing products that would be easy to recycle, including by using fewer fibre blends.

5.5 Summary observations

Several high-level observations can be drawn from the three countries studied in this section.

Private vs public sector: Most of the circular textile initiatives in the three countries studied are spearheaded by the private sector, often supported by donor-led initiatives. In each of the three countries studied, voluntary sustainability standards play an important role. This is in part because many companies in the countries studied are foreign owned, with brands pushing for their operations to become more environmentally sustainable.

There is, however, a notable absence of government involvement in establishing textile waste-recycling incentives. In Bangladesh, post-industrial waste is managed by an informal operator; in Sri Lanka, few regulatory initiatives have been adopted to transition to circular textiles. The Vietnamese government has been more active in establishing a regulatory framework to incentivise a circular economy, requiring importers and producers to responsibly manage their waste through the adoption of EPR. However, the EPR does not establish recycling targets for textile and apparel waste, but instead focuses on waste management.

For effective post-industrial waste management, it would be important for governments to establish adequate regulatory frameworks. Failure to do so would, in a best-case scenario, lead to a bifurcation where foreign-owned companies supplying the export market would adopt circularity principles, while factories supplying the domestic or regional market would continue to engage in linear, and environmentally harmful, practices.

Cotton vs synthetic: Countries' circular economy initiatives differ depending on the industry characteristics. For example, in Bangladesh, cotton recycling presents a large untapped opportunity due to the prevalence of 100% cotton waste which is easy to recycle. By contrast, both Sri Lanka and Vietnam rely on a mixture of cotton and synthetic, as well as blended materials. These blends require significant efforts in sorting and separating and typically contain many chemicals or accessories. This makes it much more difficult to recycle. In these countries, circular efforts should focus on improved product design that would facilitate recyclability, as well as in adopting incentives to attract investments in adequate recycling machinery and technology.

Process vs product: Another interesting observation is that circular economy initiatives adopted in the countries studied focus on enhancing circularity in the *production process* itself, either through waste management or reducing resource inputs in the production process. These initiatives seek to reduce the environmental footprint of the product. They do not, however, focus on making the *product* itself more circular, through enhancing reusability and recyclability in the way the product is designed. This is important for three key reasons: (i) most of the added value will take place in upstream design activities – not waste-management activities; (ii) 80% of the environmental impacts of a product are determined at the design phase; and (iii) because the ESPR focuses on the circular characteristics of the product itself, not the production process.

5.6 Linking case study observations to the ESPR

Having identified the state of play of the textiles and apparel circularity initiatives of Bangladesh, Sri Lanka and Vietnam's textile industries, this section focuses on how these initiatives relate to the proposed ecodesign requirements under the ESPR, as explained in section 3.3. This highlights further challenges.

As noted in the previous section, the circular economy initiatives in the countries studied focus on enhancing circularity in the production process, whereas most of the product parameters set out in the ESPR focus on the performance of a product; that is, the product's recyclability, durability, reusability, etc. Increasing post-industrial waste recycling and/or greening the production process by reducing water input does not automatically translate into producing a more circular product. Indeed, even if Vietnam or Sri Lanka were to enhance post-industrial waste management, this would not make it easier for the product to be disassembled or recycled. For countries with relatively homogenous waste, such as Bangladesh, this might constitute less of a challenge compared to countries that primarily use blended fibres and synthetics, like Vietnam and Sri Lanka.

Other proposed ESPR requirements seem to be more aligned with the focus of ongoing circular economy initiatives in the countries studied. For example, the ESPR provides for a minimum content of recycled fibre in products. Bangladesh's focus on upcycling post-consumer cotton waste and reusing this together with virgin cotton in the production of new products would improve the firms' ability to meet the minimum required recycled content standard –

depending on the threshold for recycled content imposed. Similarly, the focus on greening the textile production process, by reducing water input and ensuring wastewater is recycled, could contribute to reducing the product's environmental footprint – another intended product parameter.

Companies that comply with relevant VSS will generally be better positioned to meet the ESPR's requirements, as is further explored in Annex 1. This would especially be the case for standards that seek to green the production process, and especially VSS that focus on product performance. As will be further explored below, this means that VSS will play an important role in addressing challenges for developing countries to meet anticipated ESPRs for garments and textiles.

The ESPR also obliges manufacturers to carry out a conformity-assessment procedure to demonstrate compliance with the ESPR. This will constitute an additional burden on manufacturers and could increase costs. Products that have been awarded the EU Ecolabel shall be presumed to comply with the ecodesign requirements – to the extent these requirements are also covered by the EU Ecolabel.

Another important element to highlight is the digital passport requirement. To recap, the ESPR requires that each product contains information about a product's environmental sustainability. This means identifying the content of the product – including the percentage of recyclable material that has been used, and the type of recycled waste used. For the countries studied, traceability is typically very poor, especially with respect to post-industrial waste tracking. For example, in the case of Bangladesh, an informal network of waste collectors and local vendors is responsible for post-industrial waste management, whereas in Sri Lanka this is largely in the hands of the private sector. In both instances, data is difficult to collect due to poor traceability in the informal sector and proprietary knowledge protection from private firms. Ensuring that products have digital passports will thus entail making significant investments in the tracking of materials used in the garment sectors.

For imported textile and apparel products from Vietnam, Bangladesh and Sri Lanka to comply with the ESPR will require great levels of commitment, from governments, the private sector and donor organisations. At a minimum, significant investment will be required, including in developing adequate recycling technologies and ensuring that companies have access to technological innovations that enable recycled fibres to be used as inputs in the textile production process or that seek to develop fibres from natural sources. Moreover, countries must focus on enhancing product traceability to be aligned with the digital passport requirements. Many of these processes are digitalised, highlighting the importance of developing and investing in digital technologies. Digital tracking of materials is likely to constitute a major challenge for many developing countries.

In addition, it is imperative that textile and apparel exporters in developing countries focus on circular design. As many innovations are being developed in advanced economies, these technologies will either have to be licensed or accessed through joint venture incentives/requirements. Another important requirement would be ensuring that the ESPR does not constitute a non-tariff barrier for businesses in developing countries, including by looking into the operationalisation of conformity-assessment procedures.

Based on this analysis, the following seven priority areas would enable developing countries to take advantage of opportunities presented by the ESPR while mitigating the challenges.

- Developing a strategic approach to develop a circular textiles and apparel industry/adopting appropriate regulatory framework.
- Ensuring circular initiatives are not limited to waste management but are also focused on product design and developing alternative and recycled fibres.
- Promoting and facilitating circular investments and investments of relevance to circular textiles and apparel.
- Increasing access to critical technologies necessary to advance the transition to a circular textile industry, including in recycling systems and innovations in nature-based fibres.
- Investing in skills development through capacity building.
- Reducing the risk that the ESPR becomes a non-tariff barrier, including through mutual recognition.
- Enhancing product traceability in the textile and apparel supply chain –with respect to both material tracing and overall trade transparency.

Many of these require domestic action, but, as discussed in the sections below, they also have a trade component.

6 Leveraging trade agreements to achieve a just transition to circular textiles

Having examined the challenges and opportunities for a circular textiles and apparel transition in developing countries, this section explores in more detail how trade arrangements – regional trade agreements (RTAs) and unilateral preference programmes – can be leveraged to address these challenges and advance the opportunities. Where relevant, the analysis in this section will use examples from the EVFTA and the GSP+ and EBA arrangements that regulate trade between the countries analysed as part of the case studies and the EU. However, this section seeks to go beyond demonstrating how these existing arrangements can be implemented or leveraged to also focus on (i) how developing countries can strategically negotiate future RTAs with an eye to economic challenges and priorities; and (ii) how the EU's GSP scheme and the ESPR can be better aligned. Doing so would enable developing countries to be more strategic in implementing and negotiating RTAs while ensuring regulatory coherence between the circular economy initiatives and EU trade policy. Embedded in the analysis are recommendations on the role of capacity building and technical assistance.

6.1 Regional trade agreements

This section focuses on the identified priority areas for developing countries to shift to circular textiles while addressing how the spill-over effects of the ESPR can be tackled through different provisions in regional trade agreements (RTAs). The analysis is based on the seven priority areas set out in the previous chapter.

