Supporting SMEs & Creating a Sustainable Ecosystem for the Armenian Textile Industry

The project has been funded by the UK's Good Governance Fund (GGF) with UK aid from the British people.

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FASHION & DESIGN CHAMBER

Fashion and Design Chamber of Armenia NGO is a non-profit association founded in November 2017 with the main mission to strengthen the Armenian fashion and design sector by enabling it to be fully embedded in the local and international creative ecosystems. The goal of the FDC is the capacity and competitiveness of sector development through best international and innovative approaches, as well as presentation of Armenian textile, fashion and design industry in local and global markets. Today FDC unites under its roof more than 200 Armenian designers, brands and textile companies where they can have access to professional knowledge, skills, tools and network.

Operations of the FDC are:

• To provide a range of services that relate to sector's social, economic, technological, marketing and communication issues which are relevant to the entire spectrum of business functions as a whole

• To accompany the development of emerging brands by granting them financial and organizational support as well as overall expertise they need to structure and ease their development and exposure

• To train in traditional and new skills in the fields of creation, management and know-how aiming to maintain, share, enhance skills and knowledge

• To bring together fashion brands to foster collaboration and promotion of Armenian fashion and textile industry by combining traditional know how and contemporary technology

• To build the bridge between designers, artists, photographers, fashion and art experts, journalists, fashion and art personalities from around the world

• To organize fashion events, collection exhibitions, fairs, pop-up stores, presentations, showrooms, campaigns, etc

In order to achieve its goals and objectives, the FDC cooperates with public and private bodies, international organizations. From 2017-2019 FDC has started project on Establishment of Business Club for Fashion and Design implemented in the framework of EU4Business "Support to SME Development in Armenia" (SMEDA) project, which is co-funded by the European Union and the German Federal Ministry for Economic Cooperation and Development (BMZ) and implemented by GIZ's Private Sector Development in South Caucasus Programme. The main objective of the project was to create a joint platform for creative industry, specifically fashion and design cluster that will contribute to the development and enhance competitiveness of the sector. The target groups of the project were individual designers and brands, start-up and operating entrepreneurs from fashion and design related sector of Armenia, working age men and women, students and youth who are willing to work in this sector.

Later on, from Sept 2019 FDC has started "Supporting SMEs and Creating Sustainable Ecosystem for Armenian Garment Industry" project funded by funded by the UK's Good Governance Fund (GGF) with UK aid from the British people. The project focusses on three main directions:

1. Building capacity and supporting SMEs development and modernization, which will be achieved by upgrading business skills and technical knowledge in innovative fashion business.

2. Market penetration to position Armenian garment and textile products as high-end design goods, which will be achieved by promoting business networking and partnerships between textile/garment producers and sellers.

3. Enhancing sustainable production and recycling through creating sustainable supply chain model.

Today FDC serves as a perfect root for designers and textile companies to collaborate on other projects together. It provides an excellent opportunity to exhibit Made in Armenia unifies platform, its interpretation of Armenian culture and creativity, and to network with the wider creative community and beyond. With this selection of highly dedicated and inspiring founders' team the FDC shares a glimpse at the creative potential of Armenia and look forward into a bright and colorful creative future.

The main achievements so far are:

• The first international FASHION FORUM YEREVAN in 2018 and in 2019 with more than 550 participants where FDC brought together Armenian designers' community and foreign professionals to give master-class talks around the variety of topics. Among speakers were Hilary Alexander OBE, Martyn Roberts, Adam Katz Sinding, Antonio Mancinelli, Gwyneth Holland, and many others

• "Offsprings of Noah" and "Heritage" exhibitions and book publications showcased the best pieces of Armenian fashion designers (featuring 150 outfits of 80 designers from Armenia and diaspora)

• Over 25 PPD discussions with Governmental bodies and sector stakeholders

• Over 60 trainings and workshops with more than 200 designers and industry professionals

• Over 40 networking international events

• Study tours in Paris and Milan (visit to Premiere Vision Paris Fashion Trade Show and Milan Creative Hub)

• Over 50 Armenian designers' presentations in Milan, Moscow, Kyiv, London, Florence, Paris

• Over 40 new collections' development support

• Over 5000 pieces of international orders received etc

VAHAN KHACHATRYAN
DESIGNER, PRESIDENT OF FASHION & DESIGN CHAMBER
FOUNDER & DESIGNER OF VAHAN KHACHATRYAN BRAND

"I received a professional education in Academia Italiana Florence. Since, I have worked for Dolce & Gabbana, Alta Moda, Arti Minori srl and Sesto Fiorentino. I am always inspired by the study of culture, art, traditions, heritage and am enthusiastic in supporting the Armenian creative industry overall."

ELEN MANUKYAN
CO-FOUNDER, TEAM LEADER OF FASHION & DESIGN CHAMBER
CO-FOUNDER OF 5CONCEPT STORE REPRESENTING ARMENIAN BRANDS & LOOM WEAVING KNITWEAR BRAND

"I received Masters of Political Science and International Relations at the American University of Armenia, and have since worked for more than 15 years in the field of SME support; leading numerous educational, consulting, information and analytical programs."

ECO-AGE

Since 2006, Eco-Age has been the authentic, trusted voice and leader of change in the sustainable business world, serving as the strategic partner for progressive sustainability solutions and creative communications. Our current partners operate across several different sectors, including fashion, jewellery, textiles, mining, health care, sports, real estate, hospitality and lifestyle. Combining science and data with vision and creativity, we help companies not only future proof their business, but communicate it in a way that goes beyond the word "sustainability".

Eco-Age is a team of 24 sustainability strategists based in the UK and Italy, who are experts in creating tangible, transformative change, driving values through business.

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About This Report

This report, developed by Eco-Age and in partnership with the Fashion Design Chamber of Armenia (FDC), presents the findings and recommendations of a year-long project beginning in September 2019. The project, which has been funded by the UK's Good Governance Fund (GGF) with UK aid from the British people, looks at creating a Sustainable Ecosystem for the Armenian Fashion Industry, with a particular focus on circularity and methods for establishing a recycling system for the industry's textile waste. This report has been created with the ambition of providing solutions to help boost the socioeconomic role of the Armenian clothing industry, whilst simultaneously promoting best practice in order to raise the profile and significance of "Made in Armenia".

This report investigates and sets out opportunities for development of the sector, focusing on design, sourcing, waste management, collaboration and facilitation, informed by interviews and surveys of a representative selection of Armenian manufacturing companies. Topics of focus include analysing raw material sourcing and potential for capacity building for designers, as well as opportunities and challenges relating to establishing a national textile recycling system.

As part of this project, Eco-Age has also collaborated with FDC to run a number of in person and online sustainability-focussed workshops for key players in the Armenian fashion and textiles industry, including designers and manufacturers.

Executive Summary

In September 2019, Eco-Age and FDC partnered on a project to develop a more sustainable ecosystem for the Armenian fashion industry, with a particular focus on methods for establishing a recycling system for the industry's textile waste.

In order to obtain first-hand informationfrom key textile industry players in Armenia, a survey was conducted with 17 Armenian manufacturers (representing 20% of the total number of producers) from February-March 2020 to better understand current practices and potential opportunities in Armenia. Based on the survey results, a roadmap was developed across five key areas with the aim of providing solutions to help boost the socioeconomic role of the Armenian clothing industry, whilst simultaneously promoting best practice in order to raise the profile and significance of "Made in Armenia". The five areas that form the basis of the roadmap are: improving the sustainability knowledge of designers; implementing responsible sourcing practices; enhancing the collection of environmental and social data in the industry; investigating the feasibility of developing a recycling system in Armenia; and facilitating further collaboration and innovation to enable the industry to continue to move forwards.

The findings and recommendations across each of the five areas are summarised below:

Improving the sustainability knowledge of designers

Since the project started in 2019, the FDC has hosted a number of workshops for Armenian designers with support from Eco-Age and has been sharing resources and online communications with the fashion and textiles community on Facebook with links to industry reports and best practices in terms ofrelating to sustainability. In order to further support knowledge building in the country and inspire local designers and younger generations to incorporate sustainably thinking into all business operations, it was recommended that:

- The FDC continue to provide educational resources such as training and workshops for designers

- The Armenian government should review the universities and courses offering fashion and textiles learning and identify opportunities to integrate sustainability learning into existing curriculum

- Finally, the 2019 survey carried out with Armenian factories found that several manufacturers in Armenia currently store deadstock and are looking at new ways to reuse their materials scraps in localised supply chains to reduce waste. As new designers often lack access to the international textiles market, Armenia could look into establishing a materials re-use network

Implement responsible sourcing practices in order to meet international environmental and social standards

The survey conducted by Eco-Age also looked at the current sourcing practices of the industry, in order to understand the key materials sourced, as well as to make tailored recommendations. It was found that 94% of respondents use cotton in their production, followed primarily by man-made cellulosic fibres and synthetics, such as acrylic and polyester. China and Turkey were mentioned as top sourcing destinations at the time of the survey, however it is worth noting that following the pandemic, war and recently introduced trade ban over Turkish goods, it is likely that Armenian producers will stop sourcing products from Turkey. Key recommendations for Armenia include:

- Investigating opportunities to switch to lower impact options for key sourcing materials such as cotton and polyester

- Considering that the Armenian fashion and textiles sector wishes to expand to international markets such as the EU, Eco-Age has also advised carrying out, as well as involving standardisation checks around factors such as labelling and chemical use, in order to ensure compliance with the increasingly stricter legislative requirements of the European Union market

Implement a system for collecting and measuring environmental and social data within textile and garment production companies

Whilst the engagement rate for the survey conducted by Eco-Age and FDC was high and companies were able to provide detail on energy consumption and key materials sourced, it was found that factories weren't able to provide more in-depth detail for analysis. For example only five companies were able to detail methods of waste disposal, and not all companies could provide a breakdown of the fibre composition of their waste. Considering that one of the main objectives of the UK Good Governance funded project is to establish a textile recycling system in Armenia, some important next steps are:

- Manufacturers should establish which types of data they already collect and what data should be collected in future

- It would also be beneficial for FDC to carry out an annual survey with manufactures to identify key trends and baseline data, using the 2019 survey as a baseline

- Finally, the FDC could also offer resources for manufacturers that are at the beginning of their journey, in order to help them identify which types of environmental and social data they could begin to collect

Investigate the feasibility of developing a recycling system in Armenia

Based on the survey carried out by Eco-Age and FDC in 2019, is estimated that the Armenian garment industry produces around 570 tons of pre-consumer textile waste per year (40-45 tons per month). It was also found that cotton is the most common fibre type disposed of in Armenia, composing almost 50% of Armenia's textile waste.

- Based on research, and insight from industry experts, the volume of textile waste produced by the Armenian fashion sector alone is currently quite low, and therefore the sector could investigate partnering with other textile producing sectors in Armenia to increase volumes or exporting waste to neighbouring countries with more established recycling systems in place to divert waste from landfill

- If, however, waste volumes increase in line with planned expansion strategies that were devised prior to COVID, then there are opportunities to establish a collection and sorting system using one of the companies that completed the survey, 'Maralik', as it has the infrastructure in place to conduct mechanical recycling. In order to facilitate this process, it is recommended that FDC works more closely with the producers to understand the exact composition and volumes of textile waste, as well as continue to engage with 'Maralik' to understand challenges and opportunities it expects to face

Facilitate collaboration and enable innovation within the sector, furthering the work of existing organisations such as FDC

The final chapter looks at facilitation and collaboration of this project - particularly the role of the FDC and the Armenian government in driving forward a sustainable ecosystem for the fashion and textile industry. Recognising that public engagement can form an important part of facilitating widespread change, since beginning this project the FDC and Armenian government have worked on a campaign to raise public awareness of sustainability issues affecting the textile and fashion industries of Armenia.

- Such campaigns are important, especially if Armenia can establish a national recycling system to eventually incorporate post-consumer textile waste collection

- FDC could also strengthen its online offering and create a resource and knowledge hub, where it can store previous webinars hosted, such as those by Eco-Age

- It could also look to establish a working group in order to bring key voices together periodically to understand and discuss significant industry updates as well as challenges and opportunities

- Finally, the report suggests government driven incentives that could be implemented such as tax relief and procurement planning, the introduction of requirements around sorting textile waste, as well as supporting testing and standards to comply with European Union requirements
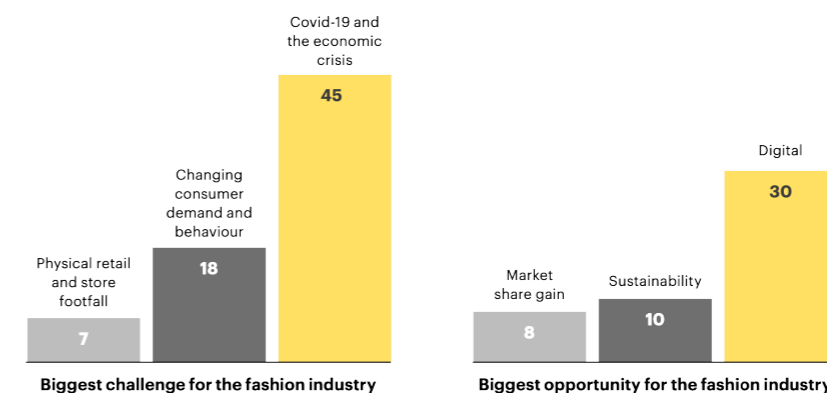
Introduction

WHY THE PROJECT?

The global fashion industry is one of the largest industries in the world, generating $2.5 trillion in global annual revenues before the 2020 COVID-19 crisis, **demonstrating the important value of clothing, shoes and accessories worldwide.**[1] However, whilst fashion has many benefits, two being generating employment and supporting the economy, the industry is also highly energy-consuming, polluting, and wasteful, and is rife with human rights abuses. These negative environmental and social impacts have been increasingly evident for a number of years, yet it is only more recently that the world has seen a **transitional shift in consumer demand with sustainability becoming a focal point**. Indeed, in 2019, McKinsey predicted that sustainability would be one of the biggest challenges faced by the fashion industry in 2020.[2] As a result, the fashion industry has seen increased pressure on both brands' and their suppliers to become more transparent about their business practices.

Fast-forward a year to the end of 2020 and the fashion industry has suffered its worst year on record with almost three quarters of listed companies facing financial issues. According to Boston Consulting Group (BCG), industry revenue in 2020 could drop by more than one-third - the equivalent of up to $640 billion in lost sales.[3] McKinsey Global Fashion Index analysis predicts that fashion companies will post approximately a 90% decline in economic profit in 2020, after a 4% rise in 2019.[4] While it is expected that job cuts will continue in to 2021 and industry players will be fighting to survive financially, i**t is also predicted that the COVID-19 pandemic will accelerate sentiments that were in motion prior to the global crisis, such as consumer demand for sustainability, fairness and social justice**. *(see Fig. 1)*

This prediction comes as t**he crisis has highlighted the conditions of the 40 to 60 million global garment workers who were impacted when orders were cancelled and payments were delayed**[5]**, causing suppliers to lose an estimated $16 billion in revenues**

Fashion executives expect Covid-19 and the economic crisis to be the biggest challenge in 2021 and digital to be the biggest opportunity

TOP THREE ANSWERS, % OF RESPONDENTS WHO MENTIONED THE WORD

Biggest challenge for the fashion industry: Physical retail and store footfall 7; Changing consumer demand and behaviour 18; Covid-19 and the economic crisis 45

Biggest opportunity for the fashion industry: Market share gain 8; Sustainability 10; Digital 30

SOURCE: BOF – MCKINSEY STATE OF FASHION 2021 SURVEY

FIG 1.
Source: McKinsey & Business of Fashion State of Fashion 2021

[1] McKinsey & Business of Fashion, State of Fashion 2021. [online]
[2] McKinsey & Business of Fashion, State of Fashion 2020. [online]
[3] BCG, Fashion's Big Reset 2020. [online]
[4] McKinsey & Business of Fashion, State of Fashion 2021. [online]
[5] Khambay, Alysha, "Garment workers are facing a humanitarian crisis – but don't blame COVID-19", Open Democracy, 2020. [online]

between April and June 2020.[6] Thousands of consumers have participated in the #PayUp campaign launched by Remake, which calls out brands that have not committed to pay for in-production or completed orders, subsequently putting millions of vulnerable workers at risk.[7] As public concern increases, **a growing number of brands have started to look at changes in their purchasing practices** and are partnering with suppliers across tiers, as the garment production and raw material stages are often the biggest emissions-savings levers.[8]

Governments are also taking action, as lawmakers around the globe look to move fashion companies away from voluntary initiatives toward taking legal responsibility for their supply chains.[9] Thus, human justice and ethics are likely to be a prevailing consumer concern as the fashion industry attempts to regain financial stability over the coming years.

Currently, Armenia holds a small share of the global textile manufacturing industry, and predominantly produces clothes made of imported fabrics, which do not involve fabric treatment. However, given that there are plans for expansion to production of fabrics, which may involve dyeing and finishing processes, this will increase the risk of potential environmental impacts and will require adequate post-industrial waste management. In such a small country as Armenia, the expansion of textile industry may result in major environmental, health and safety problems and will put a big question mark over the possibility of developing sustainable production. This is important for the Armenian textile and garment sector, as, prior to the pandemic, the Armenian Government had recognised the potential for the development of the textile and garment sector and its subsequent ability to boost the Armenian economy. Indeed, a number of factors make Armenia vulnerable to volatility in the global commodity

markets and to regional economic challenges, such as its geographic isolation, unresolved regional conflict with Azerbaijan and its narrow export base. Therefore, in 2011 the Armenian Government adopted the Export-Oriented Industrial Policy in order to increase the economy's resilience to external shocks and to create new development opportunities. **Within this policy, Armenia's light industry, including textile and clothing, footwear, leather and other production, appeared as a priority in the list of sectors for development.**

It is predicted that in the coming years following the global pandemic, fashion brands across the world will seek to more permanently diversify their geographic sourcing footprint and work more closely with suppliers to align on strategy.[10] This presents an opportunity for the Armenian garment and textile industry, which is comprised of a number of manufacturers with the potential to supply and work with such brands if they adapt to market opportunities and the aforementioned trends predicted to be accelerated by the global pandemic.

This project, financed by UK's GGF fund and implemented by FDC NGO in partnership with professional sustainability advisor Eco-Age (UK), aims at studying the key challenges for the development of this sector and considers how its potential can be realised while placing more emphasis on 'eco-production' and creating a base for a future shift to circular economy. In order to get an overview and understanding of current market best practices, a public-private dialogue will be established with a number of stakeholders including the Ministry of Economy; the Ministry of Education, Science, Culture and Sport; the Development Association of the Light Industry of Armenia NGO, UNIDO and other stakeholders in the field. The findings of the project will be used to influence government policy and reform for the Armenian fashion and textile sector.