6.1.1 Promoting and facilitating circular investments and investments of relevance to the circular textiles and apparel

A key theme that has been identified in the case studies and subsequent analysis is the importance of increasing investment in areas that would render textile production more circular, such as investment in the infrastructure and/or know-how relevant to developing post-industrial waste-textile waste management and investment in product design and innovative fibre development. Moreover, investment will be required in greening textiles production through enhancing resource efficiency, low-carbon technologies, waste management, etc. Investing in the relevant digital infrastructure will be essential.

There are three main ways in which RTAs can be leveraged to increase investment in these areas. First, RTAs can include language that ensures that governments preserve the right to establish non-discriminatory regulations aimed at fostering a circular economy transition in the textiles industry (Bellmann and Sell, 2021). RTAs could also include specific commitments to facilitate and promote investments in the circular economy for textiles. For example, this has been done under the EU-China Comprehensive Agreement on Investment,

which states that the parties shall: promote and facilitate investment of relevance for climate change mitigation and adaptation including investment concerning climate-friendly goods and services, such as renewable energy, low-carbon technologies and energy efficient products and services, and by adopting policy frameworks conducive to the deployment of climate-friendly technologies (section IV, sub-section 2, Article 6(b)).

Similar language could be added that is relevant to the circular economy and textiles.

Second, an RTA could require that investors in the textiles and apparel industry comply with specific obligations. At a basic level, this would involve requiring that investors comply with relevant host-country regulatory frameworks, such as EPR or environmental regulations relevant to waste management. In addition, countries could require that investors in the textiles and apparel industry comply with the requirements set out in the ESPR. Doing so would ensure that the ESPR would not become a non-tariff barrier and, at the same time, would have the added benefit of bringing in the required machinery and technology to do so. Encouraging co-operation with local businesses would also lead to technology transfer. Moreover, a requirement could be established to focus on circularity when conducting impact assessments as part of investors' pre-establishment and post-establishment obligations (Bellmann and Sell, 2021).

Third, RTAs can be leveraged by strategically opening a country's market to foreign investment in services relevant to developing sustainable and circular textiles. This would include investment in product design, collection of material for recycling, recycling technologies, etc. Not all of these correspond to services categories set out in the Service Sectoral Classification W/120, typically used as a basis for services schedules in FTAs. For example, it does not contain subcategories for waste recycling or product-design services. In that case, RTAs can be used to develop additional subcategories. For example, in the EU-Vietnam FTA, "recycling services" has been added as a subcategory.[9] More recently, the EU-New Zealand FTA contains more detailed subcategories relative to circular economy services that could be relevant in the context of circular textiles, such as engineering design services for industrial processes and production, manufacturing of renewable energy and related products, and engineering design for mechanical and electrical installations for buildings (EU-New Zealand FTA, Chapter 19, Annex B).

Moreover, as highlighted in the case studies, circular services and digital solutions often go together. This means that under RTAs, it would be appropriate to include commitments on data flows (Bellmann and Sell, 2021).

6.1.2 Increasing access to critical technologies necessary to advance the transition to a circular textiles industry

Critical to a shift to circular textiles in developing countries is access to relevant technologies, including technologies that have developed nature-based fibres, enhance product design, render the production process more efficient, involve state-of-the art recycling technology and employ technology relevant to render supply chains more transparent by product tracking. Many of the cutting-edge technologies that will be critical to advance the transition to circular textiles are developed in innovation centres in advanced economies, which highlights the importance of technology transfer.

9 The EU has also added recycling services to the EU-Korea FTA and the EU-Singapore FTA.

RTAs can play an important role in facilitating the transfer of technology – the movement of data, designs, technical knowledge, etc. – from one organisation to another. For example, this can be done by including commitments to make available technologies that are critical for developing countries' circular textiles opportunities and challenges. An interesting example is the Nicaragua-Taiwan FTA which provides in Annex 19.08 that environmental co-operation includes facilitation of technology development and transfer (Taiwan-Nicaragua FTA, Annex 19.08). Similarly, the Switzerland-China FTA provides for technology transfer and co-operation on environmentally friendly technologies (Switzerland-China FTA, Art. 12.5). Other examples include the EU-CARIFORUM EPA, which contains provisions on the transfer of technology, with the parties "agreeing to exchange views and information on their practices and policies affecting transfer of technology".[10] It further provides that the parties shall "create an adequate enabling environment for technology transfer in the host countries and prevent or control licensing practices or conditions pertaining to IPR which may adversely affect international transfer of technology". Moreover, it provides that the EU "shall facilitate and promote the use of incentives granted to institutions and enterprises in its territory for the transfer of technology to institutions and enterprises of the CARIFORUM States" (EU-CARIFORUM EPA, Article 142).

Similar language on transfer of technology can be included to advance the sharing of information and practices relevant to transitioning to a circular textiles industry. Depending on the characteristics of the country's apparel and textiles industry, these could focus on developments of alternative, nature-based fibres, or tracing technologies necessary for digital passports. The RTA could also make specific reference to facilitating technology transfer and promoting co-operation and innovation in sustainable and circular textiles technology, including through collaboration with the private sector. This is further elaborated upon in section 6.1.6 below.

Another way to advance technology transfer is through encouraging joint ventures between local textile and apparel businesses and the foreign investors that typically bring in technology. For example, when providing licences to textile businesses to operate in a special economic zone, officials could develop requirements related to the sharing of technology relevant to a circular economy transition.

6.1.3 Incentivising circular apparel and textile production through procurement

Government procurement, which is the process by which public authorities purchase works, goods or services from companies, could also play a role in stimulating a transition to a circular textile and apparel industry (Bellman and Sell, 2021). Authorities could use public procurement to steer the economy in a more circular direction by providing space for sustainable procurement. RTAs can reflect this, including by confirming the right to discriminate in the procurement process based on environmental criteria. For example, prior to signing CETA, the EU and Canada adopted a Joint Interpretative Instrument, clarifying that environmental, social and labour-related criteria could be used in public procurement processes, without violating non-discrimination provisions (Bellmann and Sell, 2021).

10 Other interesting provisions relevant to technology transfer can be found in Article 8 of the proposed India-EU FTA and Article 231 of the EU-Central America Association Agreement.

6.1.4 Facilitating access to goods and services relevant to circular textile and apparel

RTAs can also play an important role in facilitating access to relevant goods and services that developing countries would require as they seek to transition to a circular textiles industry. With respect to goods, this would require the country to identify the types of goods that are needed to foster the circular textiles transition. These goods will likely include various types of machinery and equipment needed at the recycling stage – mechanical and/or chemical recycling – as well as the chemicals and other materials that are used in these recycling processes. In addition, this will include sustainable fibres, such as recycled synthetics, organic cotton or newly developed fibres created from natural materials. The latter is especially important for countries that spin fabric and thus import relevant material inputs.

Once these relevant inputs have been identified, the next step would be to reduce import tariffs on these products. It might be that the six-digit HS code does not provide sufficient detail to allow for differentiation between regular machinery and textile waste-management machines, or between fibres made from cotton and fibres made from recycled cotton. In such a situation, countries can consider adding more subcategories to the HS code to enable differentiation.[11] The EU-New Zealand FTA highlights the "importance of facilitating trade and investment in goods that contribute to climate change and preservation of the environment", and includes an illustrative list of such goods, for which the importance of trade liberalisation is recognised. This includes various goods and services relevant to enhancing circular textiles, such as various goods to enhance energy efficiency and various renewable energies. In future, it would be important to also include references to goods specific to additional developing circular industries, including in textiles, such as recycling machinery.

Importantly, considerations regarding tariffs on relevant inputs to advance circular textiles will have implications not only for trade with the EU (for instance, machine imports) but also for trade arrangements between the textile and apparel-producing countries and their input suppliers, which, for the countries studied, are mostly Asian countries. Thus, these agreements must also be analysed.

For services, this would include identifying services necessary for advancing the circular economy transition, such as post-industrial textile-recycling services, product-design services, telecommunications and digital services to enhance traceability, etc. Given that these services are not classified in the W/120, it will require adding these and other categories to the list of services commitments of countries. Such categories could either be labelled as "circular economy services" similar to the EU-New Zealand FTA, or could be integrated more generally into existing services schedules. For developing countries that do not have a competing services industry, liberalising services in areas relevant to developing circular textiles will be critical to tap into the identified opportunities in the previous section.