MACROECONOMIC INSIGHT: ARMENIA

After the collapse of the planned Soviet economy in 1989 and Armenia's independence, Armenia's economy, which was predominantly industrial focused, started continuously declining until 1994. This was as a result of many factors, such as a war with Azerbaijan and a break away from trade relations and traditional export markets. Following this, the launch of ambitious economic liberalisation and expansion programs led to positive GDP growth until 2008. During this period the country established a strong banking system, managed to control inflation, stabilised its currency and privatised the majority of industrial enterprises. Armenia was showing strong two-digit economic growth between 2005-2008; however, when the global economic crisis of 2008-2009 hit, the Armenian economy suffered due to reduced export demand, a sharp decline in commodity prices and private capital inflows, and a drastic drop in Diaspora remittances which had previously accounted for 15-20% of Armenia's GDP. The crisis resulted in 15% decline of the GDP in 2009.[11]

In line with the stabilisation of the global economy, Armenia gradually recovered, manifesting sound economic growth over the next years, with the exception of a decline in 2015 and 2016 as a result of US and EU sanctions imposed on Russia, with which Armenia had strong economic links. In 2015, Armenia joined the Eurasian Economic Union with the aim of opening additional development perspectives through access to a market of 170 million people with joint GDP of over USD 2.7 trillion.[12]

In 2018 and 2019 GDP grew by 5.2% and 7.6% respectively, with GDP value of AMD 6,005 billion and AMD 6,552 billion (USD 12.4 billion and USD 13.6 billion respectively) *(see Fig. 2)*. The largest contributors to GDP in 2019 were Trade and Services (54.1%), followed by Industry (18.6%), Agriculture (11.6%) and Construction (6.2%).[13]

The international trade volumes in 2019 increased by around 10% from USD 7,388 million in 2018 to USD 8,154 million. The export constitutes USD 2,640 million, import USD 5,514 million with a negative trade balance of USD 2,874 million. The top 5 export countries of Armenia in 2019 were: Russia with 27.8% share (2018: 27.6%); Switzerland with 17.3% share (2018: 14.0%); Bulgaria with 7.9% share (2018: 8.9%); China with 7.3% share (2018: 4.4%); and Iraq with 6.7% share (2018: 6.2%). For the same period, the top 5 import countries for Armenia (as per origination of goods) were: Russia with 26.8% share (2018: 25.3%); China with 13.6% share (2018: 13.3%); Germany with 6.9% share (2018: 6.3%); Islamic Republic of Iran with 5.9% share (2018: 5.4%); and USA with 5.1% share (2018: 3.6%).[14]

According to the Index of Economic Freedom, in 2019, the Republic of Armenia was ranked 47th out of 186 countries based on trade freedom, business freedom, investment freedom, and property rights; and 8th for starting a business. Armenia holds the 41st position out of 190 economies in the Doing Business ranking, and its World Economic Forum's Global Competitiveness ranking improved from the 98th place in 2010 (out of 139) to 70th place in 2019 (out of 140).[15]

[6] McNamara, Mei-Ling "World's garment workers face ruin as fashion brands refuse to pay $16bn", The Guardian, October 8 2020. [online]
[7] Brooke Bobb, This Hashtag Unlocked $15 Billion of Lost Wages Due to Cancelled Orders From Gap, Levi's and Other Brands, Vogue, July 10 2020. [online]

[8] McKinsey & Global Fashion Agenda, Fashion on Climate, 2020. [online]
[9] McKinsey & Business of Fashion, State of Fashion 2021. [online]
[10] McKinsey & Business of Fashion, State of Fashion 2021. [online]

[11] Statistical Committee of the RA. [online]
[12] UNIDO, Improving Competitiveness of Export-Oriented Industries in Armenia through Modernization and Market Access: Phase II. July 2016 - 2019. [online]
[13] Statistical Committee of the RA. [online]

[14] State Revenue Committee of the RA: Information, Statistics. [online]
[15] UNIDO, Improving Competitiveness of Export-Oriented Industries in Armenia through Modernization and Market Access: Phase III. Januray 2020 - 2024. [online]
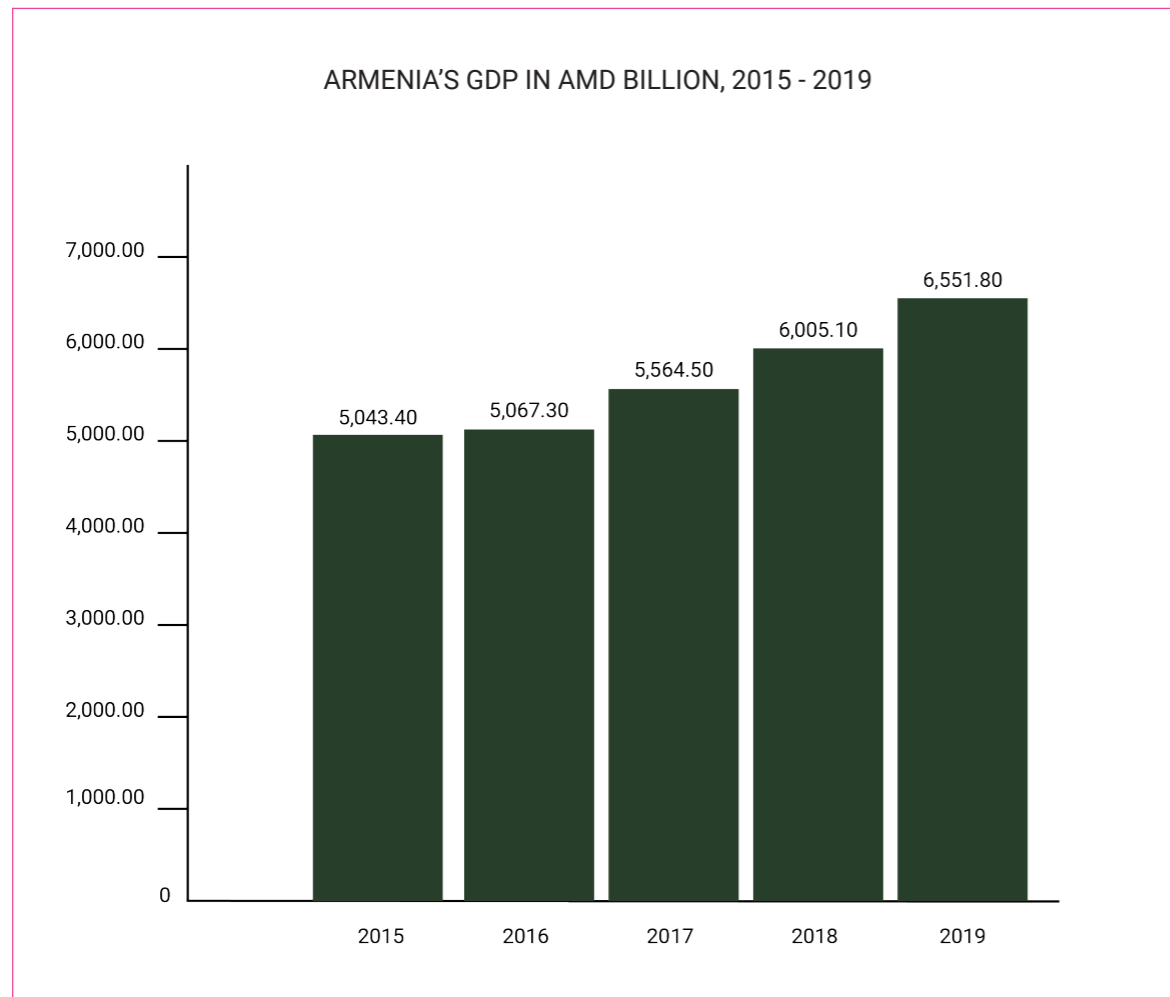
ARMENIA'S GDP IN AMD BILLION, 2015 - 2019

FIG 2.
Source: Statistical Committee of the Republic of Armenia

It is worth noting that since first commencing the research for this report in late 2019, the world has experienced the global outbreak of COVID-19, which resulted in a global shutdown of key economic activities, as well as the temporary suspension of trade. The impact and consequences of the pandemic are yet to be fully assessed, but it is likely that it will result in stagnation and downturn in many countries worse than that experienced following the 2008-2009 financial crisis. The changing nature of the pandemic requires regular forecast adjustments. As an example, at the end of April 2020, forecasts made by Armenian Government predicted a 2% GDP decline for 2020, while in May 2020 the EBRD estimated a 3.5% decline for the year. In September 2020, the Central Bank of Armenia predicted that country GDP will drop by 6.2%[16], however, taking into account the Karabagh war the actual current year result is likely to be even worse.

[16] Armbanks.am article. 'Armenian Central Bank says 2020 GDP drop will amount to 6.2%.' September 15 2020. [online]

OVERVIEW OF THE TEXTILE AND CLOTHING INDUSTRY IN ARMENIA

PRELUDE: COVID-19 AND THE TEXTILE AND GARMENT SECTOR

The Armenian garment and textile industry, like most industries worldwide, has been badly hit by the challenges and uncertainties brought on by the global pandemic. It is clear that the partial or full suspension of business activity during 2020, as well as countries closing their borders to trade, has caused long-term negative effects. Examples of impacts experienced by the global fashion industry include: suspended or cancelled orders, build-up of stock from previous seasons and a lack of stock for new seasons. While the pandemic is still ongoing, it is difficult to quantify the exact impact that this will have on the industry.

THE TEXTILE AND CLOTHING INDUSTRY IN ARMENIA

The textile and clothing industry was a well-established, labour-intensive industry in Armenia during Soviet times, employing about 150,000 people. After Armenian independence, the existing links and markets disappeared causing the collapse of the industry. Many factories were privatised but were unable to restart production for reasons including high transportation costs associated with the importation of raw materials, poor management, low access to financial resources, and lack of proper marketing.

However, during the last decade the sector has been slowly recovering thanks to the emergence of an increasing number of SMEs as well as investment by large companies, which has boosted the productivity and efficiency of the sector. The Armenian textile and garment sector is currently comprised of 106 large and small companies. In 2019, garment production constituted about 1.9% of the entire processing industry, and 1.3% of the total industrial output (2018: 1.7% and 1.2% respectively). Despite the relatively small size of the garment production as a percentage of Armenia's total production industry *(see Fig. 3)*, it plays important role in country, both economically and socially through employment generation.

COMPOSITION OF ARMENIA'S PROCESSING INDUSTRY IN 2019

- FOOD PRODUCTION (37.2%)
- BEVERAGES PRODUCTION (12.6%)
- TOBACCO PRODUCTION (13.4%)
- **GARMENT PRODUCTION (1.9%)**
- PRINTING, POLYGRAPHICS (1.5%)
- CHEMICALS PRODUCTION (1.3%)
- NON-METALLIC MINERAL PRODUCTION (5.8%)
- BASIC METAL PRODUCTION (11.4%)
- METALLIC GOODS PRODUCTION (1.2%)
- ELECTRICAL EQUIPMENT PRODUCTION (1.2%)
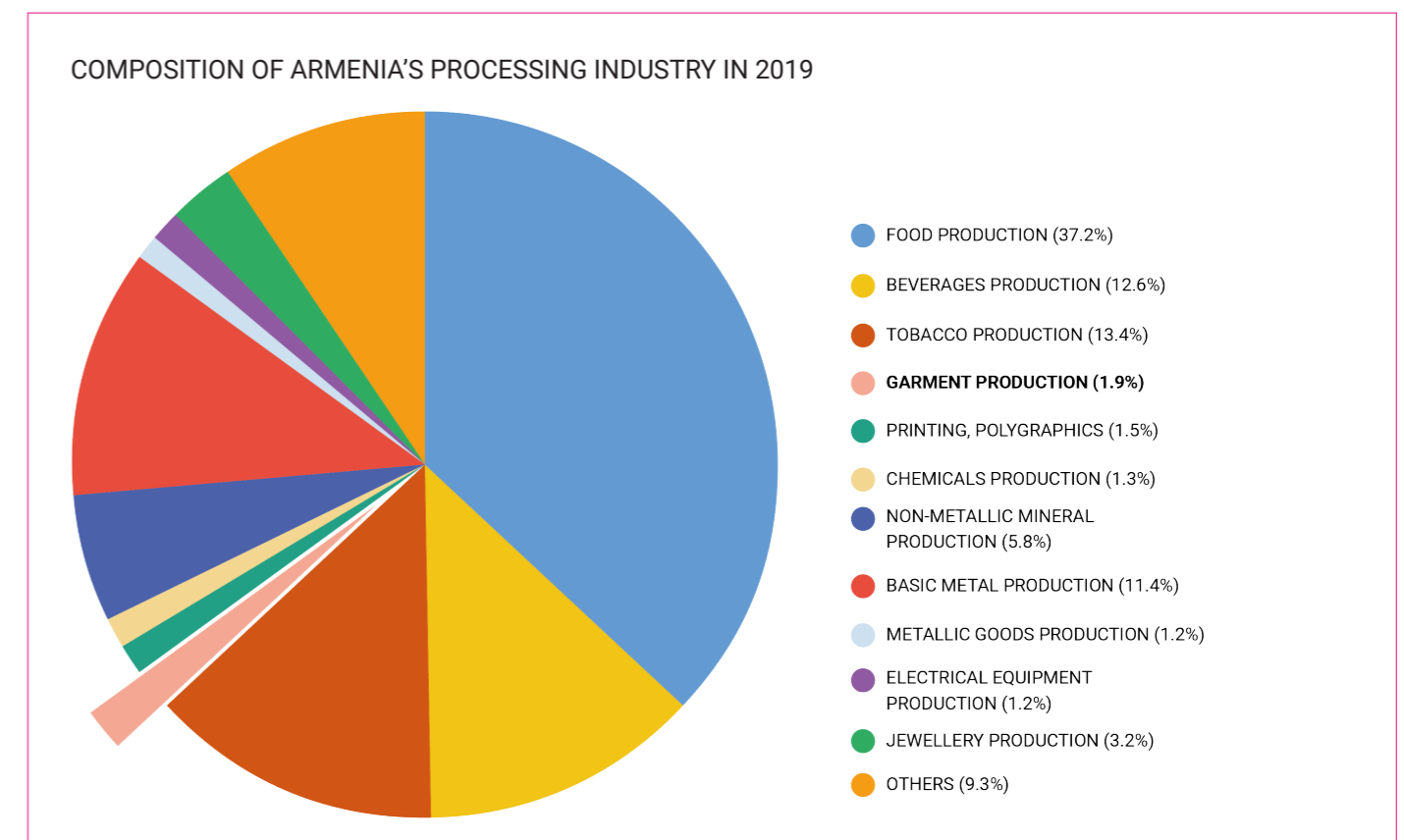- JEWELLERY PRODUCTION (3.2%)
- OTHERS (9.3%)

FIG 3.
Composition of Armenia's Processing Industry in 2019
Source: Statistical Committee of the Republic of Armenia. [online]

There is evidence to show the steady growth of this industry between 2018 and 2019; table 1 shows that clothing production value in 2019 amounted to AMD 27.7 billion (about USD 57 million) which was 23% more than that in 2018 (AMD 22.5 billion, or approx. USD 47 million).

Similarly, in 2019, the total estimated number of clothes produced in 2019 was about 28 million, an increase of 80% from 2018. In 2019, the clothing sector was comprised of 109 enterprises (3.9% of those registered in the entire processing industry in 2019) and 8,039 employees were involved in garment production (12% of Armenia's entire processing industry workforce in 2019) [17].

According to the State Revenue Committee, in 2019 the export value of garments was about USD 166 million, with the top export destinations being Russia – USD 86.5 million, Italy - USD 42.3 million and Germany – USD 31.5million.[18] Roughly 71% of the total realised production was exported in 2019 (vs 67% in 2018) with the big companies (more than 250 employees) making up the majority of these exports, exporting in aggregate about 90% of their total production. Smaller companies (up to 50 employees) on the other hand exported in aggregate about 33% of their production, however this is a large increase compared to 2018, when they exported 9% of total production.[19]

The big companies (more than 250 employees) generally work with foreign mass market brands such as Zara, Max Mara, Moncler, O'stin, (to name a few) and other foreign companies to produce down jackets, bubble coats, puffer jackets, corporate and professional uniforms, warm coats, underwear and other clothing. Production is organised based on sub-contracts where the Armenian companies receive fabrics, cuts, filling materials, accessories and other components, to assemble and produce the specified clothes and then export them back. Other Armenian companies are also producing clothes under their own brand names, some of which are exported. The distribution of clothing production by the type of output is presented in Table 2.

Prior to the COVID-19 pandemic, the numbers associated with the Armenian clothing industry were expected to grow along with the projected expansions of several companies. The global recession caused by the pandemic would of course adjust and delay those expansion plans, however, the recovery of the industry, which is expected in mid-2021, should provide Armenia with new development opportunities.

CHALLENGES FOR SECTOR DEVELOPMENT

The sector faces some key challenges, which must be addressed with immediate and long-term solutions if

TABLE 1: CLOTHING PRODUCTION VALUE IN ARMENIA IN 2018 AND 2019

	VOLUME OF PRODUCTION (CURRENT PRICES, AMD MILLION)		2019 / 2018 GROWTH	2019 STRUCTURE	2018 STRUCTURE
	2019	2018			
TOTAL PRODUCTION	2,103,914	1,935,262	8.7%		
PROCESSING INDUSTRY	1,468,722	1,349,853	8.8%	100.0%	100.0%
GARMENT PRODUCTION	27,714	22,489	23.0%	1.9%	1.7%
NUMBER OF PRODUCED PIECES	27,826 THOUS.	15,259 THOUS.	82.0%		

Source: Statistical Committee of the Republic of Armenia

[17] Statistical Committee of the RA - Publications. [online]
[18] State Revenue Committee of the RA: Information, Statistics. [online]
[19] State Revenue Committee of the RA: Information, Statistics. [online]

TABLE 2: CLOTHING PRODUCTION IN ARMENIA IN 2018 AND 2019, BY TYPE OF OUTPUT

CATEGORIES	PRODUCTION IN AMD MILLION	
	2019	2018
OUTERWEAR	12,560	11,538
UNDERWEAR	1,389	172
SPORTSWEAR	63	35
INFANTS WEAR	93	102
SOCKS, HOISERY, OTHER TEXTILES	7,580	6,945
OTHER GARMENTS	6,029	3,696
TOTAL	27,714	22,488

Source: Statistical Committee of the Republic of Armenia

the potential of this industry is to be realised. The key challenges anticipated are outlined below.

- **Lack of qualified industrial patternmakers, designers, production managers, and sewing operators** to address the growing demand in the light industry to fulfil large order volumes (prior to COVID-19)

- **Lack of professional fashion education system** with an up-to-date approach to fashion and design, technically-equipped classes and modern curriculum that could provide systemic fashion education. There is also an insufficient number of self-sustainable training centres for providing practical training courses and upgrading of skills. In general, there is an absence of relevant business approaches and a link between existing educational institutions and textile industry players is virtually non-existent, which has resulted in limited availability of the skilled labour force for the sector's enterprises

- **Need for improved market access**. There is a lack of technological capability that could improve competitiveness in regional and international markets. Additional challenges include higher export costs, lack of knowledge on globally relevant certifications and standards schemes for Armenia's businesses and products, and inadequate control over production quality. Improving all of these factors, combined with strong marketing efforts and closer collaboration between all enterprises in the sector, could lead to

better recognition of the Armenian textile industry capacity and could provide more opportunities to expand in local and international markets

- **Need for effective management and control** of textile factories, especially of larger ones. This would contribute to product diversification, new seasonal collection development and eventually an increase in sales. Control over quality and productivity improvement are key contributors to cost optimisation and higher profitability

- **Lack of required investment in the sector** to expand production processes and product lines and to modernise factories which at present operate with old and inefficient machinery

- **Limited access to raw materials locally** means Armenian companies rely on imports of raw materials. The high transportation costs and relatively long time frames for delivery of those materials may negatively impact timely fulfilment of contracts and product competitiveness in the foreign market

- **Absence of eco-production and recycling.** Currently, the sector operates on a traditional linear economy and there is no adequate approach and relevant culture for 'eco-production' and recycling. The sector lacks investment in recycling processes and facilities in order to reduce textile waste and improve sustainable practices, as well as knowledge and awareness within companies and designers across the textile supply chain

THE ROADMAP FOR ACTION

To obtain first-hand data from key textile industry players in Armenia, a survey was conducted with 17 companies between February-March 2020. The selected group of companies, which employ in aggregate over 5,500 workers, covers a large statistical sample and is highly indicative for the garment production industry in Armenia. The survey included questions on topics such as the total number of employees, gender composition, materials used and sourcing countries, export destinations, production process steps, chemicals used for washing and dyeing, certificates obtained, and training of employees.

Based on this research, a roadmap for action has been developed *(see Fig. 4, overleaf')*, which outlines five key recommendations for the sector with the aim of providing solutions to help boost the socioeconomic role of the Armenian clothing industry, while simultaneously promoting best practice in order to raise the profile and significance of " Made in Armenia".

The roadmap below takes into consideration the different stages of the fashion supply chain, from textile production through to end of useful life of products, creating a good base for a future shift towards a circular economy for the Armenian textile industry.

ROADMAP FOR A MORE SUSTAINABLE ECOSYSTEM FOR
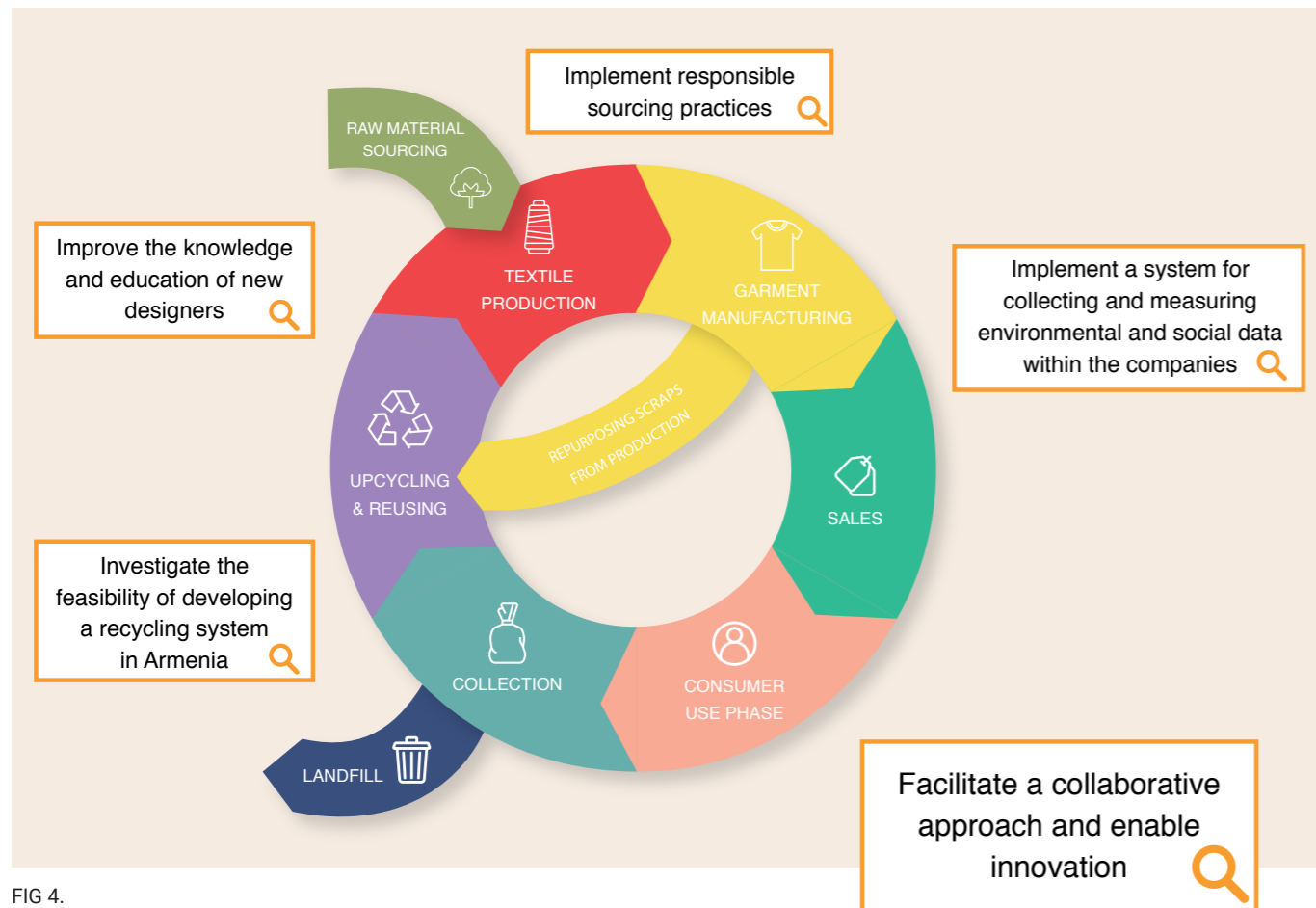THE ARMENIAN FASHION AND TEXTILE INDUSTRY

FIG 4.

The five recommendations identified, which constitute the following sections of this report, are as follows:

01 **Improve the knowledge and education of new designers** to inspire local designers and younger generations to incorporate sustainable practices into all business operations
PAGE 17

02 **Implement responsible sourcing practices** in order to meet international environmental and social standards
PAGE 25

03 Implement a system for **collecting and measuring environmental and social data** within textile and garment production companies
PAGE 39

04 Investigate the feasibility of **developing a recycling system in Armenia**
PAGE 46

05 Develop an industry body that can **facilitate collaboration and enable innovation** within the sector
PAGE 63

19
Improve the Knowledge & Education of New Designers

80% OF A PRODUCTS' environmental impacts are determined at the design phase.[20]

Eco-innovation means developing new products and processes that have a lower environmental impact, but higher customer and business values.[21] In the development of new products or re-creation of those already existing, the design phase plays a pivotal role in re-thinking how we interact with our products, the design intent of a circular system and the actual performance of the system.

The 2009 European Commission (EC) Ecodesign Directive 2009/125/EC defines eco-design as "the integration of environmental aspects into product design with the aim of improving the environmental performance of the product throughout its whole life cycle". Engagement from the EC from such an early date demonstrates the importance, and the business case, for ensuring that the full supply chain, including designers, are educated and empowered to make decisions that will ultimately have a positive effect on both the performance and environmental impact of a product from cradle to grave, from its raw materials provenance to end-of-life behaviours.

[20] 'EC, Eco-Design your Future: How Eco-Design can help the environment by making product smarter (2014)
[21] Oxborrow, L & Brindley, C. (2013) Adoption of eco-advantage by SMEs: emerging opportunities and constraints., European Journal of Innovation Management. European Journal of Innovation Management, 16 (3), pp. 355-375.

Challenges & Opportunities

Indeed, decisions made during the design stage of a product (such as whether to use organic, recycled or unblended materials instead of conventional or blended ones, or whether the product will be made-to-order as required rather than mass produced based on unverified sales projections) can determine its social and environmental impact, including, but not limited to, durability, reparability, reusability and recyclability. In saying this, it is worth noting that while it is possible to design completely circular systems, the actual circularity will be impacted by the users and stakeholders of the actual product. Products that are designed to be recycled for example, may not have the infrastructure available due to market changes or insufficiencies and may, instead, be landfilled or incinerated, which is an example of the current situation in Armenia.

These design and production elements that impact the environmental performance of any product over its lifecycle, are being increasingly recognised by governing bodies such as the EC. For example, as well as defining 'eco-design', the EC's 2009 Ecodesign Directive establishes a framework for setting out the efficiency requirements that energy-related products must fulfil in order to be placed on the EU market. In order to comply with the Directive products must have a Declaration of Conformity; a supporting technical file to show compliance; and display the CE marking, which is an administrative marking that indicates conformity with health, safety, and environmental protection standards for products sold within the European Economic Area. National sanctions for non-compliance are determined individually by each EU Member State - the UK for example will issue a maximum fine as penalty. [22][23] Given that the UK left the EU on 31st January 2020, environmental legislation enforced by the EU is subject for review, however as of yet this remains

pertinent. Although no political instrument currently exists that outlines specific design and durability requirements for textile products on the EU market, in 2019 the EC identified textiles as a key priority area given the circular economy potential offered by them[24]. It should also be noted that in 2009 France introduced an Extended Producer Responsibility scheme, which requires businesses to financially contribute, through taxation on the sale of all products, to funding to support R&D and responsible collection, sorting, and processing of post-consumer textile products. This EPR scheme has been approved at EU level through the European Directive 2018/851, which will then be ratified by European member states, and further demonstrates the changing landscape of the fashion industry that new designers are entering.

As we see regulations becoming increasingly widespread and stringent, brands and organisations are being pushed to consider and anticipate the end-of-life impacts of products that are created and sold in the fashion market. Therefore, it is fundamental that we provide young designers with the proper knowledge and tools to navigate this new way of conceiving products: knowledge and tools that will allow them to perceive sustainability not necessarily as a challenge and a constraint, but an opportunity to explore new ideas and innovate the market.

This knowledge building and skills development can begin at secondary school, expanding through further education and even be reinforced through industry placement opportunities, from internships to government-supported apprenticeship schemes.

If we consider the current situation in Armenia, challenges faced by new designers are mainly related to their limited access to international markets, and consequently also difficulties in accessing sustainability-focused innovations and technologies, whether through attending industry events or through a lack of educational opportunities.

However, as Armenia's textile and apparel manufacturing sector is expected to continue growing as detailed in the previous section of this report, there is room for improving current practices and opportunities both at design and manufacturing level.

In order for this systemic change towards more responsible practices to happen, education and skills building will play a key role. In terms of fashion related education, at present Armenia offers fashion and textiles related courses in a number of educational institutions such as Armenian State Pedagogical University named after Khachatur Abovyan, Yerevan State College of Arts named after P.Terlemezyan, State Academy of Fine Arts of Armenia. Despite their currently antiquated fashion and design curriculums, all of these institutions have the potential to help educate the next generation of designers and makers in relation to environmental and social considerations throughout the fashion supply chain. For students in Armenia wishing to learn about sustainability in fashion however, opportunities are currently limited.

There is a paradoxical opportunity provided by the global COVID-19 pandemic. Although it has had many negative impacts on the global population and economy, it has also made the world more connected than ever before, strengthening global communication. The pandemic has also increased the presence of 'digital fashion', with many fashion shows, exhibitions,

competitions, conferences and events moving online. This presents a great opportunity to educate and inspire young designers on how they can integrate sustainability considerations into their designs, as well as increasing their access to global experts and businesses that could enable them to build more responsible fashion businesses. The pandemic has also prompted a rise in home working – opening up opportunities for online courses that would previously have been held in person. These changes illustrate the potential Armenia now has to democratise sustainability education and reach new audiences with resources and opportunities that were previously out of reach due to geography.

To most effectively capitalise on these opportunities, it would be beneficial to have a country level agreement and plan regarding how best to integrate sustainability into fashion education and skills development in the workplace.

As we are now aware of the significant impact that design can have on all stages of a products' life, a key priority will be to incorporate a lifecycle thinking approach into education for design and fashion, from school to university level. Educational institutions should take a proactive role in providing sustainability and circularity literacy to students that will apply those tools to Armenian businesses once established in the market. It is inarguable that design schools have already started to include sustainability-related topics in their courses, or even to create courses dedicated to sustainability in fashion. In the UK for example, London College of Fashion, opened the Centre for Sustainable Fashion in 2008 to support sustainability initiatives and learning across the College. In the same year they established the MA Fashion and Environment course, now called MA Fashion Futures.

[22] GOV.UK, The Eco-Design for Energy-Related Products Regulations 2010. [online]
[23] Conformance CE Marking Specialists, Ecodesign Directive: Summary.

[24] Nadia Ashraf and Jeske van Seters, "Sewing the pieces together: towards an EU strategy for fair and sustainable textiles", ECDPM paper, 2019. [online]

Recommendations

Central St. Martins offers MA Material Futures (previously called Textile Futures) and MA Biodesign courses, and Chelsea College of Art and Design hosts the Centre for Circular Design, a Research Centre of University of the Arts London (of which all three of the previously mentioned colleges are part). There are also a growing number of sustainability related fashion courses offered in Germany and Scandinavia, as well as the USA; however, sustainability is still not a topic included in worldwide fashion and design schools as part of the standard curriculum.

To develop sustainability education in fashion it will be necessary to come up with an alternative framework of questioning and analysing, because improvements will not happen without challenging the status quo and old ways of thinking, which would risk limiting the potential positive effects of these new actions[25].

We have identified a range of existing educational initiatives from around the world that can offer increased opportunities to designers, both through increasing employability due to enhanced sustainability literacy, and by providing the tools to create and contribute to more positive and responsible businesses.

To begin with, the FDC could evaluate the possibility of building the sustainable design capacity of higher education institutions by offering online educational platforms, in order to ensure Armenia's young designers stay ahead in this evolving market. Additionally, there is an opportunity to promote and widely operate a newly-launched FDC online courses platform, which will be regularly updated with relevant training courses and other activities. Using that platform, emerging and graduate designers could gain industry knowledge, establish connections, gain visibility, and receive training and support through a range of online and physical activities, courses, and events, potentially including an industry-sponsored design competition. This would:

- Unite and empowers the fashion, textile, and design community

- Enable easy networking and establishes connections

- Provide opportunity for collaboration, sponsorship, and awareness

Armenia also has the opportunity to **review the universities and courses offering fashion and textiles learning and identify opportunities to integrate sustainability learning into the existing curriculum.** An accessible way to begin this process is for courses to incorporate a sustainability-focused project each semester or year. A next step would be establishing sustainability requirements in learning criteria – ensuring that all student work is assessed with

sustainability considerations in mind. This would need to be supported by incorporating sustainability topics into the curriculum, where possible offering additional industry support through access to online webinars and events.

As well as in-person education, **online education is an essential area to address** – and one that has the potential to reach wider audiences than university courses typically can. In 2020, as more people were staying home with many experiencing a decrease in available work, Google searches for online courses saw an increase of over 100% worldwide from mid-March to mid-April 2020.[26] Similarly, enrolment for massive open online courses (MOOC) on online platforms Coursera and Udemy skyrocketed in 2020, the former seeing 644% higher enrolment from mid-March to mid-April 2020 compared to the same period in previous year[27] and the latter up over 400% between February and March 2020 compared to 2019.[28] Examples of online platforms that currently offer sustainability focused fashion training include Future Learn, which offers free courses such as 'Fashion and Sustainability: Understanding Luxury in a Changing World' created by University of the Arts London (UAL) and international luxury fashion group Kering, and Fashion Revolution, which offers a range of courses and tools focused on sustainability in fashion. Similarly, UAL's Centre for Sustainable Fashion's online resource tool offers a range of free tools and resources aimed at industry leaders, educators, young designers, and students.

Online education is both cost effective and flexible, ranging from free webinars to short courses and long-distance learning, resulting in industry-recognised qualifications. In addition, the worldwide e-learning market is expected to be worth $325 billion in 2025, compared to $165 billion in 2015, presenting a huge opportunity and business case for having digital learning opportunities in place.[29] Taking this into consideration, FDC could take the lead in the creation

[25] Fletcher, K. and Williams, D. (2013), "Fashion Education in Sustainability in Practice", Research Journal of Textile and Apparel, Vol. 17 No. 2, pp. 81-88. [online]

[26] Carlos Gonzalez De Villaumbrosia, Forbes, The Rise of E-Learning in 2020, Forbes, May 26 2020. [online]
[27] Dhawal Shah, "Highlights from Coursera Partners Conference 2020", Class Central, May 17 2020. [online]

[28] Paul Sawers, "Venture Beat, Udemy: Online course enrolment surges amid lockdowns", Venture Beat, April 30 2020. [online]
[29] Carlos Gonzalez De Villaumbrosia, "The Rise of E-Learning in 2020", Forbes, May 26 2020. [online]

of an online resource platform that is easily accessible to young and emerging designers in Armenia, in partnership with existing organisations that offer online courses focusing on sustainable design. Armenia could work with a translator to ensure learning takes place in both English and Armenian.

While the global pandemic has caused the temporary closure of physical educational spaces such as schools and universities, museums, exhibition and event centres and tradeshows, creating an online resource platform offers the opportunity to ensure accessible learning can still take place online. An online platform can be constantly updated in order to adapt to shifting innovations, trends, and industry requirements, and also provides a platform for manufacturers, academics, sustainability experts, NGOs, refuse companies, and designers to exhibit their work, educate young designers, and establish connections to help strengthen the Armenian fashion and textiles industry.

The 2019 survey carried out with Armenian factories found that several manufacturers in Armenia currently store deadstock and are looking at new ways to reuse their materials scraps in localised supply chains to reduce waste. As new **designers often lack access to the international textiles market, establishing a materials re-use network** in Armenia between designers and manufacturers would enable them to re-utilise waste, by-product, and deadstock materials. This system would have the benefit of minimising waste while increasing access to materials for young designers, as well as building local supply chains that would minimise international transport impacts and ease logistical barriers at a time when international trade and transport is challenging.

Considering that sustainability innovations are increasingly entering the international market, it is also important for Armenian designers to build international connections in order to capitalise on opportunities and remain competitive through events like the Annual Fashion Forum held in Yerevan in 2019, which was a great opportunity for local professionals to exchange

experience and improve their skills.[30] On a similar note, it would be valuable to establish a national young designers awards and competitions in order to provide designers with a platform to exhibit their work, increasing the awareness of young designers and promoting sustainability focused design. These competitions could be open to participation from designers in other countries, particularly countries with which Armenia would like to build trade relations such as Georgia, in order to strengthen relationships and develop potential commercial partnerships.

textile arts center

New York-based **Textile Arts Centre** is running textile-focused educational workshops. Although this case study is mostly aimed at school children, the idea has great potential for young Armenian designers through experience and skill sharing, networking, and education. It can also increase awareness for manufacturers and producers if they engage with courses or lessons.

FUTURE FABRICS EXPO

Tradeshows such as the **Future Fabrics Expo** are a great starting point for young designers. They can see innovative reduced-impact materials, learn about sourcing, establish contacts, and take part in seminars and discussions on a range of topics. Of course, during the global pandemic this is not feasible, but investing in textile fairs and trade shows would be a good idea for the future post-COVID-19. Future Fabrics Expo also has an online resource section where viewers can learn about certifications, initiatives, and case studies.

SWAROVSKI

Since its creation, the **Swarovski Upcycled Crystal Programme** has donated over 2 million upcycled (unused or reused) crystals to students, designers, and stage and screen projects including Kévin Germanier, E.L.V Denim, and Viktor & Rolf.

Fabric Swatch

Fabric Swatch is a UK-based company that collects, sorts, and redistributes textile waste. It collects scrap and deadstock fabrics from designers, manufacturers, and fashion houses and gives the fabrics to sewing classes, small businesses, and schools.

CFDA

CFDA Fashion Awards, which features the American Emerging Designer of the Year award, honours the best and brightest in American design awarding top fashion creatives in American womenswear, menswear, accessories and emerging talent, along with global design.

GRADUATE FASHION WEEK

Graduate Fashion Foundation has supported next generation designers for 29 years and offers new designers an extensive range of support post-graduation. Its services include the GFF awards, GFF News, and GFF Advice.

CNMI GREEN CARPET TALENT COMPETITION

The CNMI x Eco-Age **Green Carpet Talent Competition** brings together global emerging designers to showcase their sustainability-focused creations to a panel of expert judges. The high-profile competition enables finalists and semi-finalists to connect, collaborate, inspire, and boost their industry visibility.

NEW. DESIGNERS

New Designers is one of the UK's leading graduate design shows, and is a key event for young and emerging designers. It encompasses all areas of design including fashion and textiles. It is an established platform that enables participants to connect, discover, and engage in dialogue with other designers. It is also used by key industry players to discover new talent.

LVMH PRIZE ★

The **LVMH Prize** for young fashion designers supports and honours young fashion designers around the world, and is open to international designers who have produced at least two collections and who are under 40 years old. Every year, a young designer and three graduates from fashion schools can claim the prize.

[30] Asbarez article "Fashion Forum Yerevan Opens with the 'Heritage' Fashion Show". June 27 2019. [online]
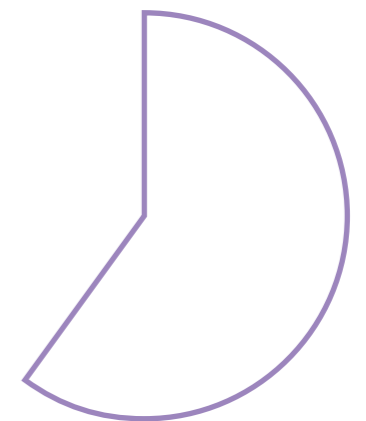
27

Implement Responsible Sourcing Practices

OVER 70%

of sourcing executives from fashion retailers and brands in North America and Western Europe see closer partnerships with suppliers following the pandemic.

AND OVER 60%

of these same sourcing executives believe that sustainable materials will become mainstream.[31]

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[31] McKinsey fashion sourcing survey in 2020 of 116 sourcing executives of fashion retailers and brands. Source: Achim Berg, "Time for Change: how to use the crisis to make fashion sourcing more agile and sustainable", McKinsey. May 6 2020. [online]

It is proven that the fashion industry's irresponsible sourcing practices can pose a number of threats to the environment and to human rights. These threats are increasingly exposed by media organisations and pushed to the forefront of the global public conscience. Indeed, according to a research carried out by McKinsey, consumers expectations of brands are dominated by social and environmental responsibilities. Its survey, conducted in April 2020 across more than 2,000 UK and German consumers, revealed that 55% of respondents would like brands to care for the health of employees, 38% would like them to contribute to helping low-paid workers in factories in Asia and 38% would like brands to reduce the negative impact on the environment.