6.1.5 Reducing the potential of the ESPR to become an NTB

There is a risk that the ESPR becomes a non-tariff barrier. This would happen when products produced in developing countries

11 At the WTO level, negotiations took place to reduce tariffs and non-tariff measures on environmental goods and services. However, these negotiations became inactive due to little progress.

do not comply with the ESPR product standards. This can also happen when the process to demonstrate compliance, the conformity-assessment procedures, are unnecessarily restrictive.

RTAs tend to include a Technical Barriers to Trade (TBT) Chapter, that seeks to minimise trade barriers imposed by technical regulations, standards and conformity-assessment procedures. Typically, TBT provisions encourage transparency in standard setting, mutual recognition or the harmonisation of standards, regulations and conformity assessments. These concepts are further explained in Box 4. With respect to harmonisation, TBT provisions could provide a list of standard-setting bodies and require that these standards should be considered by the parties. TBT provisions could also require the parties to consider adopting relevant standards adopted by the other party. Most circular economy measures, such as the ESPR, are adopted at the national level. This is in part because few relevant international standards related to circular production exist.

However, as highlighted in Box 3, the International Organization for Standardization (ISO) is currently in the process of developing several standards with relevance to the circular economy. In this respect, RTAs could require parties to base their circular economy measures on relevant international standards where they exist, and/or encourage parties to participate in the development of relevant international standards. The ISO has already committed to involving more exporters and stakeholders from developing countries in the development of the circular economy standards (Ashraf and van Seters, 2021). The fact that the EU's ESPR is in its initial stages presents an opportunity for co-operative action between regulating states and stakeholders within the textiles and apparel value chain.

In addition, RTAs could contain provisions that "recognise as equivalent" several specific circular economy standards/frameworks, such as ecodesign standards, or extended producer responsibility (EPR) frameworks. However, equivalence presupposes the existence of technical regulations or standards that can be considered to reach an equal level of protection. As demonstrated by the case studies, a general dearth exists with respect to the adoption of government regulations in developing countries around ecodesign standards. This highlights the importance for developing country governments to adopt relevant regulatory frameworks.

It would also be interesting to explore to what extent voluntary sustainability standards (VSS) could be considered equivalent to government standards/technical regulations through TBT provisions. Indeed, as noted in the case studies, companies that have been certified by a variety of sustainability standards will be likely to experience fewer difficulties in meeting ESPR requirements. Indeed, the ESPR notes that products that are certified with the EU Ecolabel will be presumed to comply with the ESPR. Such presumption of compliance could be expanded to include some well-respected, widely used voluntary sustainability standards. In this regard, RTAs – or the ESPR itself – could note that compliance with a selected list of VSS could be presumed to reach equivalent levels of environmental protection compared to the ESPR. This would significantly reduce the burden on key exporting companies in developing countries to demonstrate compliance with the ESPR. A key challenge of developing this would be to decide what standard(s) to select and on the basis of what criteria.

Box 4. Explaining equivalence, mutual recognition and harmonisation

Harmonisation: This refers to the application of uniform regulations, standards or conformity assessments. To achieve this, PTAs tend to encourage parties to use existing international standards as a basis for their national regulations. PTAs can also encourage parties to use regional standards as the basis of harmonisation.

Equivalence: The equivalence concept is based on the fact that regulatory goals can be fulfilled by different kinds of measures. The importing country recognises the "equivalence" of the objectives and conformity assessment of the exporting country for a certain product to that of its own, even if they are not the same. The recognition of equivalence makes it possible to maintain distinct national regulatory measures while removing the measures' trade restrictive effects.

Mutual recognition: Another way in which trade can be facilitated is through accepting regulatory differences by way of mutual recognition, that is, two or more parties mutually recognise elements of the other country's regulatory regime – regulatory requirements, standards and results of conformity assessments – as yielding functional equivalence to the standards and regulation in the other country. Mutual recognition arrangements can cover both rules (technical regulations and standards) and conformity assessments.

Most often, however, mutual recognition finds expression through mutual recognition agreements of conformity-assessment procedures. Their purpose is solely to avoid duplicative testing in international trade – but equivalence or acceptance of technical requirements, regulatory objectives or conformity assessments is not required. Rather, what is mutually recognised is (i) the technical competence of a specific conformity assessment body in the export country to perform conformity assessment at the expected level of the import country; and (ii) the knowledge of these bodies about the technical requirements and conformity-assessment bodies in the import country.

Source: adopted from Bellman and van der Ven (2020), "Greening Regional Trade Agreements on non-tariff measures through technical barriers to trade and regulatory co-operation."

Linking VSS to obligations under an RTA is nothing novel. For example, under the EFTA-Indonesia CEPA, preferential tariffs for palm oil are rendered conditional upon meeting sustainability requirements. Subsequently, the Swiss government identified four standards relevant to palm oil sustainability, including VSS, that would enable a company to prove sustainable production. Moreover, the UK-New Zealand FTA highlights the important role voluntary mechanisms can play in contributing to high levels of environmental protection.

Perhaps the most straightforward way in which TBT chapters can be leveraged to minimise trade friction generated by the ESPR is through including provisions that encourage parties to mutually recognise conformity-assessment procedures. The EVFTA is a good example of an RTA that already encourages the parties to do so. Specifically, it provides a list of ways to facilitate the acceptance of the results of conformity-assessment procedures conducted in the territory of the other party, such as reliance on a supplier's declaration of

conformity, use of regional and international multilateral recognition agreements and arrangements, and unilateral recognition (EVFTA, Article 5.6). These provisions could be used as the basis on which conformity-assessment procedures carried out by developing countries to demonstrate compliance with the ESPR could be mutually recognised by the EU, thus reducing additional testing requirements.

6.1.6 Special and differential treatment / technical assistance

Special and differential treatment provisions allow developing countries and least-developed countries more flexibility with respect to specific obligations in trade agreements. Together with technical assistance, this will be critical in ensuring a just circular textiles transition. Specifically, RTAs can contain language that, with respect to newly adopted regulations, would offer longer timelines for compliance for developing countries, and perhaps even longer for SMEs below an identified revenue threshold.[12]

For technical assistance to be effective, it must be designed in full collaboration with the recipient country, and address specific challenges and opportunities identified in the country at issue. For example, if the textile and apparel production in a recipient country is made up of a mixture between polyester and cotton, such as in Sri Lanka or Vietnam, post-industrial waste-recycling challenges will be different compared to a country like Bangladesh that focuses mostly on cotton fabrics. For many developing countries, however, detailed studies of the challenges and opportunities relevant to circular textiles are missing. This suggests that one area of technical assistance can focus on the process, that is, funding detailed technical studies that analyse specific opportunities and challenges in textiles specific to different trading partners and link these opportunities and challenges to relevant trade-related interventions.

Such a study would serve as a basis on which specific interventions can be identified. For example, one country might be able to benefit more from mechanical recycling, whereas another country would have opportunities in circular design. Similarly, one country might be ideally positioned to export circular textiles and apparel products, whereas another country shows promise in developing nature-based fibre substitutes. In other words, what is important is that technical assistance provisions are specifically tailored to the needs of the developing country. The importance of customising technical assistance and capacity building to the needs of different countries is also reflected in the European Commission's proposal to amend the Trade and Sustainable Development (TSD) chapters (European Commission, 2022f).

Through RTAs, countries could also agree to co-operate and share information on best practices relevant to the circular economy transition in developing countries. This could be captured by RTA provisions that focus on information sharing. However, RTAs and other trade arrangements will likely not be sufficient to do so. Aid-for-trade initiatives and development co-ordination will also play an important role (Barrie and Schröder, 2021; Kettunen et al., 2019; UNEP and IRP 2020). This is further explored in section 6.2.

12 Specifically with respect to the ESPR, such flexibility could be built into the ESPR directly. Moreover, the ESPR could build in special and differential treatment provisions similar to the Trade Facilitation Agreement (TFA), which renders compliance with a subset of ESPR provisions conditional upon receiving adequate technical assistance.