Thus, under such pressure from consumers and the public, it is becoming common practice for brands to ask the suppliers with whom they collaborate to sign a Code of Conduct, which is a document that outlines the brand's values alongside non-negotiable terms and conditions that the suppliers must respect. Examples of some mandatory conditions that might be found in a brand Code of Conduct include the refusal to accept cotton produced in high social risk countries such as Uzbekistan and Turkmenistan, or forbidding the purchase of products made from animal-based fibres where mulesing has occurred. From a human rights perspective, many brands also align their Codes of Conduct to the Ethical Trading Initiative (ETI) base code, which sets out nine labour standards to adhere to, such as that employment is freely chosen, and child labour is prohibited. These standards are based on the internationally recognised International Labour Organisation (ILO) conventions.[32]

In line with this trend of improving current sourcing practices, buyers are placing increased emphasis on sustainable materials. In a 2019 survey of 64 global sourcing executives responsible for over USD 100 billion, it was identified that **sustainable materials is a top priority for sourcing executives** *(see Fig. 6)*, and that 55% of companies aim to source at least half of their products with sustainable materials by 2025.[33] This means that, in the future, **brands will look for manufacturers that are able to create products using materials that meet specific environmental and/or social quality and assurance standards**.

Key areas sourcing executives plan to work on

"What are the 3 key sustainable apparel sourcing topics at the top of your agenda for the next 5 years?"
Top 8 topics aggregated, n = 64

1 — Sustainable materials
2 — Transparency and traceability
3 — Supplier relationships
4 — Purchasing practices
5 — Ecological footprint
6 — Circular economy
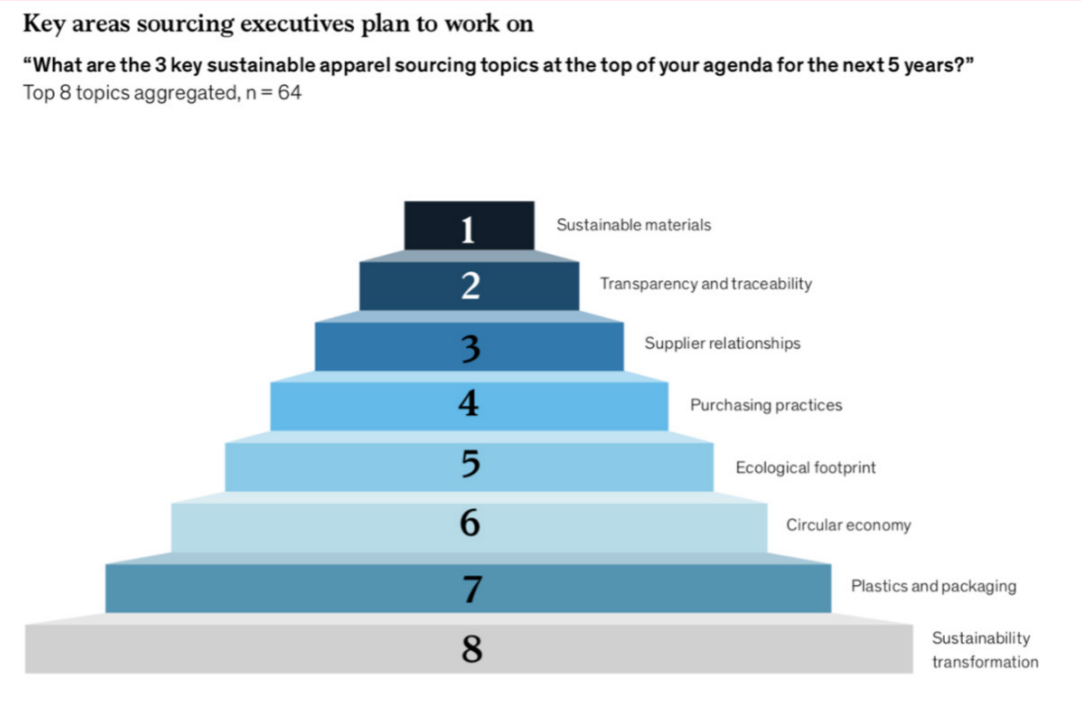7 — Plastics and packaging
8 — Sustainability transformation

FIG 6.

According to 2017 research into the textile and apparel industry in Armenia, one of the key challenges found was the lack of full compliance with international standards that assure product quality.[34] Given the geographic proximity of Armenia to Europe and the fact that its textile and garment industry has a large workforce and development potential[35], improved social and environmental practices could present a great opportunity for Armenia to increase production volumes and establish the "Made in Armenia" trademark as a trusted quality assurance label, in line with growth plans established prior to the outbreak of COVID-19. This would allow the industry to capitalise on the opportunity to increase collaboration with European-based brands, and to stay on top of the increasingly stringent standards of the global fashion industry.

Consumer expectations of brands are dominated by social and environmental responsibilities.

Actions for fashion brands to help society deal with impact of COVID-19 crisis, % of respondents selecting action as top 2 priority (n = 2,004)

| Care for health of employees **55** | Contribute to helping low-paid workers in factories in Asia **38** | Reduce negative impact on environment **38** | Enable safe and hygienic in-store shopping **33** | Reduce prices and give discounts **20** | Ensure product availability on e-commerce channel **11** |

FIG 5.
Source: McKinsey, Survey: Consumer sentiment on sustainability in fashion

[32] ETI, The ETI Base Code. [online]
[33] McKinsey, Fashions New Must have Sustainable Sourcing at Scale, 2019. [online]

[34] Greta M, Lewandowski K, Mamikonyan G. Textile and Apparel Industry in Armenia: The Former Potential and the Perspectives for Future Development of the Industry. FIBRES & TEXTILES in Eastern Europe 2017; 25, 2(122): 10-15. DOI: 10.5604/12303666.1232873

[35] Greta M, Lewandowski K, Mamikonyan G. Textile and Apparel Industry in Armenia: The Former Potential and the Perspectives for Future Development of the Industry. FIBRES & TEXTILES in Eastern Europe 2017; 25, 2(122): 10-15. DOI: 10.5604/12303666.1232873

Challenges & Opportunities

SOURCING COTTON

In the 2019 survey carried out by Eco-Age and FDC, which aimed to gain overview of the current sourcing practices in the Armenian textile and garment industry, respondents were asked about their sourcing and manufacturing practices, specifically which types of fibres they use and which countries they source their raw materials, yarn and fabric from. **94% of respondents stated that cotton is used in production, followed by man-made cellulosic fibres and synthetics,** such as acrylic and polyester *(see Fig. 7)*.

One major risk identified for the Armenian textile and garment industry's cotton sourcing practices is that many companies might currently be sourcing this material from countries that are at high risk in terms of human rights breaches. Findings from the 2019 survey conducted by Eco-Age and FDC show that some Armenian manufacturers source cotton from Uzbekistan and Turkmenistan *(see Fig. 8)*, which are countries that have shown overwhelming evidence of state-orchestrated forced labour being used in this sector, where many are forced to pick cotton and are exposed to chemicals, unsanitary housing, and lack of safe drinking water (Cotton Campaign.org). As a result of this, action is being taken both at country and brand level to avoid sourcing from Uzbekistan or Turkmenistan (or both), across regions such as North America and Europe. Where Turkmenistan is concerned, in 2018, the U.S. Customs and Border Protection (CBP) filed a detention order banning all U.S. imports of cotton, or products made with cotton from this country after discovering the presence of state-orchestrated forced labour.[36] At brand level, and where Uzbekistan is concerned, over 300 brands have signed the Responsible Sourcing Network's Cotton Pledge,

promising to eliminate Uzbek cotton from their supply chains.[37] Similar action has been taken by many large North American and European brands such as ASOS and PVH (just to name a few), which have adopted policies banning cotton sourced from Uzbekistan, Turkmenistan, or both.

Aside from the human rights threats posed by directly sourcing from these aforementioned countries, there is also a potential risk when sourcing cotton from countries that neighbour Uzbekistan and Turkmenistan. This is due to the fact that cotton from these countries often enters the cotton supply chains of neighbouring countries, such as Turkey. For example, in 2018, two thirds of cotton exports from Turkmenistan went to Turkey[38], a country listed as a sourcing destination by 59% of the respondents of the survey conducted by Eco-Age and FDC *(see Fig. 8)*. However, it is worth noting that following the pandemic, war and recently introduced trade ban over Turkish goods, it is likely that Armenian producers will cease sourcing their raw material supplies from Turkey, therefore mitigating the risk of Turkmenistan cotton entering their cotton supply through this neighbouring country.

In addition to the potential social impacts related to producing cotton, its cultivation can sometimes result in large scale environmental impacts, such as soil erosion and high-water use. Furthermore, **conventional cotton uses about 16% of the world's insecticides and 7% of pesticides**.[39] In response to this, and in order to address some of these impacts, many farmers are now producing organic cotton, which is cotton that is certified to organic agricultural standards and does not allow the use of toxic chemicals or Genetically Modified Organisms (GMOs).

MOST COMMON TYPES OF MATERIALS USED BY ARMENIAN PRODUCERS*

NUMBER OF COMPANIES USING THE MATERIAL

FIG 7.

TOP SOURCING COUNTRIES FOR ARMENIAN MANUFACTURERS, BY MATERIAL TYPE*
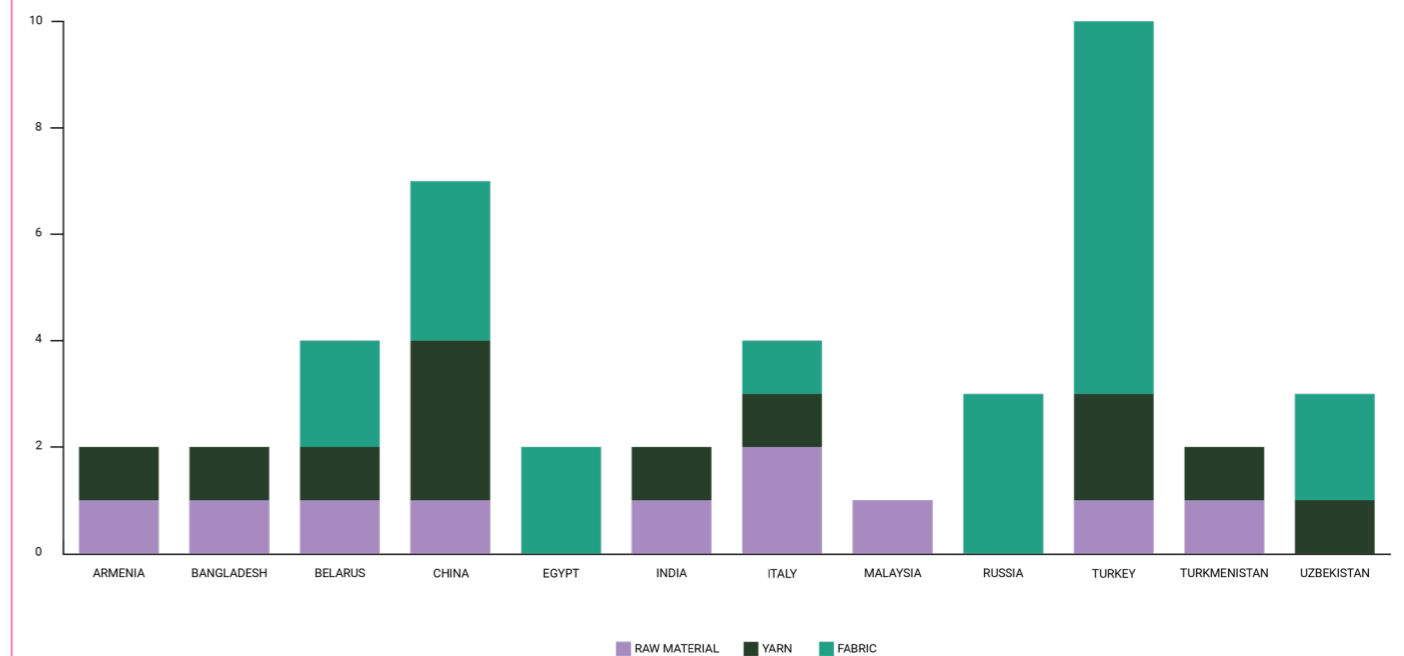
RAW MATERIAL   YARN   FABRIC

FIG 8.

* Based on data from the 2019 Eco-Age x FDC survey

Research shows that organic cotton is being used more and more widely, indeed a 2020 EDITED analysis found that arrivals in organic cotton are up 238% since 2018 and 97% YOY, whilst investment in organic cotton activewear has grown 18% YoY.[40] As none of the respondents of the 2019 Eco-Age and FDC survey of Armenian factories mentioned sourcing organic cotton, there is the opportunity to investigate this in order to target these shops that are demanding organic cotton over conventional cotton. A best practice example of organic cotton is GOTS certified cotton, which is a certification that verifies full traceability of the cotton and assesses not only the organic content of a product, but also other environmental and social criteria.

CERTIFIED FACILITIES ON THE RISE: A SPOTLIGHT ON GOTS

Facilities are increasingly recognising the importance of certification in order to compete within the global market. For example, in 2018, the number of GOTS certified facilities showed an increase of 14.6% on 2019, from 5,024 to 5,760 facilities. Certified facilities are now located in 64 countries around the globe, and countries and regions with the largest growth in percentage in GOTS certification (in 2018) are: Bangladesh (+29%), North America (+25%), Pakistan (+23%) and South Korea (+23%). The top 10 countries in terms of total number of certified facilities are: India (1973), Bangladesh (689), Turkey (519), Germany (500), Italy (340), China (301), Pakistan (238), Portugal (215), USA (127), and South Korea (85).[41] For Armenia to compete it should also consider looking for such certifications for its facilities.

CASE STUDY
EXAMPLES OF BRAND MATERIALS SOURCING POLICIES

asos
Policy: Raw Cotton Sourcing

Applicable: Textiles
Applicable to: All categories
Country: All
Date issued: September 2017

Policy

ASOS does not support the use of cotton from Uzbekistan or Turkmenistan in our textile products.

From October 2017 onwards ASOS will require suppliers to identify the source of raw cotton used in ASOS textiles products and document this.

CR SUPPLY CHAIN GUIDELINES | OTHER POLICIES

UZBEKISTAN AND TURKMENTISAN COTTON POLICY

WHAT DOES IT MEAN?

In September 2011, PVH made an ongoing public commitment through the Responsible Sourcing Network, to not knowingly source cotton from Uzbekistan in effort to stop the use of child labor and forced labor in the country's cotton fields. PVH requires that its suppliers (mills and factories) also adhere to this commitment by not using Uzbekistan cotton in any product produced for PVH brands – Calvin Klein, Tommy Hilfiger, Van Heusen, IZOD, Arrow, Speedo, Olga and Warner's. PVH along with more than 60 U. S. and European brands have committed to maintain the pledge until the elimination of these practices in the cotton industry of Uzbekistan is verified by the International Labour Organization.

THE PVH PLEDGE

WE, THE UNDERSIGNED COMPANIES ARE WORKING TO ENSURE THAT FORCED CHILD AND

SOURCING FROM CHINA

In the 2019 survey on Armenian sourcing and manufacturing practices carried out by Eco-Age and FDC, **41% of respondents claimed to source raw materials, yarn or fabric from China** (see Fig. 9) - a country known to have poor labour standards and a high prevalence of forced labour, with recent evidence highlighting that **half a million minorities are coerced into cotton picking in the Xinjiang province each year.**[42] Due to these sorts of risks increasingly coming to light, many European brands are trying to gain more control over value chains to ensure that labour conditions such as health & safety, as well as environmental standards, are respected by all of the suppliers collaborated with. As part of this, brands might look to carry out an analysis of their sourcing countries and the risks associated with these countries, looking to reduce materials and products that originate from high-risk locations.

COMPLIANCE WITH THE EUROPEAN MARKET'S LEGAL REQUIREMENTS

In order to sell on the European apparel market, there are a number of legal requirements that exporting countries must comply with. As Armenia wishes to investigate opportunities to export textiles and garments to the European market, it could be useful for Armenian manufactures to become familiar with these. For example, in the 2019 Eco-Age FDC survey, respondents were asked whether they had established voluntary policies on the use of restricted substances or were members of any chemical coalitions such as ZDHC (Zero Discharge of Hazardous Chemicals). None of the respondents reported having voluntary chemical regulation in place and while this could be due to the fact that the Armenian respondents surveyed do not treat and dye material, it is still worth ensuring compliance with European chemical compliance and other key regulations. The key legal requirements for
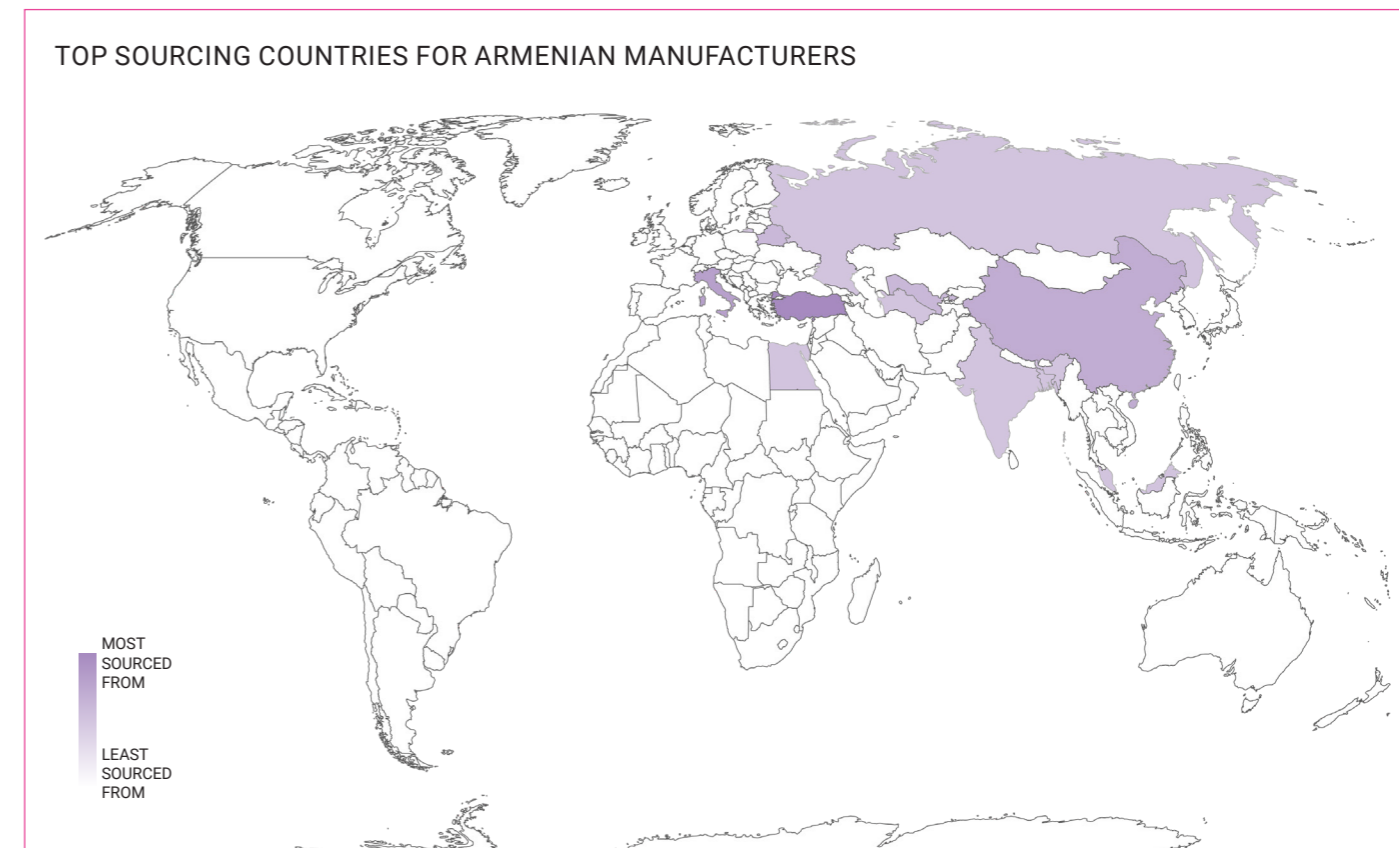