6.1.7 Sector-specific provisions

RTAs could also include sector-specific annexes or chapters that focus explicitly on enhancing circular economy opportunities. Indeed, sector-specific annexes for a variety of products or issues have been developed in RTAs, including for sectors such as chemical substances, motor vehicles, energy performance standards, organic products, animal welfare, agriculture and renewable energy (Bellmann and van der Ven, 2021). The specific commitments set out in these annexes vary from information exchange to co-operating towards a particular objective. Some sector-specific provisions seek to enhance regulatory compatibility through harmonisation, mutual recognition or unilateral recognition, or through commitments to co-operate on test procedures and performance standards.

Another example of a sector-specific sustainable focus is the Chapter on Sustainable Food Systems which is part of the recently agreed EU-New Zealand FTA (Chapter 7). This sector-specific sustainability chapter focuses on co-operation between the parties on priority issues relevant to developing sustainable food systems, including through exchange of information, expertise, experiences and co-operation in research and innovation. Specific areas for co-operation highlighted in the chapter include food production methods and practices, including organic and regenerative farming, the efficient use of natural resources and agricultural inputs, including reducing the use and risk of chemical pesticides and fertilisers, the environmental and climate impacts of food production, contingency plans to ensure resilience of food supply chains, sustainable food processing and the carbon footprint of consumption.

Similarly, a future RTA could include a sector-specific chapter or annex focused on resource efficiency and the circular economy. While sectors other than textiles will be important for developing countries, for those countries in which trade is dominated by textiles, such as Bangladesh, it would make sense to focus on developing an RTA chapter specifically focused on circular textiles. The sector-specific approach could include provisions through which the parties shall "endeavour to recognise as equivalent" several relevant standards, such as standards related to ecodesign or EPR. It could also reflect co-operation around digital passports. The benefit of adopting a sector-specific annex is not only that it signals the importance of the area for trade between the parties, but also that it is more specific, highlighting priority areas for collaboration. Moreover, by including a reference to establishing a subcommittee to monitor implementation, a sector-specific chapter would also put more pressure on implementation.

6.2 Unilateral preference arrangements

In addition to RTAs, unilateral preference programmes will play an important role in ensuring that the circular economy transition for textiles is inclusive of developing countries. Indeed, as highlighted earlier, both Sri Lanka and Bangladesh currently trade under the GSP scheme. The EU GSP scheme consists of three different arrangements: the Everything but Arms programme (EBA) which sets out unconditional market access for least-developed countries (LDCs); the GSP+ Scheme, which provides duty-free market access for two thirds of all tariff lines conditional upon compliance with various international treaties; and the standard GSP scheme which is non-conditional but combines providing partial or full removal on two thirds of all tariff lines.

Generally, there is little convergence between the EU's GSP schemes and the CEAP. In the European Commission's proposal to update the GSP Regulation, submit-

ted in 2021, an attempt has been made to strengthen the link between the Green Deal and GSP by introducing negative conditionality to environmental and good governance conventions – as opposed to human rights issues only (European Commission, 2021b). This would mean that preferences could be taken away if a country is found to be in violation of various environmental commitments and treaties.

Strengthening the "stick" side of the GSP scheme to incentivise sustainability would not, however, help developing countries to exploit untapped opportunities to move to a circular textiles and apparel industry. Rather, to ensure that the ESPR does not become a non-tariff barrier to exporting textile and apparel countries, EU members must also focus on the "carrot" side of GSP and commit to providing technical and financial assistance through green Aid-for-Trade programmes for all EBA and GSP+ countries (IEEP, 2020: 2). This technical and financial assistance must be tailored to the specific challenges and opportunities relevant to developing a circular textile and apparel industry in specific developing countries, as highlighted earlier.

In this regard, an approach could be developed whereby a set budget – aimed at making the textile and apparel industry more circular and facilitating compliance with the ESPR – would be made available automatically to GSP beneficiaries whose exports to the EU of textile and apparel products comprise 50% or more of the country's total GSP exports to the EU.[13] Priorities on how to use such technical and financial support must be discussed through dialogues with the relevant GSP beneficiaries. As highlighted in the case studies above, this could focus on enhancing post-industrial textile waste recycling by investing in the required infrastructure or training workers to ensure they can enhance product design to render the products more durable. In addition, it would be especially important to incentivise companies to adopt more circular business models, including in the design phase.

More generally, support should be provided not only on a project-specific basis, or to develop export capacity, but also to governments as they develop an overarching legislative framework and/or circular economy strategy and road map, to guide the transition from linear to circular textiles. An example of this is the support provided by the European Commission to the implementation of Colombia's National Circular Economy Strategy, through the SWITCH to Green Facility (WBCSD, 2021; Barrie and Schröder, 2021). The SWITCH to Circular Economy Value Chains project funded by the commission, which seeks to connect EU headquartered multinational corporations working with suppliers in developing countries with circular economy experts, will also play an important role in this regard and should focus on GSP beneficiaries.

The 2017 update to the Aid-for-Trade strategy includes a reference to the circular economy and environmental sustainability. Indeed, it notes that "EU AfT support will play an important role in helping partner countries meet [circular economy] standards and themselves pursue the path towards a circular and green economy" (Directorate-General for International Cooperation and Development, 2021). This might be a good basis on which to further develop specific programmes that support circularity in the textiles and apparel sector.

6.3 Summary observations

This section has demonstrated how RTAs can be leveraged to advance circular economy activities in the textile and apparel

13 The downside of this approach is that it does not incentivise export diversification.

sector in developing countries while mitigating any trade barriers associated with the ESPR. It has highlighted the importance of strategically targeting investment, the importance of technology transfer and of lowering barriers to goods and services relevant to transitioning to circular textiles industries. Moreover, it has demonstrated how TBT provisions can be leveraged to reduce trade friction that could result from the ESPR and has proposed options for incorporating specific VSS into RTAs to facilitate recognition of equivalence with the ESPR. For an inclusive and just transition to circular textiles, targeted technical assistance will be indispensable.

A key take-away is that RTAs, when approached strategically, can facilitate a developing country's transition to circular textiles. A prerequisite to doing so involves identifying the specific opportunities and challenges in the country's textile and apparel industry, as well as any comparative advantage a country may have with respect to the circular economy as applied to the textile and apparel sector. As circular economy road maps and policies identifying the opportunities and challenges specific to circular apparel and textiles industries are lacking in many developing countries, this should be a key focus of technical assistance co-operation. Sharing information about best practices would be one way for RTAs to facilitate this. Another way to do so would be by focusing on capacity building through developing skill sets in areas such as post-industrial waste management, ecodesign, product traceability and general infrastructure support.

This section has further emphasised how to improve regulatory coherence between the EU's GSP scheme and the ESPR ecodesign requirements. It recommends that a budget be made available to facilitate compliance with the ESPR with respect to textiles and apparel for those GSP beneficiaries whose exports to the EU of textile and apparel products comprise 50% or more of the country's total EU GSP exports.

While this section has focused on the role of trade agreements, it is important not to overlook the role of the private sector. Given that design and other high-value activities related to the apparel and textile value chain are typically in the hands of multinational companies, they can play a critical role in catalysing the transition to circular textiles in developing countries. This can be done through technology transfer as a result of joint ventures between international brands and local businesses, and by ensuring that international clothing brands that invest in the developing countries are in a position to produce products that comply with the ESPR standards.

Another avenue to further explore is how to reflect some of the observations made in this section in the design of the ESPR and delegated act for textiles. For example, special and differential treatment provisions that provide more flexible transition times for developing countries could be built into the ESPR directly.

Finally, countries can explore avenues to co-operate on circular economy and related aspects outside the scope of a trade agreement, including through developing a "joint declaration" on resource efficiency and the circular economy. An example of this is the EU-India Joint Declaration on Resource Efficiency and the Circular Economy (2020). While pursuing this route tends to be quicker than the RTA route, such a joint declaration does not have treaty status, making it more a general endeavour document.

7 Conclusion and recommendations

This study has sought to better understand how the EU's push for a circular textiles and apparel industry, including through the ESPR, can be inclusive of developing countries. To answer this question, this study looked at different aspects of the circular economy as applied to apparel and textiles.

- It unpacked the requirements set out in the ESPR and other EU proposals relevant to a transition to circular apparel and textiles.
- It analysed the situation relevant to circular textiles and apparel in three key EU trading partners with active textile and apparel exports: Bangladesh, Sri Lanka and Vietnam, and drew key observations based on these studies.
- It linked case study findings to the ESPR requirements and identified various challenges and opportunities.
- It analysed how RTAs and the EU GSP system could serve as levers to address these challenges and opportunities.

Based on this analysis, a number of overarching conclusions can be drawn.

First, to better link regulations like the ESPR to opportunities and challenges in developing countries who are trading partners with the EU requires having detailed knowledge of specific characteristics in the exporting developing country. Indeed, a circular transition in textiles and apparel will look very different for a country like Bangladesh, which produces large volumes of 100% cotton waste, compared to Sri Lanka and Vietnam, where waste tends to be blended and thus more difficult to recycle. This, in turn, informs the country's circular transition. Thus, this study calls for additional, detailed, country-specific analyses focused on the challenges and opportunities associated with circularising the textiles and apparel industry.

Second, an inclusive and just transition to a circular economy will require additional engagement by developing countries with an active textile and apparel sector. Most of the circular textile initiatives identified in the three case studies are spearheaded by the private sector. There is a notable absence of government involvement in establishing textile waste-recycling frameworks, road maps and recycling incentives. It would be critical that developing country governments adopt the relevant legislative frameworks that provide incentives for waste management and related activities, including by setting recycling targets and through the adoption of EPR. It would likewise be critical for governments to develop circular economy road maps that adopt a strategic approach to the circular economy transition.

Third, the developing countries studied in this paper focus on enhancing circularity in the production process itself through waste management or reducing resources used. They do not focus on making more circular products through upgrading product design. As a result, they are anchored in low added value, downstream activities such as waste management. The strategic road map highlighted earlier could help developing countries identify where in the circular textiles and apparel value chain they would be able to reap most benefits, focusing on both economic opportunities and the environment. Moreover, the focus of developing countries on process versus product is misaligned with the ESPR, which predominantly focuses on circular characteristics set out in the product itself. This discrepancy must be considered as the ESPR and the delegated acts are further developed and become law.

Fourth, the private sector will play a critical role in facilitating the circular transition in developing countries. Many international brands that are active in developing countries already comply with various VSS. These companies will generally be better positioned to meet the ESPR's requirements. This would especially be the case for standards that seek to green the production process and VSS that focus on product performance. Moreover, design and other high-value activities related to the apparel and textile value chain are typically in the hands of multinational companies. This means that these companies can play a critical role in catalysing the transition to circular textiles in developing countries, including through technology transfer and by helping exported apparel products meet the more stringent ESPR standards.

Fifth, RTAs can be leveraged to advance circular economy activities in the textile and apparel sector in developing countries while mitigating any trade barriers associated with the ESPR. Areas of importance include strategically targeting investment, the importance of technology transfer and the importance of lowering barriers to goods and services relevant to transitioning to circular textiles industries. Moreover, TBT provisions can be leveraged to reduce trade friction that could result from ESPR. Targeted technical assistance will be indispensable for an inclusive and just transition to circular textiles.

Sixth, it is important to improve regulatory coherence between the EU's GSP scheme and the ESPR ecodesign requirements. To do so, this study recommends that a budget be made available to facilitate compliance with the ESPR with respect to textiles and apparel for those GSP beneficiaries whose exports of textile and apparel products to the EU comprise 50% or more of the country's total EU GSP exports.

Seventh, for an inclusive and just circular transition, it would be critical to reflect some of the observations made in this study in the design of the ESPR and delegated act for textiles. For example, special and differential treatment provisions that provide more flexible transition times for developing countries could be built into the regulation itself. There might be scope for this if the impact assessment to be conducted for the delegated act on textile and apparel products includes an analysis of the implications for textile and apparel-producing and exporting countries. Moreover, it would be critical that the process in which the delegated act for textiles is developed is inclusive and includes stakeholders from key apparel and textile-producing trading partners with the EU, both from the public and private sector.

To conclude, a circular textile and apparel transition that is inclusive of developing countries will not be automatic. It will only happen if the EU, developing country governments and the private sector collaborate on implementing identified opportunities while mitigating the challenges, including through the use of trade arrangements. To do so, a detailed understanding of relevant national and industry characteristics in those countries exporting textiles and apparel to the EU will be critical.

Annex 1. Comparing circular economy initiatives in case studies / VSS with ESPR product parameters

Product parameter as set out in the ESPR	Elaboration in annex 1	Bangladesh	Sri Lanka	Vietnam	Voluntary Sustainability Standards
Durability and reliability	This can be expressed through a product's guaranteed lifetime, technical lifetime, the mean time between failures, indication of real-use information on the product, resistance to stresses or ageing mechanisms	X	X	X	EU Ecolabel Global Organic Textile Standard (GOTS)
Ease of repair and maintenance	This can be expressed through characteristics, availability and delivery time of spare parts, modularity and compatibility with commonly available spare parts; use of standard components; ease of non-destructive disassembly and reassembly, etc.	X	X	X	
Ease of upgrading, reuse, remanufacturing and refurbishment	Number of materials and components used; use of standard components; ease of non-destructive disassembly and reassembly; conditions for access to product data; conditions for access to or use of technologies protected by IP rights	X	X	X	Organic Content Standard (OCS)
Ease and quality of recycling	Use of easily recyclable materials, safe and easy non-destructive access to recyclable components and materials and non-hazardous substances; material composition and homogeneity; possibility for high-purity sorting; use of component and material coding standards; number of complexity of processes and tools needed; ease of disassembly and reassembly	While this is not a focus in Bangladesh, the fact that most of Bangladesh's products are largely comprised of cotton would make them generally easy to recycle	X	X	Cradle to Cradle Organic Content Standard (OCS) Recycled Claim Standard
Presence of substances of concern	Avoidance of technical solutions detrimental to reuse, upgrading, repair, maintenance, refurbishment, remanufacturing and recycling of products and components	X	X	X	Better Cotton Initiative Global Organic Cotton Standard (GOTS) Oeko-Tex NATURTEXTIL Best Coop Naturaline: Bio Cotton Demeter Biodynamic EU Ecolabel
Energy use or energy efficiency	Use of substances, on their own, as constituents of substances or in mixtures, during the production process of products, or leading to their presence in products, including once these products become waste	X	X	Yes: eco-parks/ various laws and regulations	LEED Certification

Product parameter as set out in the ESPR	Elaboration in annex 1	Bangladesh	Sri Lanka	Vietnam	Voluntary Sustainability Standards
Resource use or resource efficiency	Consumption of energy, water and other resources in one or more life-cycle stages of the product, including the effect of physical factors or software and firmware updates on product efficiency and including the impact on deforestation	X	X	Eco-parks/ various laws and regulations	LEED Certification
Recycled content	Use or content of recycled materials	Yes	X	X	Cradle to Cradle Global Recycle Standard Recycled Claim Standard
Possibility of remanufacturing and recycling	Incorporation of used components	X	X	X	Cradle to Cradle
Possibility of recovery of materials	Quantity, characteristics and availability of consumables needed for proper use and maintenance	X	X	X	
Environmental impacts including carbon and environmental footprint	The environmental footprint of the product, expressed as a quantification, in accordance with the applicable delegated act, of a product's life-cycle environmental impacts, whether in relation to one or more environmental impact categories or an aggregated set of impact categories; the carbon footprint of the product; microplastic release; emissions to air, water or soil released in one or more life cycle stages of the product	X	X	Yes	CRI Green Label Carbon Neutral Certification Carbon Reduction Label CarbonFree Certified EU Ecolabel Fairtrade
Expected generation of waste materials	Amounts of waste generated, including plastic waste and packaging waste and their ease of reuse, and amounts of hazardous waste generated	X	X	X	Private standards

Bibliography

Additaya S. W. (2020), "BananaTex: Sri Lanka's revolutionary new fabric", Daily FT: www.ft.lk/Front-Page/BananaTex-Sri-Lanka-s-revolutionary-new-fabric/44-696377.