TOP SOURCING COUNTRIES FOR ARMENIAN MANUFACTURERS

MOST SOURCED FROM

LEAST SOURCED FROM

FIG 9. * Based on data from the 2019 Eco-Age x FDC survey

[40] EDITED, The Sustainability EDIT 2020: Retail Analysis. [online]
[41] Global Organic Textile Standard (GOTS) Press Release: "New Figures show continued significant growth", 7 March 2019. [online]

[42] John Sudworth, "China's Tainted Cotton", BCC. January 15 2021. [online]

apparel to enter the European market, according to the latest information from the CBI Ministry of Foreign Affairs, are as follows[43]:

- **REACH** is an EU regulation that restricts the use of a large selection of chemicals in textiles and leather, with the most commonly used restricted chemicals being Azo dyes for dyestuffs, perfluorooctanoic sulfonic acid for waterproofing, and dioctlytin, tributyltin for biocides and preservatives

  - In addition to REACH, some EU countries such as Austria, Finland, Germany, Norway and Netherlands have set additional national regulations on chemicals

  - Many brands and retailers have also formulated **Restricted Substances Lists (RSLs), which any manufacturers doing business with these brands with must comply with.** These are stricter than REACH and in line with the Zero Discharge of Hazardous (ZDHC) Chemicals guidelines

- All items must comply with **The EU's General Product Safety Directive (GPSD) 2001/95/EC**, which ensures that only safe products are sold on the market and that consumers are informed of any risks associated with products

- **The Biocidal Product Regulations (BPR)** must be complied with if you add biocides to textiles in order to protect humans and animals against harmful organisms such as pests or bacteria

- In accordance with the **EU Regulation 1007/2001** on labelling it is compulsory to specify the material content of every item of apparel exported to the EU. Made in' or labelling care instructions are not yet legally required in the EU but are best practice as customers expect it. The EU Trade Helpdesk provides useful information on which apparel items need to be labelled and how to do it,

and the GINETEX website provides examples of common care labelling practices in Europe

- **EU wildlife regulatory measures EC 338/97** restricts the use of endangered or exotic species of animals and plants in products. This regulation is based on the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

LABOUR PRACTICES IN ARMENIAN FACTORIES

There is evidence to show that gender-based violence and other human rights abuses exist in female-dominated sectors such as the garment sector. In factories where some major brands source clothes from in countries such as China and Bangladesh, women are often deprived of maternity leave, childcare and safe travel to work.[44] Findings from the 2019 survey of Armenian sourcing and manufacturing practices, conducted by Eco-Age and FDC, show that 90% of workers in the Armenian textile and garment industry are female, and according to a 2017 report, this has been true of the industry for a number of years.[45] According to the 2019 US Department of State report on human rights for Armenia, there is reason to believe that sexual harassment of women in the workplace is possible in Armenia, which fits with the evidence that gender-based violence is common in female-dominated sectors.[46]

There is an opportunity for Armenia to refute such claims by highlighting its positive labour practices by undertaking SEDEX and SA 8000 social audits of factories or encouraging factories to sign up to industry initiatives such as Ethical Trading Initiative (ETI) / Fair Wear Foundation (FWF) / Fair Labour Foundation (FLF) and adopt anti-discrimination and human rights policies. Indeed, it is becoming a common practice for European brands to ask suppliers for social audits (such as BSCI or SMETA) and/or a social certification (such as SA 8000).[47]

SUSTAINABILITY IS ON THE AGENDA FOR THE TOP EU BRANDS AND RETAILERS

Under pressure from end consumers, politics and media, many buyers in Europe are increasing their demands from suppliers. In recent years, a number of brands and retailers have adopted sustainability strategies that involve bold public pledges on sustainable materials and strict requirements for their suppliers. Figure 10 shows that over **80% of some of the leading retail and brand importers for the top 6 EU import markets in 2020 (Germany, France, UK*, Spain, Netherlands and Italy) have published code of conducts with social and/or environmental requirements and/or request specific information from brands or suppliers**. Please note that the brands and retailers listed below are leading market players according to an M-Brain analysis based on data from Eurostat. Whilst they indicate that many of the leading market players for the top EU import markets have environmental and/or social requirements in place for suppliers, they are not necessarily examples of best practice brands and retailers in terms of sustainability.

LEADING EU FASHION MARKET PLAYERS HAVE SUPPLIER REQUIREMENTS IN PLACE

	GERMANY	FRANCE	UK	SPAIN	NETHERLANDS	ITALY
5 LEADING BRANDS, BY COUNTRY	HUGO BOSS	LOUIS VUITTON (LVMH)	ALEXANDER MCQUEEN (KERING)	LOEWE (LVMH)	SCOTCH & SODA	ARMANI
	ADIDAS	CHANEL	BURBERRY	DELPOZO	LAUNDRY INDUSTRY	PRADA
	ESCADA	DIOR (LVMH)	STELLA MCARTNEY	ADOLFO DOMINGUEZ	MEXX	ZEGNA GROUP
	TOM TAILOR	GIVENCHY (LVMH)	TEMPERLEY LONDON	DESIGUAL	VIKTOR & ROLF	D&G
	JIL SANDER	YSL (KERING)	VIVIENNE WESTWOOD	BIMBA Y LOLA	-	VALENTINO
2 LEADING RETAILERS, BY COUNTRY	ZALANDO	GALARIES LAFAYETTE	ASOS	EL CORTE INGLES GROUP	ZALANDO	YOOX NET A PORTER
	C&A	C&A	M&S	MANGO	G STAR	BENETTON

FIG 10.

*Data source for leading market players (brands and retailers): CBI Ministry of Foreign Affairs, What is the demand for apparel on the European market?: M-Brain Analysis based on Eurostat data, 2020. [online]

SUPPLIER REQUIREMENTS**

- SUPPLIER CODE OF CONDUCT IN PLACE
- HAVE SET KPIS / MINIMUM SOURCING CRITERIA FOR SUPPLIERS
- CONDUCT SOCIAL AND/OR ENVIRONMENTAL AUDITS OF SUPPLIERS

[43] CBI, "What are the requirements for apparel to enter the European Market?", December 2020. [online]
[44] Clean-Clothes-Campaign.com, 'Gender Discrimination'. [online]
[45] Greta M, Lewandowski K, Mamikonyan G. Textile and Apparel Industry in Armenia: The Former Potential and the Perspectives for Future Development

of the Industry. FIBRES & TEXTILES in Eastern Europe 2017; 25, 2(122): 10-15. DOI: 10.5604/12303666.1232873
[46] S Department of State, 2019 Country Reports on Human Rights Practices: Armenia. [online]
[47] CBI, 'Exporting sustainable apparel to Europe'. 27 February 2019. [online]

*Please note that the UK has been included in the list of top EU apparel markets here; however, as of January 31st 2020, the UK left the EU

**Brand supplier requirement analysis based on publicly available policies and information online. See Appendix 1 for list of sources used for each brand.

According to the Confederation of British Industry (CBI), within the next three years, **suppliers should expect that buyers will require them to**:

- **Trace the origins of materials**[48]**;** as consumers demand increased visibility over the origins of materials, brands will expect visibility over tier 2 and 3 suppliers as well meaning that suppliers will need to trace their suppliers

- **Reduce carbon footprints;** for example, by adopting energy reduction strategies, offsetting emissions, and going public with carbon neutrality commitments

- **Keep chemical use to a minimum;** as mentioned in the section on European legal requirements, many brands and retailers have formulated RSLs that outline restrictions on chemicals and are often stricter than REACH legislation. These RSLs must be complied with to do business with these brands and therefore suppliers will be expected to be sure they are stricter regarding chemical use

Here are two examples of garment manufacturers outside of the EU, that have successfully implemented some or all of these practices and are exporting to the EU.

**CASE STUDY
BANGLADESH**

DENIM EXPERT LTD.
Garment & Washing Industry

Denim Expert Limited in Bangladesh is certified to the following standards; OHSAS 18001, GOTS, OKEOTEX, Sedex and WRAP (Worldwide Responsible Accredited Production), and has also signed up to the Amfori and ACCORD initiatives. It supplies garments to buyers in the UK, Ireland, Germany, Spain, the Netherlands and Turkey.

**CASE STUDY
CHINA**

晶苑國際集團有限公司
CRYSTAL INTERNATIONAL GROUP LIMITED

Crystal Group from China is a CSR-driven apparel maker. Its quality management system governs every stage of the manufacturing process from purchase order placing, to before-delivery inspection, and to laboratory test. It operates certified in-house textile testing laboratories globally that conduct performance tests on its raw materials, semi-finished products and final products. It operates with RSLs, wastewater monitoring and has an EMS aligned to ISO 14001.

Recommendations

In order to sell in the EU fashion market and operate in line with the current requests of the market such as brand suppliers' codes of conduct, it is recommended that Armenian companies take the steps outlined below. Armenian companies could be given detailed training on each of the steps below, in order to support them in decision-making.

1. INVESTIGATE OPPORTUNITIES FOR SWITCHING TO LOWER IMPACT MATERIALS

POLYESTER, RELEVANT CERTIFICATIONS	
	GRS (Global Recycled Standard) is an international, voluntary, full product standard that sets requirements for third-party certification of recycled input, chain of custody, social and environmental practices, and chemical restrictions.
	RCS 100 (Recycled Claim Standard) is an international, voluntary standard that certifies recycled content and chain of custody.
	Bluesign® is a certification that has a core focus of resources, people and the environment. They work with chemical suppliers, textile manufacturers and brands, helping them to increase the sustainability performance of products and to the minimise risks posed to people and the environment from chemical use.
	Oeko-Tex®'s Standard 100 is a global independent testing and certification system for raw, semi-finished and finished textile products at all levels of processing.

POLYESTER, RELEVANT INITIATIVES AND / OR BEST PRACTICE	
	Newlife™, developed by Sinterama is a high performance recycled polyester yarn, made from post-consumption plastic bottles collected in northern Italy.
	Repreve®, developed by Unifi, is a yarn processed from recycled plastic bottles and post-industrial waste from around the world.
	Bionic Yarn is a combination of recycling and textile technologies that uses recycled plastic as the core of its yarn. The high-quality yarn can be used across a number of applications.

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48 CBI, What is the demand for apparel on the European market, 2020. [online]

COTTON, RELEVANT CERTIFICATIONS

Regenerative Organic Certified™ is a revolutionary new certification for food, textiles, and personal care ingredients. ROC™ farms and products meet the highest standards in the world for soil health, animal welfare, and farmworker fairness.

GOTS (Global Organic Textile Standard) was developed by leading standard setters to define world-wide recognised requirements for organic textiles. From the harvesting of the raw materials, environmentally and socially responsible manufacturing to labelling, textiles certified to GOTS provide a credible assurance to the consumer.

OCS (Organic Content Standard) is a standard developed by Textile Exchange for tracking and verifying the content of organically grown materials in a final product.

GRS (Global Recycled Standard) is an international, voluntary, full product standard that sets requirements for third-party certification of recycled input, chain of custody, social and environmental practices, and chemical restrictions.

Faitrade works with the small-scale cotton farmers in Asia and Africa and helps build stronger farmer-owned organisations provide economic benefits. The standard provides economic benefits through a guaranteed Fairtrade Minimum Price and additional Fairtrade Premium for seed cotton farmers. Although socially focused, it also covers environmental criteria too.

COTTON, RELEVANT INITIATIVES AND / OR BEST PRACTICE

BCI (Better Cotton Initiative) works with a diverse range of stakeholders across the cotton sector, to promote measurable and continuing improvements for the environment, farming communities and the economies of cotton-producing areas. It aims to reduce the environmental impact of cotton production as well as Improve livelihoods and economic development in cotton producing areas.

CMiA (Cotton Made in Africa) is an initiative of the Aid by Trade Foundation (AbTF) that helps African smallholder cotton farmers to improve their living conditions. Growers must meet minimum environmental and social requirements for their cotton to qualify as CmiA.

Evrnu® NuCycl™ regenerative fiber technologies enable new products to be made from discarded consumer clothing. Evrnu works with brands such as Adidas and Stella McCartney.

Re:newcell, is a textile-to-textile recycling company based in Sweden, whose technology dissolves used cotton and other natural fibers into a new, biodegradable raw material, re:newcell pulp.

2. CONSIDER WORKING TOWARDS CERTIFYING THE FACILITIES

Armenian companies could potentially consider highlighting their positive environmental and social practices through the adoption of social and environmental management systems, and/or specific certifications.

SOCIAL ASPECTS

- **Social audits: SMETA, BSCI**

- **Social certifications: SA 8000**: provides a holistic framework allowing organisations of all types, in any industry, and in any country to demonstrate their dedication to the fair treatment of workers.

The SA8000 Standard is based on internationally recognised standards of decent work, including the Universal Declaration of Human Rights, ILO conventions, and national laws. SA8000 applies a management-systems approach to social performance and emphasises continual improvement—not checklist-style auditing

- **Health and safety management system: ISO 45001:** is an ISO standard for management systems of occupational health and safety (OH&S), published in March 2018. The goal of ISO 45001 is the reduction of occupational injuries and diseases, including promoting and protecting physical and mental health

- **WRAP:** is the world's largest independent certification program focused on the apparel, footwear, and sewn products sectors. It certifies production facilities against WRAP's 12 Principles which focus on social aspects

ENVIRONMENTAL ASPECTS

- **ISO 140001 Environmental Management:** exists to help organizations minimise how their operations negatively affect the environment; comply with applicable laws, regulations, and other environmentally-oriented requirements. ISO 14001 maps out a framework that a company or organisation can follow to set up an effective environmental management system

- **ISO 50001 Energy Management System:** provides a practical way to improve energy use and makes it easier for organisations to integrate energy management into their overall efforts to improve quality and environmental management

BOTH SOCIAL AND ENVIRONMENTAL ASPECTS:

- **B-Corp:** Certified B Corporations balance profit and purpose to accelerate a global culture shift to redefine success in business. Certification is a three-step process that involves assessment, comparison and identifying areas for improvement

3. ADOPT STRICTER CHEMICAL GUIDELINES AND TESTING

REACH - Armenian companies could consider aligning to REACH and adopting stricter chemical regulations considering European brands are adopting strict chemical regulations.

RELEVANT INITIATIVES AND / OR BEST PRACTICE

Oeko-Tex®'s Standard 100 is a global independent testing and certification system for raw, semi-finished and finished textile products at all levels of processing. Materials that hold the Oeko-Tex® Standard 100 certification are verified to be free from residual chemicals that could negatively impact the end user.

Bluesign® is a system that provides reduced-impact solutions for textile processing and manufacturing to brands and industries. The strict Bluesign® criteria states that the manufacturers and brands are required to act responsibly and sustainably regarding people, the environment, and resources. A Bluesign® certified product is offered by brands that have committed to the Bluesign® system. A Bluesign® product consists of at least 90% Bluesign® approved textiles and 30% Bluesign® approved components.
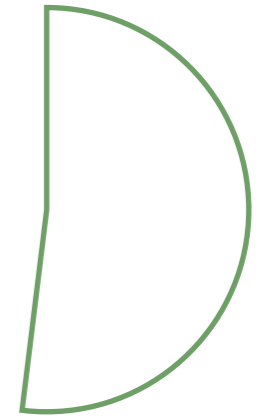
GreenScreen Certified™ is a certification standard with the aim of promoting the use of inherently safer chemicals across the textile industry; the certification is mainly for the textile finishing.

The Zero Discharge of Hazardous Chemicals (ZDHC) is a programme designed to eliminate hazardous chemicals from the fashion industry. Brand participants commit to adhering to a Restricted Substances List (RSL) and report wastewater testing results. Currently, there are 166 contributors: 30 brands, 114 value chain affiliates, and 22 associates.
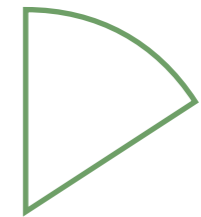
41

Implement a System for Collecting & Measuring Data

52% OF THE LARGEST FASHION GLOBAL BRANDS
and retailers that were assessed for the Fashion Transparency Index 2020 published a supplier policy on energy use and carbon emissions in 2020.

16% OF THESE
published the total carbon emissions produced within their supply chains.[49]

[49] Fashion Revolution, Fashion Transparency Index 2020: survey of 250 large global brands and retailers. [online]

These figures highlight that brands are increasingly expecting their suppliers to measure and reduce energy and emissions, indeed 16% of brands even publish the data. Increasingly, brands and retailers are expected to be transparent when it comes to disclosing information and communicating about their processes and operations. Across the supply chain, more and more businesses are disclosing environmental and social performance data from their supply chains. Some examples of information that is most often collected by brands is listed below.

ENVIRONMENTAL DATA:

- Types and quantities of materials used

- Types and quantities of packaging used

- Annual water use in production, or in direct operations

- Annual energy consumption in production, or in direct operations

- Chemicals used in manufacturing processes

- Scope 1, 2 and 3 emissions

SOCIAL DATA:

- Policies (e.g. Health and Safety Policy, Code of Ethics)

- Employee data i**ncluding number of employees and diversity (e.g. gender, race, religion, age) by level of employment (e.g. director, manager junior)**

- Wage levels, sometimes including whether a living wage is paid

- Whether a grievance mechanism in place for direct employees and suppliers

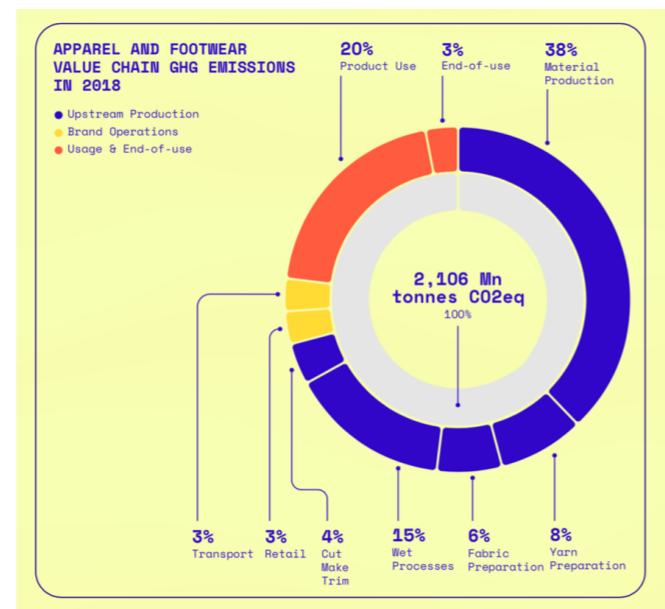Gathering this type of information is beneficial for all companies in the fashion and textiles supply chain as it allows the business, its customers, and potential investors to understand and to an extent benchmark the company's performance in terms of sustainability. It also helps the company measure its impacts and implement impact reduction strategies, for example adopting more energy efficient production methods, or adapting hiring strategies that aim for greater diversity of employees.

WHY DOES THIS MATTER TO ARMENIAN MANUFACTUERES?

Fashion Revolution analysed 250 brands for its Fashion Transparency Index 2020 and found that **brands are increasingly publishing environmental data on their supply chains such as emissions,** which directly impacts the companies in their supply chain. Considering that over 70% of the GHG emissions generated by the apparel and footwear value chain is understood to come from upstream production *(see Fig. 11)*[50], and taking into account the complexity of today's global supply chains, **brands are increasingly bringing their suppliers on this journey, requesting data from suppliers beyond Tier 1.** European brand Acne Studios, for example, has made a public commitment

FIG 11.

Apparel and Footwear Value Chain GHG Emissions in 2019.
Source: McKinsey, Fashion on Climate, 2020

to expand its carbon footprint calculation to include emissions from the production stages of its supply chain, which requires close collaboration.[51]

In addition, and especially following the COVID-19 pandemic when the plight of many people working across fashion supply chains was highlighted around the world, brands are under more scrutiny over human rights management in the supply chain. This means social audits are likely to increase and more data will be gathered on social topics such as fair wages and working hours.[52]

In Armenia, there are many manufacturing companies that might be required to assess their environmental and social performance in order to increase collaboration with European brands. Implementing a data collection and measurement process can be time and resource intensive at the outset, but it is essential for a company to understand and create a baseline of its performance, and to set targets for improvement.