Agreement establishing an Association between the European Union and its Member States, on the one hand, and Central America on the other (2012): http://data.europa.eu/eli/agree_internation/2012/734/oj.

Akter M. M. K., Haq U. N., Islam M. M. and Uddin M. A. (2022), "Textile-apparel manufacturing and material waste management in the circular economy: A conceptual model to achieve sustainable development goal (SDG) 12 for Bangladesh", Cleaner Environmental Systems, 4, 100070: https://doi.org/10.1016/j.cesys.2022.100070.

Arora S. (2021), "Vietnam – A Huge Market for Textile Raw Material", The Textile Magazine: www.indiantextilemagazine.in/vietnam-a-huge-market-for-textile-raw-material/.

Ashraf N. and van Seters J. (2021), "The role of low- and middle-income countries in the circular economy transition of the Netherlands and the EU", European Centre for Development Policy Management (ECDPM): https://ecdpm.org/wp-content/uploads/Role-Low-Middle-Income-Countries-Circular-Economy-Transition-Netherlands-EUECDPM-Briefing-Note-142-2021.pdf-.pdf.

Ashraf N. and Van Seters J. (2022), "Sustainable fashion cannot stop at the EU border", ECDPM. https://ecdpm.org/talking-points/sustainable-fashion-cannot-stop-eu-borders/.

Bangladesh Garment Manufacturers and Exporters Association (BGMEA) (2021), "Embracing Circular Economy in Bangladesh Apparel Industry", The Apparel Story, October-November 2021: www.bgmea.com.bd/uploads/newsletters/apparel-story-october-november-2021.pdf.

Barrie L. (2019), "Crystal to scale up fabric waste recycling in Sri Lanka", Just Style: www.just-style.com/news/crystal-to-scale-up-fabric-waste-recycling-in-sri-lanka/.

Barrie J. and Schröder P. (2021), "Circular Economy and International Trade: a Systematic Literature Review", Circular Economy and Sustainability, pp.1-25. https://doi.org/10.1007/s43615-021-00126-w.

Bellmann C. and Sell M. (2021), "Options to Incorporate Circular Economy Provisions in Regional Trade Agreements. International Institute for Sustainable Development": www.sitra.fi/app/uploads/2021/06/options-to-incorporate-circular-economy-provisions-in-regional-trade-agreements.pdf.

Bellmann C. and van der Ven C. (2020), "Greening regional trade agreements on non-tariff measures through technical barriers to trade and regulatory co-operation", OECD: https://doi.org/10.1787/dfc41618-en.

Bocken N., Stahel W., Dobrauz G., Koumbarakis A., Obst M. and Matzdorf P. (2021), "Circularity as the new normal: Future fitting Swiss business strategies", PwC Switzerland: www.wwf.ch/sites/default/files/doc-2021-01/Circularity-as-the-new-normal_whitepaper-EN.pdf.

BSR (2021), "Keeping Workers in the Loop: Preparing for a Just, Fair, and Inclusive Transition to Circular Fashion": www.bsr.org/reports/BSR-Keeping-Workers-in-the-Loop.pdf.

CBI, Netherlands Ministry of Foreign Affairs (2021), "What is the demand for apparel on the European market?": www.cbi.eu/market-information/apparel/what-demand.

Department of Environment (2010), National 3R Strategy for Waste Management, Ministry of Environment and Forests, Government of Bangladesh: http://old.doe.gov.bd/publication_images/4_national_3r_strategy.pdf.

Directorate-General for International Cooperation and Development, European Commission (2021), EU aid for trade progress report 2021: review of progress on the implementation of the updated EU aid for trade strategy of 2017, Publications Office: https://data.europa.eu/doi/10.2841/018990.

Directorate-General for Trade, European Commission (2022), "Sri Lanka EU trade relations with Sri Lanka: Facts, figures and latest developments", European Commission: https://policy.trade.ec.europa.eu/eu-trade-relationships-country-and-region/countries-and-regions/sri-lanka_en.

Dissanayake D. G. K. and Weerasinghe D. (2021), "Managing post-industrial textile waste: current status and prospects for Sri Lanka", The Journal of The Textile Institute, 112:11, 1804-1810, DOI: 10.1080/00405000.2020.1845461.

Duhoux T. et al. (2021), "Study on the technical, regulatory, economic and environmental effectiveness of textile fibres recycling: final report", European Commission, Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs, Publications Office. https://data.europa.eu/doi/10.2873/828412.

Eco Intelligent Growth (EIG) (2021), "Pioneer Denim leads the Bangladesh textile industry towards the circular economy": https://ecointelligentgrowth.net/pioneer-denim-leads-the-bangladesh-textile-industry-towards-the-circular-economy/.

EFTA-Indonesia Comprehensive Economic Partnership Agreement (CEPA), European Free Trade Association (EFTA) and Indonesia (2018): www.efta.int/sites/default/files/documents/legal-texts/free-trade-relations/indonesia/efta-indonesia-main-agreement.pdf.

Ellen MacArthur Foundation (n.d.), "What is a circular economy?": https://ellenmacarthurfoundation.org/topics/circular-economy-introduction/overview.

Ellen MacArthur Foundation (2017), "A New Textiles Economy: Redesigning Fashion's Future": https://emf.thirdlight.com/link/kccf8o3ldtmd-y7i1fx/@/preview/1?o.

EU-CARIFORUM Economic Partnership Agreement (EPA) (2008): https://trade.ec.europa.eu/access-to-markets/en/content/eu-cariforum-economic-partnership-agreement.

EU-China Comprehensive Agreement on Investment, Section IV Investment and Sustainable Development, Sub-section 2 Investment and Environment, Article 6(b): https://trade.ec.europa.eu/doclib/docs/2021/january/tradoc_159346.pdf.

EU-India Joint Declaration on Resource Efficiency and Circular Economy, European Union and Republic of India (2020): www.consilium.europa.eu/media/45027/joint-declaration-with-india-on-resource-efficiency-and-circular-economy.pdf.

EU-New Zealand Free Trade Agreement, Chapter XX: Trade and Sustainable Development, Annex B, European Union and New Zealand (2022): https://circabc.europa.eu/ui/group/09242a36-a438-40fd-a7af-fe32e36cbd0e/library/d2577f61-f255-4413-b080-76674855703c/details.

EU-Vietnam Free Trade Agreement (EVFTA), European Union and Vietnam (2020): https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L:2020:186:FULL&from=EN#page=5

European Circular Economy Stakeholder Platform (n.d.)(a), "Infinited Fiber regenerates cotton-rich waste into brand-new Infinna textile fibers", European Economic and Social Committee: https://circulareconomy.europa.eu/platform/en/good-practices/infinited-fiber-regenerates-cotton-rich-textile-waste-brand-new-infinnatm-textile-fibers.

European Circular Economy Stakeholder Platform (n.d)(b), "Reverse Resources promotes upcycling of textile leftovers and creates supply chain transparency with online platform", European Economic and Social Committee (EESC): https://circulareconomy.europa.eu/platform/en/good-practices/reverse-resources-promotes-upcycling-textile-leftovers-and-creates-supply-chain-transparency-online-platform.

European Commission (n.d.), "About this initiative – Sustainable products initiative": https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12567-Sustainable-products-initiative_en.

European Commission (2009), Directive 2009/125/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for the setting of ecodesign requirements for energy-related products, Brussels: https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:32009L0125.

European Commission (2017) Commission Staff Working Document, Sustainable garment value chains through EU development action, SWD (2017) 147 final, Brussels: https://ec.europa.eu/transparency/documents-register/detail?ref=SWD(2017)147&lang=en.

European Commission (2020a), Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, A new Circular Economy Action Plan for a cleaner and more competitive Europe COM (2020) 98 final: https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1583933814386&uri=COM:2020:98:FIN.

European Commission (2020b), GSP statistics (1 December 2020): https://trade.ec.europa.eu/doclib/docs/2020/february/tradoc_158640.pdf.

European Commission (2021a), "EU Proposal – Chapter on Sustainable Food Systems": https://trade.ec.europa.eu/doclib/docs/2021/june/tradoc_159633.pdf.

European Commission (2021b), COM/2021/579 final, Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on applying a generalised scheme of tariff preferences and repealing Regulation (EU) No 978/2012 of the European Parliament and of the Council, Brussels: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM:2021:0579:FIN.

European Commission (2021c), COM (2021) 709 final, 2021/0367(COD), Proposal for a Regulation of the European Parliament and of the Council on shipments of waste and amending Regulations (EU) No. 1257/2013 and (EU) No. 2020/1056. Brussels: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52021PC0709.

European Commission (2021d), Roadmap, EU Strategy for textiles, Ref. Ares(2021)67453 – 05/01/2021: https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=PI_COM:Ares(2021)67453.

European Commission (2022a), Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, EU Strategy for Sustainable and Circular Textiles COM(2022) 141 final, Brussels: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52022DC0141.

European Commission (2022b), Proposal for a Regulation of the European Parliament and of the Council establishing a framework for setting ecodesign requirements for sustainable products and repealing Directive 2009/125/EC: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52022PC0142.

European Commission (2022c), Impact Assessment Report Accompanying the document Proposal for a Directive of the European Parliament and of the Council amending Directives 2005/29/EC and 2011/83/EU as regards empowering consumers for the green transition through better protection against unfair practices and better information, SWD(2022) 85 final, Brussels: https://ec.europa.eu/info/sites/default/files/4_1_186783_ia_sum_prop_em_co_en.pdf.

European Commission (2022d), "Green Deal: New proposals to make sustainable products the norm and boost Europe's resource independence", Brussels: https://ec.europa.eu/commission/presscorner/detail/en/ip_22_2013.

European Environment Agency (2019), "Textiles in Europe's Circular Economy", Briefing no. 10/2019: e27564dbf0f7462ea5c52e4c9aaf2775

Eurostat (2020), "Where do our clothes come from?", European Commission: https://ec.europa.eu/eurostat/web/products-eurostat-news/-/edn-20200424-1.

Fairtrade International (2016), "Fairtrade Textile Standard": https://files.fairtrade.net/standards/TextileStandard_EN.pdf.

Federal Ministry for Economic Development and Cooperation (BMZ) (n.d), "The Green Button helps with purchasing sustainable textiles": www.giz.de/en/worldwide/85043.html.

Federal Ministry for Economic Cooperation and Development (BMZ) (2022), "Green Button": www.gruener-knopf.de/en/gruener-knopf.

Fibre2Fashion (2022), "Turning Vietnamese garment industry sustainable essential: VITAS", Fibre2Fashion: www.fibre2fashion.com/news/apparel-news/turning-vietnamese-garment-industry-sustainable-essential-vitas-279810-newsdetails.htm.

Free Trade Agreement between the European Union and its Member States, of the one part, and the Republic of Korea, of the other part, European Union and Republic of Korea (2011): https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:22011A0514(01).

Free Trade Agreement between the European Union and the Republic of Singapore (2019): https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:22019A1114(01)&from=EN#page=1.

Free Trade Agreement between the Republic of China (Taiwan) and the Republic of Nicaragua (2006): www.sice.oas.org/trade/nic_twn/nic_twn_e/TWN_NIC_full_text_06_16_09.pdf.

Free Trade Agreement between the Swiss Confederation and the People's Republic of China, Swiss Confederation and People's Republic of China (2013): www.seco.admin.ch/seco/en/home/Aussenwirtschaftspolitik_Wirtschaftliche_Zusammenarbeit/Wirtschaftsbeziehungen/Freihandelsabkommen/partner_fha/partner_weltweit/china/Abkommenstexte.html.

Global Fashion Agenda and Boston Consulting Group, "Pulse of the Fashion Industry": (2017): https://globalfashionagenda.org/shop/pulse-of-the-fashion-industry-2017/.

Global Fashion Agenda (2022), "Policy Brief: Scaling Circularity in Garment Manufacturing Countries, such as Bangladesh": https://globalfashionagenda.org/resource/policy-brief-circular-fashion-partnership/.

GSP Hub (2022), "Bangladesh: What is the EBA?": https://gsphub.eu/country-info/Bangladesh.

Haseeb M., Kot S., Iqbal Hussain H., Mihardjo L. W. W. and Saługa P. (2020), "Modelling the non-linear energy intensity effect based on a quantile-on-quantile approach: The case of textiles manufacturing in Asian countries", Energies 13, no. 9 (2020): 2229.

Helsinki Times (2021), "Finnish sustainable textile company SPINNOVA one of the nominees for Cellulose Fibre Innovation of the Year 2022", Helsinki Times: www.helsinkitimes.fi/world-int/20542-finnish-sustainable-textile-company-spinnova-one-of-the-nominees-for-cellulose-fibre-innovation-of-the-year-2022.html.

Hirdaramani Group (n.d.), "Hirdaramani Group Partners with the Ellen MacArthur Foundations's Make Fashion Circular Initiative": www.hirdaramani.com/news/hirdaramani-group-partners-with.

House of Commons Environmental Audit Committee (HoC) (2019), "Fixing fashion: Clothing consumption and sustainability clothing consumption and sustainability", UK Parliament.

Huang J. (2021), "Bangladesh Publishes E-waste Management Rules", Chemlinked: https://chemical.chemlinked.com/news/chemical-news/bangladesh-publishes-e-waste-management-rules.

Husband L. (2021), "Vietnam apparel manufacturer cuts fabric waste by 2% with AI-based system", Just Style: www.just-style.com/news/vietnam-apparel-manufacturer-cuts-fabric-waste-by-2-with-ai-based-system/.

IfM (2017), "Turning waste into high value products in Sri Lanka", Institute for Manufacturing, University of Cambridge: www.ifm.eng.cam.ac.uk/insights/sustainability/turning-waste-into-high-value-products-in-sri-lanka/.

Infinited Fiber (2022), "Infinited Fiber picks site of shut paper plant in Finnish Lapland for its planned EUR 400 million textile factory investment", Infinited Fiber: https://infinitedfiber.com/blog/2022/06/20/infinited-fiber-picks-site-of-shut-paper-plant-in-finnish-lapland-for-its-planned-eur-400-million-textile-fiber-factory-investment/#:~:text=Infinited%20Fiber%20picks%20site%20of,fiber%20factory%20investment%20%2D%20Infinited%20Fiber.

Institute for European Environmental Policy (IEEP) (2020), "IEEP's response to the public consultation: Towards the future Generalised Scheme of Preferences Regulation granting trade advantages to developing countries": https://ieep.eu/uploads/articles/attachments/c527f72f-1c99-4383-ba65-31a671c91ef1/IEEP%20response%20to%20GSP%20public%20consultation%20-%20July%202020.pdf?v=63762649757.

International Development Systems (IDS) (n.d.), "Report on Vietnam Textile and Garment Industry", International Development Systems: www.ids.trade/files/actif_report_on_vietnam_textile_and_garment_industry.pdf.

International Finance Corporation (IFC) (2022), "IFC Engagement in Vietnam's Apparel Sector: How IFC Supports Vietnam's Position in the Global Apparel Supply Chain", International Finance Corporation, World Bank Group: www.ifc.org/wps/wcm/connect/5de86630-cba6-40cf-80d3-d5caf396be57/Brochure.Vietnam-03.pdf?MOD=AJPERES&CVID=lUGgbgw#:~:text=Vietnam%20Improvement%20Program%20(VIP),%2C%20and%20Levi%20Strauss%20%26%20Co.Islam

Islam M. I. (2017), "Rationalization of Bangladesh cotton import", Textile Today: www.textiletoday.com.bd/rationalization-bangladesh-cotton-import/#:~:text=Bangladesh%20is%20the%20world%27s%20largest,and%20different%20cotton%20growing%20industries.

Kabir M., Singh S. and Ferrantino M. (2019), "The Textile-Clothing Value Chain in India and Bangladesh: How Appropriate Policies Can Promote (or Inhibit) Trade and Investment", The World Bank. 10.1596/1813-9450-8731.

Kettunen M., Gionfra S. and Monteville M. (2019), "EU Circular Economy and Trade: Improving policy coherence for sustainable development", Institute for European Environmental Policy (IEEP): https://ieep.eu/uploads/articles/attachments/bdcfb1ce-e9b8-4226-8bef-4c60e4fa5250/EU%20trade,%20CE%20and%20sustainable%20development%20(IEEP%202019)%20FINAL.pdf?v=63750442959.