In the 2019 survey of 17 Armenian manufacturers carried out by Eco-Age and FDC, 90% of respondents were able to provide data on the following topics:

- Key materials sourced

- Countries sourced from

- Tonnes of waste disposed of per year

- Annual energy consumption

- Number of female and male employees

However, few factories were able to provide more in-depth detail for analysis. For example, only five companies were able to detail methods of waste disposal, and not all companies could provide a breakdown of the fibre composition of their waste. Considering increasing demand and consumer-business attention towards the disclosure of environmental and social data, and in order to increase collaboration with brands operating in the European market, Armenian factories are advised to develop comprehensive data collection systems to measure and monitor impacts and targets across business practices. Data at a more granular level, especially with regards to waste, will also help ensure that systems developed to manage production responsibly are based on accurate and detailed data.

[50] McKinsey & Business of Fashion, Fashion on Climate, 2020. [online]

[51] Acne Studios, Sustainability Report 2019. [online]
[52] Fashion Revolution, Fashion Transparency Index 2020. [online]

Challenges & Opportunities

From a business perspective, collecting and measuring environmental and social data could offer a number of opportunities, while also futureproofing against increasing brand demands and changing legislation. Some potential business benefits are:

- **Risk reduction:** Regulations on emissions are expected to become more stringent. Several of the world's biggest economies are now planning much deeper cuts in emissions under plans to reach net zero emissions by 2050. The European Union, Japan and the Republic of Korea, together with more than 110 other countries, have pledged carbon neutrality by 2050; China says it will do so before 2060.[53] In addition, The EU is considering implementing a carbon tariff system no later than 2023.[54] Therefore implementing systems and technologies that reduce energy and resource consumption could offer a strategic business opportunity, as well as mitigate the possibility of being negatively impacted by the changing regulatory landscape

- **Cost reduction:** by identifying areas to increase efficiencies, financial cost savings are possible. For example, by introducing energy efficient production or re-using waste or selling it on can generate added value to the business

- **Collaboration opportunities:** showing a commitment to improving environmental and social performance opens the door to collaboration opportunities with other businesses doing the same, for example by signing up to an industry wide initiative. It can also increase business opportunities by enabling collaboration with brands and businesses that have set stringent social and environmental criteria that must be met in order to work together

- **Quality and trust:** Given that Armenia has a high capability and potential in the garment manufacturing sector, collecting data on social factors could become a way to reliably prove the strong performance of its factories, in order to reinforce the concept of "Made in Armenia" as a label of quality and trust

One major challenge with sustainability-related data is the standardisation and comparability of data. To this end, companies rely on the internationally recognised standards for non-financial disclosure, such as the ones developed by the Global Reporting Initiative.

Below are some examples of KPIs that Armenian producers could consider following, as detailed in the GRI Standards:

Materials (GRI 301)
- Total weight or volume of materials used for production and packaging by:

  - Non-renewable materials used

  - Renewable materials used

- Percentage of recycled input materials used calculated as: total recycled input materials used divided by the total input materials used.

Energy (GRI 302)
- Total fuel consumption within the organisation including fuel types used, by:

  - non-renewable sources *(e.g. methane, natural gas, diesel, etc)*

  - renewable sources *(e.g. biofuels, biomass)*

- Total electricity, heating, cooling and steam consumed

  - it is recommended also to collect data related to the total self-generated electricity, heating, cooling and steam, also specifying the percentage coming from renewable sources

- Total electricity, heating, cooling and steam sold

Water (GRI 303)
- Total water withdrawal by source, if possible *(e.g. surface water, groundwater, seawater)*

- Total water discharge by type of destination, if possible *(e.g. surface water, groundwater, seawater)*

- Total water consumption

In order to implement an effective data collection system that incorporates consistent KPIs, roles and responsibilities inside companies have to be defined alongside the creation and/or adoption of proper tools to ensure the reliability and accuracy of data that is collected. It is then important to maintain a monitoring system, to enable companies to reliably track progress.

The collection, measurement and monitoring of data has two key benefits:

- It helps companies to create a baseline, understanding their impacts, risks and areas for improvement

- It allows companies to differentiate themselves, increasing their appeal on the international market

53 UN Article: "The Race to Zero Emissions and why the World Depends on it" 2 December 2020. [online]
54 Adam Morton, Carbon Tariffs: what are they and what could they mean for Australia? The Guardian, 12 February 2021. [online]

Recommendations

1. Manufacturers to establish what data they already collect and what data should be collected in future

- As a starting point, Armenian manufacturers should evaluate the types of environmental and social information and data they are able to collect already, and which data they do not currently collect

- FDC could provide guidance for manufacturers by explaining the necessity and importance of having such data and by providing links to useful resources for data collection. Some useful resources that could inform environmental and social sustainability KPIs include:

  - GRI Standards

  - BCtA Indicators

  - UNCTAD proposed core SDGs reporting indicators

  - UN Global Compact-Oxfam Poverty Footprint

  - The Women's Empowerment Principles: Reporting on Progress

  - World Bank WDI

  - WHO Global Health Observatory Indicator

- FDC could also become an intermediary between producers and state authorities by supporting provision of information on national environmental and social requirements to producers

2. FDC to offer resources for manufactures relating to environmental and social management systems

- FDC could then become a point of contact for companies wishing to get further information on how to set up monitoring systems to collect environmental and social data. FDC could offer resources such as links to training sessions, or organisations that can help companies implement systems aligned to international standards such as GRI (in line with best practice)

3. FDC should carry out an annual survey to collect data from Armenian manufacturers

- The survey carried out by Eco-Age and FDC in 2019 could be expanded on and carried out on an annual basis, in order to better understand the Armenian industry, from impacts to key areas for improvement at both company and industry level

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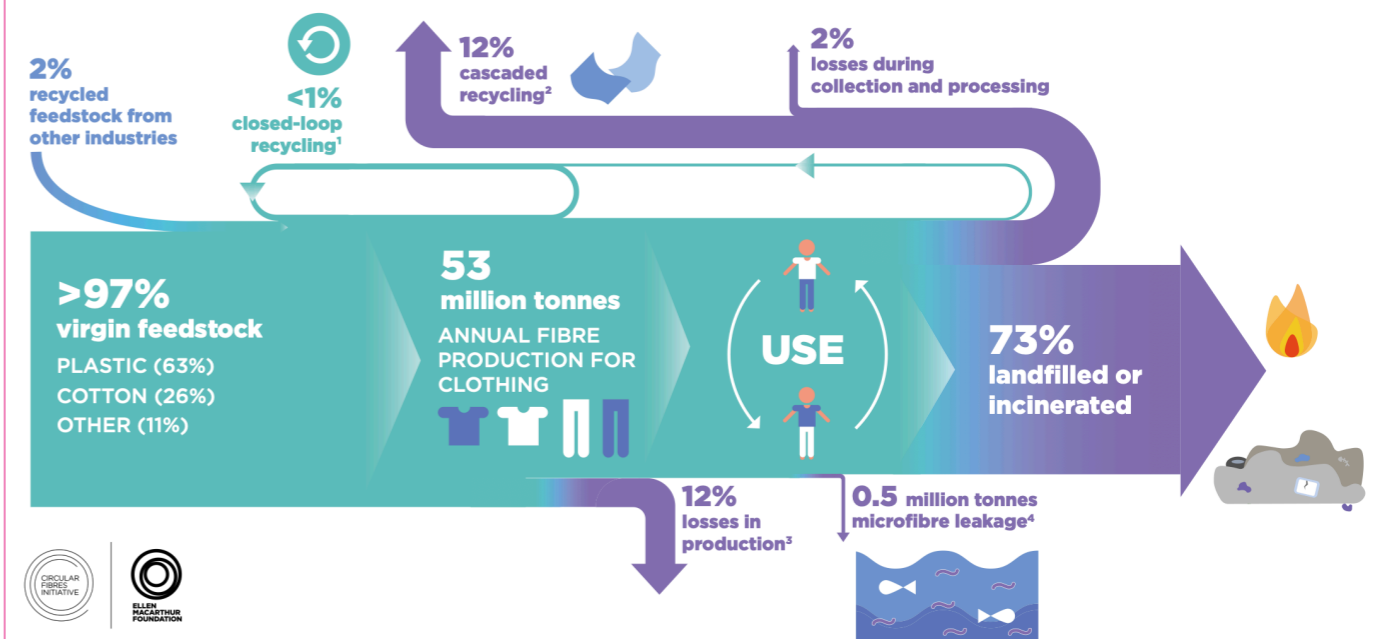# Investigate the Feasability of Developing a Recycling System in Armenia

One of the main objectives of this UK Good Governance funded project is to establish a textile recycling system in Armenia, in order to create the basis of a circular economy for the industry. Recent downturn in the Armenian economy and within the textile industry will continue to negatively impact on further growth, however, it is highly probable that Armenian manufacturers will continue expanding their businesses in the near future, which in turn will increase volumes for potential recycling. Hence, the main emphasis of the project has been put on investigating ways of recycling pre-consumer (post-industrial) waste into yarn, which could then be reused in production of textile products. This section investigates the options for establishing mechanisms of cooperation between textile producers and a national recycling company, based on understanding of the current textile waste of the Armenian fashion industry. Whilst the emphasis is on pre-consumer waste, the section also touches on the importance of Armenia taking post-consumer waste into consideration too.

AN OPPORTUNITY TO CAPTURE LOST VALUE

According to the Ellen MacArthur Foundation, is estimated that **less than 1% of all textiles worldwide are recycled into new textiles**[55], and that while 12% of materials used to produce clothing are lost in the production phase, including factory offcuts and overstock liquidation *(see Fig. 12)*[56]. In addition, 73% of end-of-use textile goes to landfill or incineration.

These figures represent a big opportunity to capture lost resources and create a potential new revenue stream. In Armenia, textile production constitutes 2% of the entire processing industry, so there is both a need and an incentive for Armenia to recycle its textile waste in line with European countries like Spain and Italy, which have textile recycling facilities and innovation in place, as well as countries like the UK, which has systems in place for collecting post-consumer textile waste. Indeed, Fashion Revolution in 2020 found that when choosing a clothing brand to buy from, 71% of consumers agree that it is important for brands to provide a service to take back

GLOBAL MATERIAL FLOWS FOR CLOTHING IN 2015

2% recycled feedstock from other industries

<1% closed-loop recycling[1]

12% cascaded recycling[2]

2% losses during collection and processing

>97% virgin feedstock
PLASTIC (63%)
COTTON (26%)
OTHER (11%)

53 million tonnes ANNUAL FIBRE PRODUCTION FOR CLOTHING

USE

73% landfilled or incinerated

12% losses in production[3]

0.5 million tonnes microfibre leakage[4]

1   Recycling of clothing into the same or similar quality applications
2   Recycling of clothing into other, lower-value applications such as insulation material, wiping cloths, or mattress stuffing
3   Includes factory offcuts and overstock liquidation
4   Plastic microfibres shed through the washing of all textiles released into the ocean

FIG 12.   Source: Ellen MacArthur Foundation New Textile Economy report

unwanted clothes for reuse or recycling.[57] Therefore, if Armenia is to expand to international markets such as the Europe, addressing the recyclability of clothes 'Made in Armenia' could be an important step. Indeed, according to the 2020 Conscious Fashion Report, which evaluated global search data from Lyst and Google from between February 2019 and February 2020, online searches for "recycled plastic" saw an increase of 35% from January to February 2020.[58] In Italy, searches for "recycled fashion" increased 64% over the final three months of the study period. Girlfriend Collective running leggings, which are made from recycled water bottles, saw an increase in demand in 2020 with page views up 244% year on year on Lyst.

+244%

PAGE VIEWS FOR GIRLFRIEND COLLECTIVE RECYCLED PLASTIC LEGGINGS

+64%

IN ONLINE SEARCHES FOR **"RECYCLED FASHION"** IN ITALY

55 Ellen McArthur Foundation (2017), A New Textiles Economy. [online]
56 Ellen McArthur Foundation (2017), A New Textiles Economy. [online]
57 Fashion Revolution, Consumer Survey 2020. [online]
58 Lyst Insights. The 2020 Conscious Fashion Report. [online]

ACTION FROM GOVERNMENTS AND BRANDS

EXTENDED PRODUCER RESPONSIBILITY

Governments and institutions, especially in Europe, are creating new standards for brands, setting incentives for recycling, and investing in recycling technology.[59] In 2019 for example, the French government re-approved the **"ECO TLC" initiative for the period 2020-2022, where retailers selling textiles, household linen and shoes are taxed in proportion to the volume of product they bring to the market**. Through this same initiative, retailers are also offered a tax reduction of 50% on clothes that are made with at least 15% recycled fibres. This initiative, which was created in response to the 2007 Extended Producer Responsibility law relating to textiles, household linen and footwear intended for households, intends to disincentivise overproduction and high volumes of post-consumer textile waste, while simultaneously incentivising textile producers to use recycled materials.[60]

ACTION DRIVEN BY EU LEVEL STRATEGY

A growing number of European initiatives are being proposed and established in order to reduce the impact of the global fashion and textiles industry. For example:

- **The EU Circular Economy Action Plan**, is a legislative proposal under the EU Green Deal which aims to i ncrease the circularity of the EU's economy. One of the key actions set out under the proposal, is to reduce resource consumption, waste, and pollution coming from the South Mediterranean region[61 62 63]

- The EU Circular Economy Action plan also aims to focus on resource intensive sectors with a high potential for circularity, one of which is textiles. As a result, The EU Strategy for Sustainable Textiles was proposed under the Action Plan. It outlines a comprehensive set of measures specifically for textiles where products are designed to be more durable, reusable, repairable, recyclable

and energy-efficient. It offers guidance on many factors such as achieving high levels of separate collection of textile waste, tackling the presence of hazardous chemicals, and encouraging industrial applications and regulatory measures such as extended producer responsibility[64]

- **The EU Make Fashion Circular** initiative by the Ellen MacArthur Foundation drives collaboration between industry leaders and other key stakeholders to create a textiles economy for the 21st Century

- **The 2020 Circular Fashion Plege, which launched during Fashion Revolution Week,** is a call to accelerate the industry's transition to a circular fashion system and outlines four calls to action, including a pledge to increase the volume of used garments and footwear collected, and implementing design strategies for cyclability[65]

In line with these strategies, we can see top European fashion groups and brands are making commitments to using 50-100% low impact materials (e.g. recycled or organic) across brands and products, respectively. For example, **Kering** has committed to increase the use of recycled materials across brands by 50% by 2025.[66] In line with this, Gucci has launched "Gucci Off the Grid", its first collection using ECONYL® regenerated nylon yarn. Several large brands have also committed to using 100% recycled or "sustainable materials" by 2025 or 2030, providing specific definitions as to what this means for them. For example, one brand defines sustainable cotton origins as "organic, BCI and recycled", whilst saying that it gives preference to materials with a high proportion of recycled and post-consumer waste.[67] Another brand defines sustainably-sourced materials as: organic and recycled cotton, recycled polyester and practices that use water and chemicals responsibly.

59 McKinsey & Business of Fashion, State of Fashion 2020. [online]
60 Ministère de la Transition écologique. Textiles Usagés. 2020. [online]
61 Ec.europa.eu. 2020. New Circular Economy Strategy - Environment - European Commission. [online]
62 SwitchMed, Developing Circular Value Chains, 2020. [online]
63 Directive (UE) 2018/851 du Parlement européen et du Conseil du 30 mai 2018 modifiant la directive 2008/98/CE relative aux déchets (Texte présentant de l'intérêt pour l'EEE). [online]

64 EC, Europa.eu., EU Strategy for Textiles. [online]
65 2020 Circular Fashion Pledge. [online]
66 Kering.com, 2020. Les Actualités Du Groupe. [online]
67 Inditex.com, Sustainable Materials. [online]

Challenges & Opportunities

Based on the results of the 2019 survey conducted by Eco-Age and FDC on Armenian manufacturers (representing 20% of the total market), Eco-Age was able to identify both challenges and opportunities for Armenia if it wishes to establish a national system for textile recycling. If Armenia wishes to invest in the most efficient and cost-effective recycling option for the country, there are a number of factors with regards to the physical waste itself that must be taken into consideration. These are: the type of waste treated (pre-consumer or post-consumer), the annual volume of textile waste produced by the country, and the composition of the textile waste separated by fibre type. This section of the report outlines these factors in more detail, using information known about waste produced by the Armenian fashion industry.

CASE STUDY — ELLEN MACARTHUR FOUNDATION

MAKE FASHION CIRCULAR

Make Fashion Circular drives collaboration between industry leaders and other key stakeholders to create a textiles economy fit for the 21st century. Its ambition is to ensure clothes are made from safe and renewable materials, new business models increase their use, and old clothes are turned into new.

BURBERRY   STELLA McCARTNEY

PVH   Salvatore Ferragamo   H&M Group

INDITEX   Gap Inc.

WASTE TYPE: PRE-CONSUMER VS. POST-CONSUMER WASTE

At present, Armenia is primarily interested in recycling pre-consumer (post-industrial) waste as it is generally more readily available for sorting and collection than post-consumer waste. For this reason, the challenges, opportunities and solutions discussed in the following sections of this report mainly deal with pre-consumer waste. However, as there is a global need to scale up the collection, sorting, and recycling processes for clothing after use, it is not discounted that Armenia should also investigate opportunities for collecting and recycling post-consumer waste at a later stage. Post-consumer waste management is a complex and expensive process, requiring additional infrastructure investments to collect the waste, but one that is considered necessary due to the extensive and growing amount of post-consumer textile waste.

In the UK for example in 2015, it was estimated £140 million worth of clothing goes to landfill each year.[68] UK NGO WRAP formed the The Sustainable Clothing Action Plan (SCAP) with the aim of bringing together clothing retailers, brands, suppliers, local authority representatives, recyclers, charities, trade bodies and the public sector to reduce the environmental footprint of clothing at the end of life and to unlock alternative sources to virgin fibres for manufacturing clothes.[69] SCAP's 'Love Your Clothes' campaign was developed to raise awareness of the value of clothes and how their lifetime can be extended, and is an effective example of how NGOs can serve to provide widespread national guidance and information to encourage repair and ensure more clothing and non-clothing textiles are collected for re-use and recycling.[70] The Love Your Clothes website provides information and tips to encourage people to consider the way they purchase, use and dispose of clothes with advice from the purchasing stage through to the disposal stage.

68 WRAP, 'Clothing' March 2015. [online]
69 WRAP, Fibre to fibre recycling: An economic & financial sustainability assessment, 2019. [online]
70 WRAP, Love Your Clothes Campaign. [online]

Once Armenia has successfully launched and established a textile recycling process in Armenia, it could investigate also collecting post-consumer textile as well. If not processed at the recycling facility, these clothes could be used for redistribution to low-income populations through charity initiatives, as well as being upcycled by designers.

VOLUME OF WASTE PRODUCED

Based on the survey carried out by Eco-Age and FDC in 2019, is estimated that the Armenian garment industry produces around **570 tonnes of pre-consumer textile waste per year** (40-45 tonnes per month). Prior to the 2020 pandemic, this figure had the potential to grow substantially in line with expansion strategies announced by several large producers, however this is yet to be assessed and it is likely that waste volumes could fluctuate significantly following the pandemic.

With this figure in mind, it is worth noting that during the project, Eco-Age conducted interviews with experts from global textile recycling facilities. According to

one, it is estimated that, on average, **a medium sized recycling facility processes around 500 tonnes of textile waste per month** (10 times the amount produced by Armenia in a year) and that anything below that volume is insufficient for a fully functioning recycling facility.[71] According to the same expert, the average initial investment for developing a cotton fibre recycling facility is USD 10 million, and high input volumes are important for the factory to be profitable and to allow for fluctuations in production that might come about due to seasonal factors or other external factors, such as the COVID-19 pandemic.[72]

WASTE COMPOSITION AND QUALITY

Figure 13 shows the breakdown of the types of fibres in Armenia's textiles waste. The graph is based on data provided by 9/17 companies that were able to provide information on the exact fibre composition of their textile waste, by percentage. Whilst the remaining companies have been discounted as they were unable to provide data on the exact composition, most of them stated that cotton was the main fibre in their

textile waste, using phrases such as "mainly cotton" or "majority cotton". Therefore, it is possible that the percentage of cotton fibre in Armenia's garment production textile waste is higher than that illustrated in Figure 13. Only one factory mentioned it produces wool fibre waste, stating that 55% of its waste is wool fibre. It did not disclose the remaining percentage of its waste, however there is a good opportunity here as wool is a valuable fibre in terms of its capacity for recycling.

It was found that cotton is the most common fibre type disposed of in Armenia, composing almost 50% of Armenia's textile waste. This offers a potential opportunity for moving towards a more circular fashion system, as cotton is a natural fibre that can biodegrade (although blending fibres and chemical treatments can impact biodegradability), and it can be recycled through both mechanical and chemical processes. However, much of the waste is also mixed fibres, which offers less opportunity to obtain quality fibre output.

The composition of textile waste (e.g. natural, blended or synthetic) will determine the recycling technique used (e.g. chemical or mechanical), which will consequently determine the quality and type of the final recycled material output (e.g. pure cotton). It is therefore worth understanding the composition before any investments are made.

There are two main methods of textile recycling: mechanical and chemical.

Mechanical recycling is the most widely used method to recycle materials, as it works by shredding textiles and processing the material to turn it into a near fibrous form.[73]

• Because this process involves **shredding textiles**, which shortens and damages the fibres, it generally results in low-value output like insulation and carpeting, rags or mattress stuffing[74]

• In order to **reach certain quality standards,** the recycled fibre needs to be mixed with a virgin fibre. For instance, if using regenerated cotton fibres,

these would generally need to be fused with virgin cotton fibre threads to obtain the needed quality and strength – the mix often approximating 20% regenerated fibres and 80% virgin[75]

• A minimum of 98% cotton fibre composition is required.[76] At present, mechanical recycling **cannot be fully applied to blended fibres** such as those that contain spandex or elastane, as it cannot separate the fibres. In these instances, the waste can be turned into lower grade outputs such as nonwovens that can be used for insulation, or automotive felt. Discarded jeans that contain spandex or elastane mostly end up as insulation or industrial wipes[77][78]

Chemical recycling is applied mainly to synthetic (e.g. polyester) and man-made cellulosic fibres (e.g. viscose), or a mix of both. It allows the recovery of more a valuable product and currently shows promising technological innovation. Although the industry is actively working on developing chemical recycling technologies for natural fibres, they are not yet fully technologically or economically mature.[85] Several start-ups, such as Evrnu® and re:newcell, are working with such technologies.[79]

Worn Again, one of the companies interviewed, is piloting a chemical recycling technology for synthetic fibers, cellulose fibers, and blended fibres (30% minimum polyester). The results are very promising, and they are now working on industrial implementation, aiming for a commercialization of the concept in 2 to 3 years.

Mechanical recycling is likely the best option for Armenia, given that the composition of its textile waste is mostly cotton fibres, and the fact that a chemical recycling process for natural fibres is not yet commercially viable. Please see the process outlined in Figure 14 overleaf.

As a standard process, in order to obtain a higher quality recycled material output, the waste inputs should be composed of the same fibres and be of a

FIBRE COMPOSITION OF TEXTILE WASTE FROM THE ARMENIAN FASHION INDUSTRY*

● COTTON (46%)

● POLYESTER (17%)

● COTTON / POLYESTER MIX (13%)

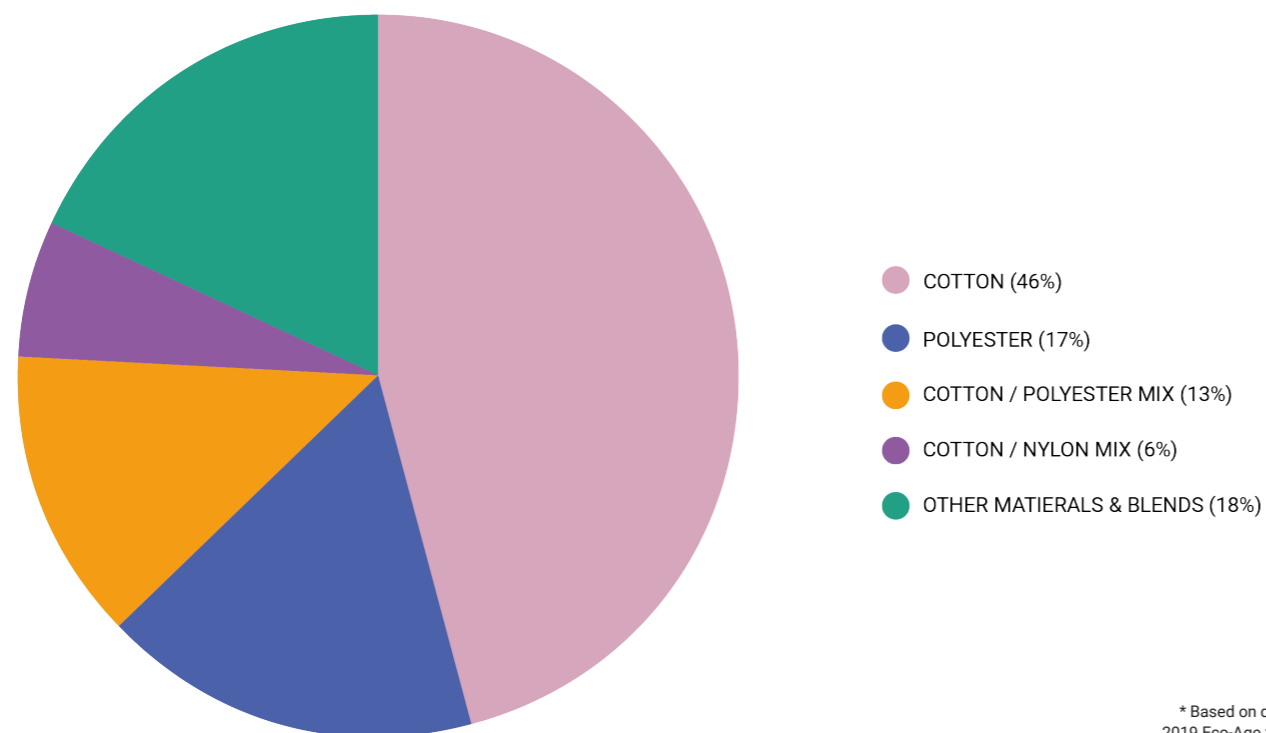● COTTON / NYLON MIX (6%)

● OTHER MATIERALS & BLENDS (18%)

FIG 13.
* Based on data from the 2019 Eco-Age x FDC survey

71 GIOTEX. 2020. [online]
72 Poguts, Stefano. 2020. Director of the Master Program of Green Management, Energy and CSR, Bocconi University. [online]

73 Ellen MacArthur Foundation. "A New Textiles Economy: Redesigning Fashion's Future". 2017. [online]
74 Europarl.europa.eu. "Environmental impact of the textile and clothing industry: What consumers need to know". 2020. [online]
75 Design for Longevity. 'Close the Loop'. [online]

76 Gould, H., 2020. Waste Is So Last Season: Recycling Clothes In The Fashion Industry. [online]
77 Design for Longevity. 'Close the Loop'. [online]
78 Grosso, Alberto. 2020. Business Development Manager, Marchi & Fildi. Interview online.
79 Gould, H., 2020. Waste Is So Last Season: Recycling Clothes In The Fashion Industry. [online]

similar colour.[80] In Armenia, the post-industrial (pre-consumer) waste, which in some cases may represent up to 20% of production volume, currently contains different cuts, scratch materials, threads, etc, of varying colours.[81] In order to make the recycling process effective, this waste would need to be sorted by type of material/fibre and by colour. This is especially important as currently there is no company in Armenia that could dye the processed waste. In addition, given that the mechanical recycling process reduces the fibre's quality and strength, the recovered fibre would need to be blended with either virgin cotton fibre or other fibres (preferably natural) to impart both increased strength, and to provide colour matching, thereby eliminating the need for re-dyeing.

THE GENERAL MECHANICAL TEXTILE RECYCLING PROCESS
This figure is reproduced from Ellen MacArthur Foundation's 2017 report, 'A New Textile Economy'

FIG 14.

ADVANTAGES OF MECHANICAL RECYCLING

- Most traditional and well established method
- Low environmental footprint

DISADVANTAGES OF MECHANICAL RECYCLING

- Yarns produced have lower tensile strength (must be blended with virgin or other synthetic fibre)
- Requires 100% cotton feedstock

RECAP: SOME KEY FIGURES FROM EXPERTS INTERVIEWED

+98%
cotton fibre composition required to mechanically recycle cotton fabrics for reuse in clothing

500 tonnes
average amount of waste processed monthly by a medium sized recycling company

$10M
average initial investment to develop a cotton recycling facility

80 Grosso, Alberto. 2020. Business Development Manager, Marchi & Fildi, Interview online
81 FDC, Interviews with Armenian Manufactures 2020. (Note that these figures are solely estimations)

Artik PHK Maralik

In search of a possible textile recycler, FDC visited local company Artik PHK (hereinafter referred to as "Maralik"), located in Maralik, a small city in the Gymri region. Shareholders have recently invested in new yarn production equipment (mainly from China) for this facility, so that the company has the necessary equipment to recycle pre-consumer textile waste items (fabric offcuts, scraps, etc), including a shredding machine and recycling machine. The recycling machine can process approximately 2 tonnes per hour, which at the moment far exceeds the total volumes of waste produced by the Armenian textile industry on an annual basis (est. 570 tonnes per year).

Although the company is willing to process recycled cotton into yarn and thread, there is currently no system in place to collect pre-consumer textile waste within the country. At present, Maralik procures recycled textiles in the form of flakes from Bangladesh and China and experiments with them to obtain the optimal recycling solutions. The quality of the materials varies depending on price - the cheapest materials can be purchased at about US $0.07-8/kg. However, due to the very low quality of material which needs further selection and sorting at the factory as well as high transportation expenses, the overall cost could reach US $0.20-25/kg. The wholesale price of thread made of recycled cotton

to be obtained from China can fluctuate in the average range of USD $0.3 to $1.0 per kg (FoB) depending on factors including thickness, quality, durability, volumes, etc.

Maralik has found that using homogeneous volumes of raw materials with the same colour and density produces better quality yarn. In addition, Maralik's machinery is able to process fibre mixes with small quantities of polyester. Equipment to do this has been purchased to enable blended fibre recycling to produce stronger yarn with a longer staple length. However, while most synthetic fibres are recyclable, the presence of any lycra or elastane creates technical difficulties in processing, and extracting of metallic parts (such as broken needles) from the raw input also presents challenges. This, however, could be solved by investing in relevant equipment (i.e. equipment which uses magnetic fields to find and remove needles and other metallic items from the input materials).

THE KEY CHALLENGES THAT MARALIK HAS FACED WITH REGARDS TO RECYCLING TEXTILES IN ARMENIA ARE:

- The volume of the textile waste that is possible to recycle is relatively small
- Currently, textile waste is not sorted at the factories by type of material/fibre nor by colours

SUMMARY TABLE OF KEY OPTIONS FOR ARMENIA

Based on the knowledge of Armenia's current practices and interviews with experts to better understand investment required and processes in place in existing recycling facilities, Eco-Age has identified three main ways that Armenia could treat its post-industrial waste. Each option has been assessed for its overall impact, as well as the difficulty of implementing each solution. The options are summarised in the table below. These options should be further investigated by the FDC.

If it is decided that Armenia is not producing enough waste to make Option 1 or Option 2 feasible, then Option 3 could be a beneficial first step for Armenia to move towards a more circular fashion system. Through establishing this as a first step, it would increase sustainability awareness in Armenia, establish logistical processes and demonstrate the potential financial gains that can be generated through recycling waste. Then, at a later stage, if Armenia's waste volumes were to increase, the collection and sorting infrastructure created could be used to divert the waste to an Armenian recycling facility rather than sending the waste abroad.

	SUMMARY	INTERNATIONAL COLLABORATION	ENVIRONMENTAL IMPACT & QUALITY OF OUTPUT	NATIONAL SOCIOECONOMIC IMPACT	IMPLEMENTATION & INVESTMENT
OPTION 1: RECYCLING	**Establish a recycling system within Armenia to recycle textile waste collected from garment production facilities around the country. This system would aim to keep the value of the yarn / material to create another usable yarn from it.**	✓ Armenia could investigate the possibility of importing pre-consumer fabric waste from neighbouring countries such as Georgia, in order to guarantee higher quantities of fabric waste for processing and allowing the project to be economically feasible ✓ Armenian factories could re-use the recycled yarn in production, which could appeal to European brands wanting to source clothes with recycled content	✓ Opportunity to maintain the quality of original fibre ✓ Opportunity for upcycling (a process whereby textile materials are converted to products of equal or greater value). That includes repair or redesign of certain post-consumer collected cloths (to add value) at certain factories/production facilities/designers' workshops and sale of the new, re-used (repurposed) products	✓ Local job creation. This option would involve investment and knowledge building on mechanical recycling. It would create the most local job opportunities ✓ Resource kept in the national value chain. This option is the only one that offers Armenia direct access to the recycled output	✗ This option would involve higher investment and knowledge building on mechanical recycling ✗ Might be costly to source and input virgin fibre required
OPTION 2: DOWNCYCLING	**Establish a downcycling system within Armenia. This system would recycle the discarded fabrics into items of lower value than the original input, resulting in a lower quality output such as rags for insulation, industrial rags, fill or carpet underlay. This material cannot be re-introduced in the fashion industry.**	✓ Armenia could investigate the possibility of importing pre-consumer fabric waste from neighbouring countries such as Georgia, in order to guarantee higher quantities of fabric waste for processing and allowing the project to be economically feasible	✗ Fibre quality is lost when downcycled	✓ Potential to investigate the feasibility of establishing cross sector partnerships with other industries nationally such as the housing or automobile industries in order to generate larger volumes of fabric waste ✓ Local job creation ✗ This material cannot be re-introduced in the fashion industry	✓ The process would not require the addition of virgin material so might result in lower costs than other processes ✗ This option would involve investment and knowledge building on mechanical recycling
OPTION 3: EXPORTING	**Establish a collection and sorting system in Armenia to collect, store, sort and export waste to established international recycling facilities that already have the capacity to process pre-consumer textile waste.**	✓ Armenia could partner with recycling companies around the world in countries such as Spain, the UK and Italy that have established systems for collecting pre-customer cotton waste from other countries to either recycle or downcycle it	✓ More waste could be averted from national landfill ✗ Armenia would not have access to the output if it is exported ✗ Environmental impact potentially high due to transporting the waste to international facilities	✓ This could generate income for the companies who decide to participate in such a system and sell waste internationally ✗ Resource not kept in the national value chain - little access to recycled output once it has been exported to another country ✗ Lower national social impact as less high skilled jobs created because these steps are processed at the international recycling facilities	✓ No investment in knowledge building around a recycling technique required as Armenia would not process the waste ✓ Potential to be less costly than the other options

TOOL FOR USING RECYCLED OFFCUTS IN DESIGN

From a design point of view and prior to establishing a recycling system, Armenian factories could look to invest in a tool such as that developed by Reverse Resources, which allows garment producing factories to understand possible solutions for different waste quantities and types. The tool could encourage factories to reuse offcuts in their designs, as the approaches outlined by the software could use over 20% of the factory offcuts. For offcuts that cannot be used in these ways, the software provides information of use to recyclers, with the aim of helping them pursue higher-value types of recycling.[82]

CASE STUDY
OFFCUT MAPPING SOFTWARE

Reverse Resources has developed software that measures the quantity of production offcuts, maps them by type, and allows the manufacturer to share relevant data with buyers. Three approaches have been developed:

1. Using offcuts invisibly on internal sections of a garment (e.g. pockets, cuff facings or the insides of shirt collars).

2. Using offcuts for small details on the outside of a garment, in the same colour as the rest of the garment or a contrasting colour. In this case, the piece of fabric is visible, but does not significantly affect the design.

3. Using offcuts for portions of other garments, which are specifically designed with a certain stream of offcuts in mind. This can increase their application in mass production and reduce design limitations. This approach does not directly reduce the waste in the production of one garment but uses the offcuts in the production of others and is therefore a very effective way of fabric recycling.

HOW WOULD A NEW RECYCLING SYSTEM LOOK IF DEVELOPED IN ARMENIA?

This section highlights the key operational components to take into consideration if Armenia opts for Option 1 or Option 2, and is to develop an efficient national recycling facility. It includes an evaluation of the current logistical systems and practices in place in Armenia and outlines a proposed pilot project that could be established. The organisation of the process seems feasible given the current existence of a potential recycling facility in Armenia.

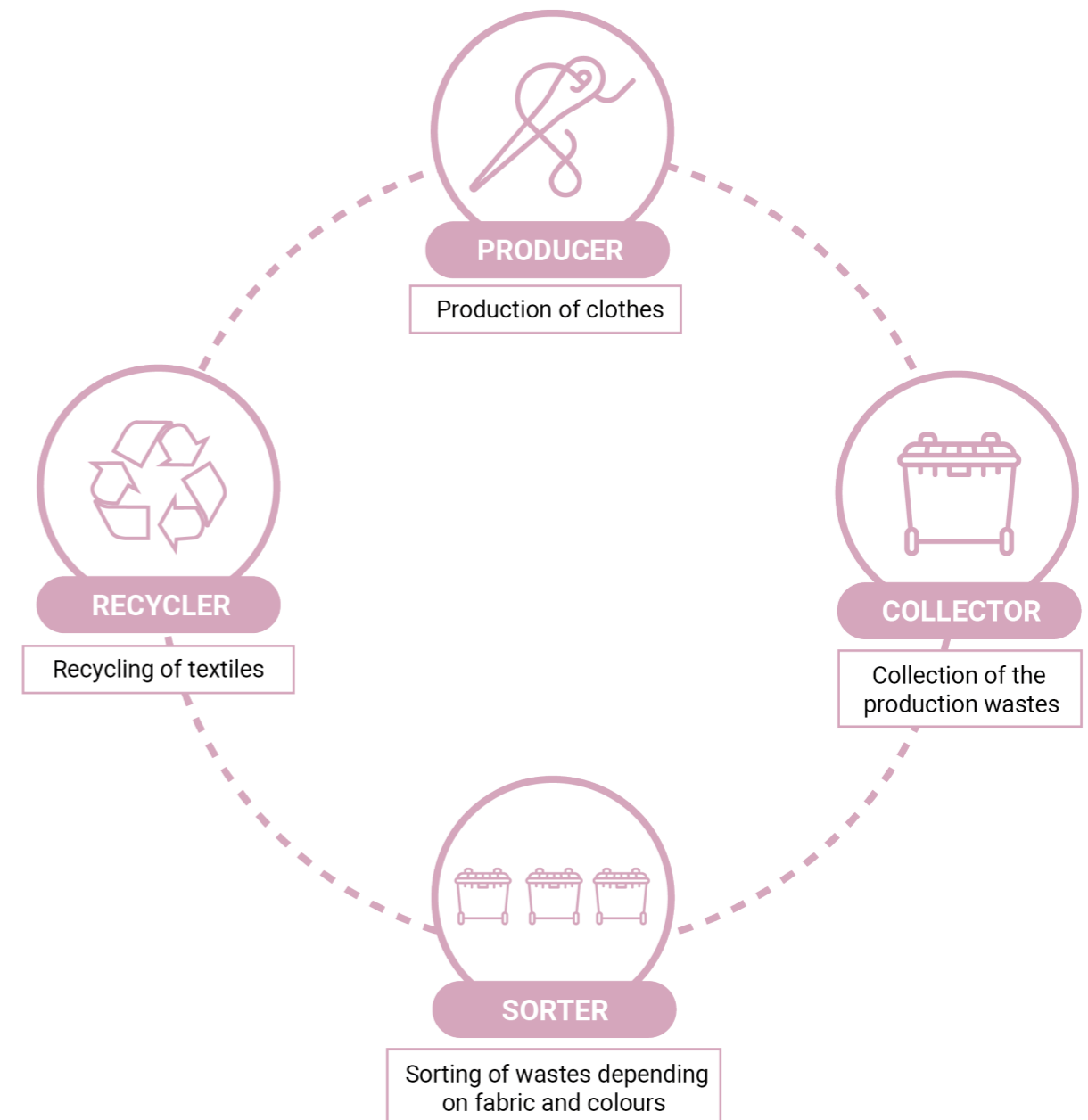Figure 15 illustrates the steps required, which are described in more detail overleaf.