Kiron M. I. (2021), "First LEED Certified Green Garment Factories in Bangladesh", Textile Learner: https://textilelearner.net/green-garment-factories-in-bangladesh/.

Köhler A., Watson D., Trzepacz S., Löw C., Liu R., Danneck J., Konstantas A., Donatello S. and Faraca G. (2021), Circular Economy Perspectives in the EU Textile sector, EUR 30734 EN, Publications Office of the European Union, Luxembourg, 2021, ISBN 978- 92-76-38646-9, doi:10.2760/858144, JRC125110.

Korea Bizwire (2022), "Aurora IP – Pioneer of Vietnam's Green Textile Industry", Korea Bizwire. http://koreabizwire.com/aurora-ip-pioneer-of-vietnams-green-textile-industry/218459.

Laitala K., Klepp I. G. and Henry B. (2018), "Does use matter? Comparison of environmental impacts of clothing based on fiber type", Sustainability, 10(7), p. 2,524.

Loan N. T. P. (2011), "Greening textile industry in Vietnam", Wageningen University and Research. https://edepot.wur.nl/165758.

Ly H. (2022), "Greening" Textile and Garment for Sustainable Development", Vietnam Business Forum: https://vccinews.com/news/47634/%E2%80%9Cgreening%E2%80%9D-textile-and-garment-for-sustainable-development.html#:~:text=VITAS%20also%20set%20a%20%E2%80%9Cgo,time%2C%20build%2030%20international%20brands.

Mondal S. (2022), "How to reduce waste in the textile industry?", The International Growth Centre: www.theigc.org/blog/how-to-reduce-waste-in-the-textile-industry/#:~:text=Textiles%20are%20an%20integral%20part,economies%20in%20the%20developing%20countries.

Montfort J.-P., Chapova-Lepretere P. and Johnson K. (2022), "EU Proposal on New Ecodesign Requirements for Sustainable Products", Mayer Brown: www.mayerbrown.com/en/perspectives-events/publications/2022/04/eu-proposal-on-new-ecodesign-requirements-for-sustainable-products#Three.

Munasinghe M. (2019), "Sustainable Sri Lanka 2030 Vision and Strategic Path", Presidential Secretariat, Colombo, Sri Lanka: www.researchgate.net/publication/336000669_Sustainable_Sri_Lanka_2030_Vision_Strategic_Path_and_Sustainable_Development_Goals_SDG.

Nguyen T. (2020), "Seizing Investment Opportunities in Vietnam's Garment and Textile Industry", Vietnam Briefing, Dezan Shira & Associates: www.vietnam-briefing.com/news/seizing-investment-opportunities-vietnams-textile-garment-industry.html/.

Nguyen L. P. and Komarnisky R. (2022), "Vietnam: New extended producer responsibility regime – recycling and waste treatment obligations for certain producers and importers", Global Compliance News: www.globalcompliancenews.com/2022/03/19/vietnam-new-extended-producer-responsibility-regime090322/.

Oishee S. S. (2022), "Embracing circular economy in Bangladesh's apparel industry", Dhaka Tribune: www.dhakatribune.com/business/2022/01/11/embracing-circular-economy-in-bangladeshs-apparel-industry.

Pacini H. (2021), "Seizing the opportunities of a circular economy in textiles", UNCTAD: https://unctad.org/news/seizing-opportunities-circular-economy-textiles.

Park C. and Evans S. (2017), "TransTextile Project Report: High Value Innovation for Industrial Textile Waste in Sri Lanka", Institute for Manufacturing, University of Cambridge: www.ifm.eng.cam.ac.uk/uploads/Resources/TransTextile_Report.pdf.

Partnerships for Green Growth (P4G), "Circular Fashion Partnership": https://p4gpartnerships.org/pioneering-green-partnerships/all-p4g-partnerships/circular-fashion-partnership#:~:text=The%20Circular%20Fashion%20Partnership%20aims,system%20in%20garment%20manufacturing%20countries.

Pavarini M. C. (2021), "How Bangladesh could benefit from recycling cotton waste", *The Spinoff*: www.the-spin-off.com/news/stories/The-Materials-How-Bangladesh-could-benefit-from-recycling-cotton-waste-15973.

Razzaque M. A. (2021), "Bangladesh: En Route to LDC Graduation: Firm-Level Preparedness in the Textile and Clothing Sector", The Committee for Development Policy: www.un.org/development/desa/dpad/wp-content/uploads/sites/45/Garment-Study-Bangladesh.pdf.

Rengel A. (2017), "Recycled Textile Fibres and Textile Recycling: an Overview of the Market and its Possibilities for Public Procurers in Switzerland", Swiss Federal Office for the Environment, Bern, Switzerland.

Reverse Resources (n.d), "Circular Fashion Partnership officially launched": https://reverseresources.net/news/circular-fashion-partnership-launched.

Schröder P. and Wetterberg K. (2021), "Transitioning to a circular global textiles industry", Chatham House: www.chathamhouse.org/2021/04/transitioning-circular-global-textiles-industry.

Schumacher K. and Forster A. L. (2022), "Facilitating a Circular Economy for Textiles Workshop Report", NIST Special Publication, 1500, p. 207: https://nvlpubs.nist.gov/nistpubs/SpecialPublications/NIST.SP.1500-207.pdf.

Sri Lanka Apparel (2022), "Environmental Green Factories": www.srilankaapparel.com/environmental/.

Sri Lanka Export Development Board (n.d.), "Apparel and Textiles": www.srilankabusiness.com/apparel/.

Syrett H., Sawers C., Stenholm M. and Runnel A. (2021), "Scaling Circularity: Lessons learned from the Circular Fashion Partnership for building pre-competitive collaborations to scale upstream fashion systems", McKinsey and Company and Global Fashion Agenda Report.

United Nations Environment Programme (UNEP) (2020), "Sustainability and Circularity in the Textile Value Chain: Global Stocktaking": https://wedocs.unep.org/20.500.11822/34184.

UNEP and IRP (2020), "Resource Efficiency and Climate Change: Material Efficiency Strategies for a Low-Carbon Future", United Nations Environment Programme: https://wedocs.unep.org/bitstream/handle/20.500.11822/34351/RECCR.pdf?sequence=1&isAllowed=y.

UNFCCC (2021), United Nations Fashion Industry Charter for Climate Action: https://unfccc.int/sites/default/files/resource/Fashion%20Industry%20Carter%20for%20Climate%20Action_2021.pdf.

van der Ven C. (2015), "Where Trade and Industrial Policy Converge: How Developing Countries Can Utilize Trade Preferences to Generate Sustainable, Local Growth in the Garment Sector", International Lawyer. https://core.ac.uk/download/pdf/216908861.pdf.

van der Ven C. (2020), "The Circular Economy, Trade, and Development: Addressing spillovers and leveraging opportunities", Tulip Consulting: https://ea7f30b3-6555-4bf7-9210-2805bebede4d.filesusr.com/ugd/433d0a_aa1c0bf1aa11424881a33b9cea9c565e.pdf.

World Bank (2021), "Towards a Multisectoral Action Plan for Sustainable Plastic Management in Bangladesh", The World Bank Group, Washington D.C.: https://thedocs.worldbank.org/en/doc/42712a1018d536bb86c35018b9600c53-0310062021/original/National-Action-Plan-for-plastic-management-Dec.pdf.

World Business Council for Sustainable Development (WBCSD) (2021), "Reporting Matters: Time for a Shared Vision": www.wbcsd.org/contentwbc/download/13155/193072/1.

WWF Vietnam (2018), "Textile and Garment Sector in Vietnam: Water Risks and Solutions", WWF Vietnam: https://wwfint.awsassets.panda.org/downloads/2018_wwf_report_vietnam_textile_sector_water_risks_and_solutions_final.pdf.

WWF Vietnam (2021), "Guidelines for Greening the Textile Sector in Viet Nam", WWF Vietnam: https://wwfasia.awsassets.panda.org/downloads/greening_textile_sector_in_vn___eng.pdf.

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