FIG 15. Basic Diagram illustrating the key components needed for an effective recycliing system

[82] Ellen MacArthur Foundation. "A New Textiles Economy: Redesigning Fashion's Future". 2017. [online]

1. PRODUCER:

As mechanical recycling currently cannot process most blended fibres, a first step is to investigate the exact composition of materials currently disposed of by Armenia's production facilities, and sort and divide them by exact composition and colour[83], in order to avoid the need for bleaching and re-dyeing the fibres. Considering Armenia does not currently have a facility that could dye the fibres but only sort and collect, this step is key.

According to the FDC, at present the willingness of a producer to sell waste depends on its size and the volume of its waste. However, the State's approach to this project and its involvement is hoped to prove important in facilitating effective organisation and sorting of textile waste, irrespective of the size of companies or specifics of their production.

2 & 3: COLLECTOR AND SORTER:

In order to facilitate collection and sorting of textile waste, Armenia should establish a special purpose company dedicated to these activities (from now referred to as the 'Operator').

- **3a: Post Industrial waste:**
  The Operator will cooperate with local large and small textile facilities / production companies to collect post-industrial waste that is pre-sorted by composition and colour to ensure high quality output. The Operator would then re-sort the waste in its facility. The textile waste should be obtained from factories at a price based on cost/benefit analysis and depending on the material type. Within the scope of the base scenario of recycling in Armenia, a preliminary estimation shows that the price for collecting sorted waste from factories could be set at up to US $0.15 /kg, depending on type of material (or AMD 75 /kg at the current exchange rate)[84]

- **3b: Post Consumer waste:**
  At a later stage the Operator could also be involved in the process of collecting post-consumer waste, gathering used clothing from the public. This would involve setting up collection points across Armenia, beginning initially in the capital Yerevan where the population is higher. It is likely that additional operating and sorting facilities will have to be established, as well as scaling up collection routes. The post-consumer waste could be partially re-distributed to charity organisations, while the remaining suitable items would be recycled

4. RECYCLER:

The Operator would then sell the waste textile to the "Recycling Manufacturer", initially the aforementioned Maralik, where the recycled waste will be converted to yarn. The raw materials could be pre-sorted and sold to Maralik for around AMD 150 /kg to cover collection and other business costs of the collecting company.[85] Maralik can then produce yarn to be used in items currently produced in Armenia, such as socks and worker's gloves. Some of the thread and yarn produced could be sold to designers and craftsmen.

If scaling up then the location of the facility is important, as it should be easily accessible by road or rail in order to allow producers and collectors to collaborate easily, but also for facility employees, as a recycling facility can be very human intensive.[86]

Finally, this system will only work if the producers and collectors have access to the necessary education tools, so they have the proper skills and expertise to manage this valuable resource and sort it in the best way possible. As mentioned in the Collaboration chapter of this report, the FDC, in partnership with the Government of Armenia, could play a role in facilitating the necessary training and education.

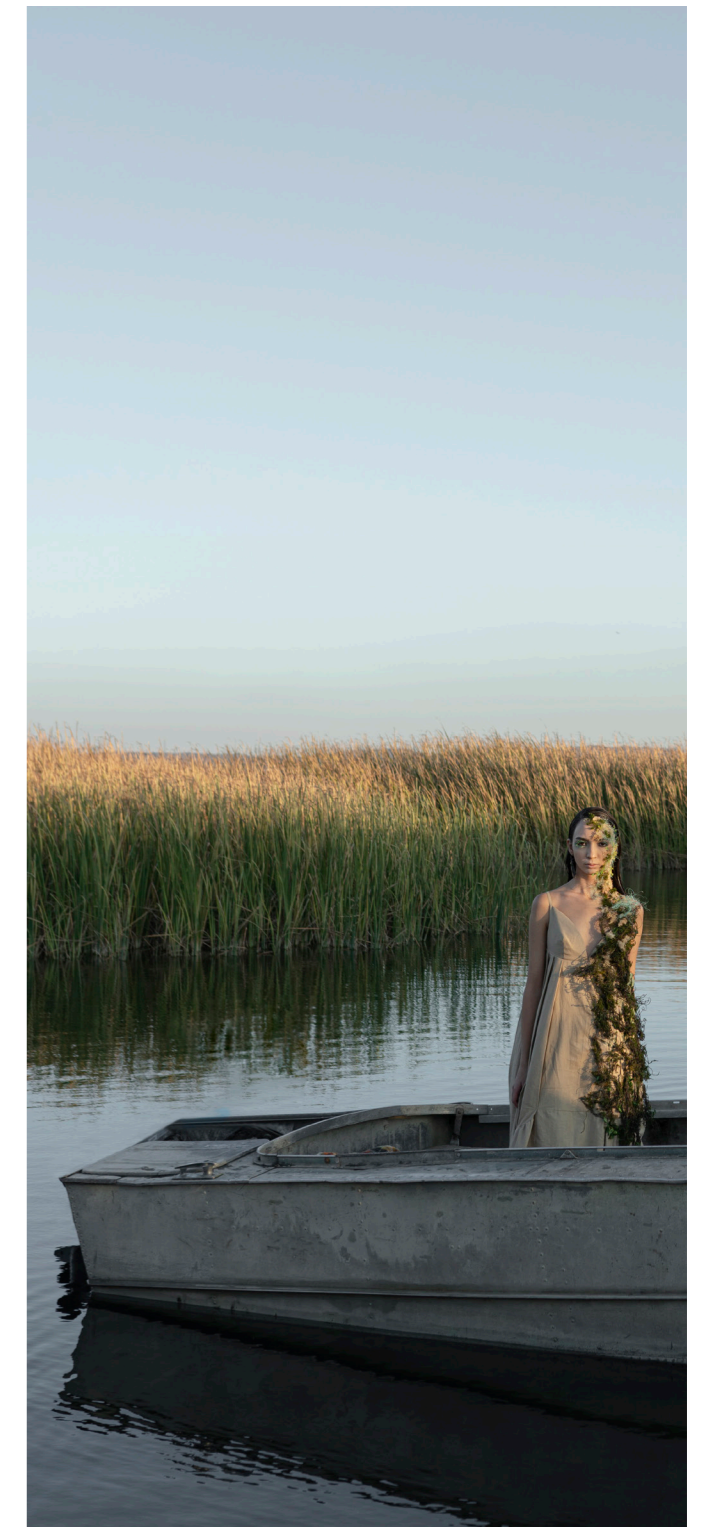## PUBLIC AND PRIVATE SECTOR COLLABORATION

A recycling system requires effective collaboration between producers, collectors, sorters, and recyclers. In Armenia, such a process could involve collaboration from the Armenian government, NGOs and the private sector, and for this reason it is fundamental to involve these entities from the ideation stage of the project.

**CASE STUDY
FRANCE**

ECO TLC — L'éco-organisme du textile · du linge · de la chaussure

In France, the not-for-profit private company **ECO TLC**, which is accredited by the French public authorities, fosters the collection, recycling and recovery of all used clothing, linen and footwear across the country. The Company was formed in 2007 following the introduction of the Extended Producer Responsibility scheme in France. The Company gathers all stakeholders of the TLC (textiles, household linen and footwear) industry, from designers to local authorities, in order to develop circular economy approach. [87]

A similar company could be created in Armenia in order to collect waste from producers, as well as sorting it before sending it to a recycling facility. This company could also serve as an educator for the industry, gathering data from across the Armenian industry, explaining best practice in the sector and promoting the importance of recycling.

83 Close The Loop. "End Of Life". 2020. [online]
84 FDC, Interviews with Armenian Manufactures 2020. (Note that these figures are estimations)

85 FDC, Interviews with Armenian Manufactures 2020. (Note that these figures are estimations)
86 Pogutz, Stefano. 2020. Director of the Master Program of Green Management, Energy and CSR, Bocconi University. Interview online

87 Ministère de la Transition écologique, Textiles Usagés. [online]
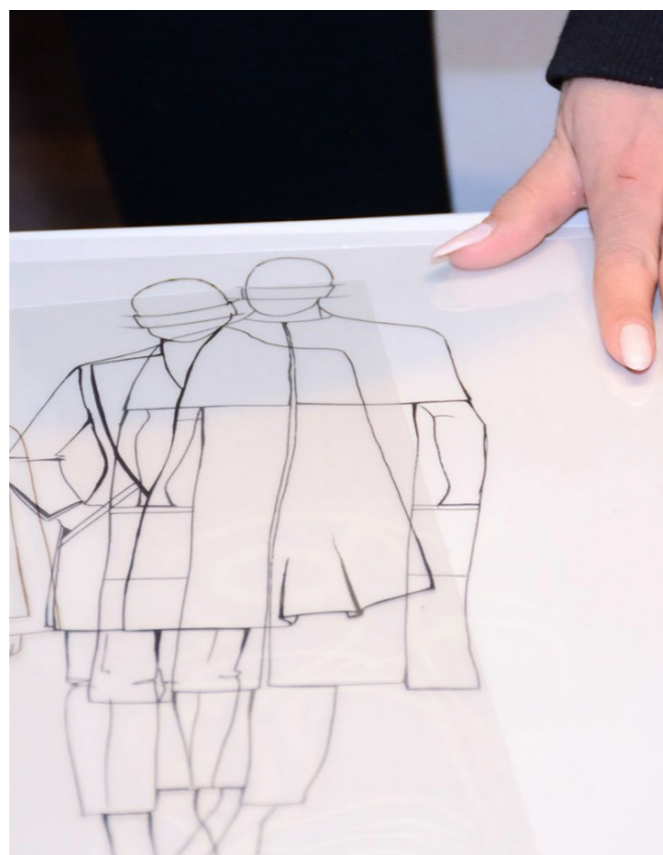
Recommendations

SUMMARY OF FINDINGS

The garment industry in Armenia is already important at a national level – it grew by 23% from 2018 to 2019 and was set to continue on this growth trend prior to setbacks caused by the 2020 COVID-19 pandemic. Based on information from the companies that took part in the 2019 survey conducted by Eco-Age and FDC (representing 20% of the total market), it is estimated that the Armenian fashion industry produces around 570 tonnes of pre-customer waste per year, the majority of which is cotton fibre, which makes it of great value if properly sorted, as it is easier to recycle than other fibres and blends.[97] There is an opportunity to capture and give this waste new value, as currently there are no recycling facilities or established national procedures within Armenia to process pre-consumer textile waste.[88]

However, the volume of textile waste produced by the fashion industry alone is currently insufficient to develop a cost-effective national recycling system. It is worth noting that prior to COVID-19, strategic plans of several large textile companies and proposed investments increased the forecast for waste volumes by 25-30% in the upcoming 2-3 years.[89]

At present though, volume adjustments should be taken into account and if further investigations show that the fashion industry's textile waste volumes will remain at current levels, then Armenia could investigate creating partnerships with neighbouring countries such as Georgia to import waste from these countries, or collaborating with other national sectors to collect more textile waste.

These are both potential options if Armenia wishes to transform textile waste into a new resource, provide positive social impacts through job creation and open up new opportunities in markets where demand for lower impact materials are high.

Given the existence of existing recycling equipment and facilities in the country, it is recommended that Armenia continues to engage in conversations with Maralik.

PROPOSED NEXT STEPS

In order to ensure the best solution is selected for Armenia, and before beginning the development of a recycling system, there is still some information that would be mandatory to acquire in order to draw up an accurate picture of the investment required and the available resources. These are outlined below:

Composition and volumes of textile waste

- The FDC should carry out a follow up assessment with the fashion companies within Armenia following this project, in order to continue to obtain clear information with regards to the composition and volume of their waste, as well as to understand willingness to sort and sell waste

- If it is decided to scale up the project, the FDC should carry out an investigation into other industries in the country producing textile waste (e.g. automotive or hotel) and work with them to establish the composition and estimated volumes of their textile waste

The facility and processing

- Given the relatively high cost of setting up the new recycling factory it is advisable to start using existing facilities of Maralik as a pilot project. The experiments with recycled materials processing should be continued at Maralik to understand the level of quality of production. However, it is worth noting that at present Maralik imports waste from China. While the cost of importing is cheap, these materials pose a potential social risk, are not easily traceable and have a high transport footprint. If possible, the company should investigate using waste from neighboring countries or other national sectors, rather than importing waste from Asian countries

The role of the government

- The Government's role in facilitation of sustainable textile production is extremely important given that the likelihood of the market investing in innovations is a result of a clear demand for recycled fibres (e.g. in the public procurement tenders, in international mass production orders or other market interest)

  - The Government could introduce industry-related legislative changes (e.g. requirement for factories to sort waste output by materials and colours) and a minimum requirement for H&S and environmental standards

  - Together with this request, the Government may provide tax incentives to producers for hiring relevant personnel for collecting and sorting textile waste in their facilities

  - In addition, it could establish economic incentives for companies that are on the way to adopting international best practices in line with sustainable production

  - The Government may also start discussion on reviewing public procurement requirements for textile products, giving priority to products made from recycled textiles

88 Eco-Age. 2020. "FDC Project SOW". Document, 2020.
89 FDC, Interviews with Armenian Manufactures 2020. (Note that these figures are estimations)

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Facilitate a Collaborative Approach & Enable Innovation

With a plethora of sustainability related information and resources available to brands, consumers and manufacturers alike, it is important to be able to navigate this space with trusted and reliable sources.

The Fashion Design Chamber is the key non-profit organisation within Armenia, that serves to promote Armenian fashion design worldwide and support its designer businesses by sharing knowledge and resources and coalescing the different interests within the Armenian fashion industry. The FDC is therefore an essential organisation for promoting innovation, enhancing sustainability learning and encouraging "eco-production" within the industry. The FDC has this role in Armenia and should seize the opportunity to work along with the Armenian Government to harness collaboration, especially in the area of sustainable fashion, and to develop public-facing resources that can be accessed by all from a range of sectors connected to the garment industry.

Challenges & Opportunities

The Armenian textile and garment sector is currently comprised of 106 large and small companies, and is growing. There exists an opportunity for the FDC to harness its platform to share information on sustainability in fashion with these companies as well as Armenian fashion designers, facilitating collaboration across the industry. The 2019 survey of Armenian manufacturers by the FDC and Eco-Age, as well as the manufacturer and designer sustainability training sessions organised by the FDC and Eco-Age in 2020-2021, are good examples of such collaboration, and show great potential and willingness from the industry to commit to more responsible practices. The FDC should continue on this path, maintaining and building on these collaborations, in order to become the industry beacon for knowledge, education, collaboration, and events.

The Armenian Government, in collaboration with the FDC, could also play a role in facilitating and enabling innovation, especially with regards to promoting sustainable production and recycling (economic and environmental aspects). The Government's role is vital in setting up a proper legal and economic environment to encourage sustainable eco-production and recycling of textile waste, and in providing support where challenges arise, such as the COVID-19 pandemic ramifications to supply chains, sourcing and logistics.

Recommendations

Recommendations to support the facilitation of a collaborative approach and increased innovation in Armenia have been divided into three key areas:

RECOMMENDATIONS FOR THE FDC:

1. **Establish an online sustainability resource hub** on the FDC website and further develop the tools and frameworks that are currently in place on the FDC Facebook page, in order to further enhance the FDC's role as the main industry body for resources and knowledge.

2. **Devise a working group facilitated by the FDC**, to foster collaboration between the fashion industry and other industry sectors, as well as the Armenian Government.

3. **Become a platform for dialogue between the industry and educational institutions**, thus reducing the existing gap and ensuring improvement of educational subjects in order to meet the requirements of the industry.

RECOMMENDATIONS FOR THE ARMENIAN GOVERNMENT:

4. Government: potential **steps the Government could take to strengthen collaboration and facilitate sustainable development** of the Armenian fashion industry.

Recommendation 1: Establish an online sustainability resource hub, expanding the tools and frameworks available to the industry

Currently, the FDC uses Facebook as a platform to provide insights and share updates about Armenian fashion industry. It also uses Facebook to announce upcoming webinars and events, and to share

sustainability-related information. As a first step, the FDC could investigate the feasibility of expanding this offering and creating an online and easily accessible resource hub on the FDC website. Within this, the FDC could have a section dedicated to sustainability resources, creating an online sustainability resource hub, offering opportunities for education and networking.

EXAMPLE CONTENT TO INCLUDE ON THE ONLINE HUB:

The platform could be established as a "sustainability fashion directory" for the Armenian fashion industry, providing free public resources for everyone. It could become a knowledge reservoir for the industry by bringing all the necessary information and literature together in one place.

CASE STUDY
SUSTAINABILITY RESOURCE HUB

C𝓕DA

CFDA Sustainability Resources is a free and extensive online hub that offers open access resources for sustainability. It features downloadable and digestible content for users to learn more about topics such as packaging, manufacturing, materials, design, footwear, recycling and end-of-use, customer care and repair.

The platform could host the latest news and industry insights and provide updates to companies about industry developments, as well as new services and resources from the FDC.

The FDC has hosted a number of online events and workshops in partnership with organisations such as Eco-Age and Fashion Scout, including workshops for designers on sustainability, and training on sustainability-related certifications. Currently, these events are not archived and saved, however if the FDC was to create an online resource hub, it could host exhibitions, webinars, and digital shows on the platform to foster regular innovation and inspiration and enable collaboration between fashion and textile industry players.

CASE STUDY
ONLINE EVENTS

PREMIÈREVISION©

Premiere Vision has adapted to the constraints of the COVID-19 pandemic by hosting online events that included webinars and discussions, interviews, designer exhibits, and material spotlights.

CASE STUDY
ONLINE EVENTS

supplyCompass

Supply Compass is a sourcing platform that hosts a range of online events including webinars, discussions, and interviews.

The FDC could also use the platform to showcase research it has conducted in relation to sustainability topics (such as a summary of key findings from this report and next steps for the industry).

CASE STUDY
RESEARCH & INDUSTRY BRIEFINGS

CFDA

The American Fashion council (CFDA) carries out an annual diversity and inclusion briefing. Its 2021 diversity and inclusion briefing is particularly important following the tragic and senseless acts of racial injustice in 2020 – including every life lost at the hands of racism in the United States and the disproportionate impact of COVID-19 on communities of colour. Such briefings demonstrate the fashion council's ability to provide important insights, in an attempt to drive positive change in the industry. The findings of the briefings are published online on the CFDA platform, free for anyone to access.

Recommendation 2: Establish a working group to foster collaboration between the fashion industry and other sectors, as well as the Armenian Government

Partnering with the Government, the FDC could drive and facilitate a working group to discuss key sustainability issues, enabling collaboration between the fashion industry and other sectors (e.g. leisure and hotel, agriculture, automotive, universities / colleges etc.). This could be beneficial for exploring partnerships for waste and recycling of textiles. Additionally, it is essential for apparel companies to embark on ambitious supplier- partnership programmes. Establishing a working group could help to encourage this.

CASE STUDY
WORKING GROUP

Camera Nazionale della Moda Italiana

CNMI's Working Group on Sustainability is split into three categories: Chemicals Technical Working Group; Retail Technical Working Group; and Chemicals Analysis Working Group. The Sustainability Committee website page features guidelines for detoxing supply chains, sustainability in retail, a roadmap for sustainability, and details on the annual Fashion Roundtable on Sustainability.

CASE STUDY
ROUNDTABLE

FR

The All-Party-Parliamentary-Groups (APPG) Fashion Roundtable is uniquely placed to leverage access and policy outcomes that makes the fashion industry more sustainable and inclusive, while adding value to the economy and wider culture of the UK.

Recommendation 3: Suggested Government Action to strengthen collaboration and facilitate sustainable development

Some recommendations that could further strengthen the Armenian Government's demonstration of commitment to eco-production, and will facilitate sustainable development of the sector are presented below. Note that this list is not exhaustive and could be added to at a later stage:

Textile recycling

- The Government could introduce legislative schemes that encourage companies to sort the textile waste at factories by type of materials (cotton, polyester, mixed, etc.) and by colours

- The Government could encourage the private sector to establish a textile waste collecting/ operating company - the "Operator" - through relevant support programmes or by encouraging investments in this sector through Private Public Partnership (PPP)

- Tax exemptions could be provided to companies that are hiring additional staff for sorting and storing textile waste in factories

Tax relief and procurement planning

- The Government may decrease/eliminate appropriate taxes levied on Operator and/or Recycling Manufacturer (those could be the same legal entity). The elimination of VAT taxes on relevant recycling equipment to be procured from abroad (these may include (i) special equipment that examines the composition and the quality of materials or dyes used in fabric, threads, etc; (ii) equipment used in recycling processes such as for shredding, cutting, combing, etc.). The profit tax exemption for certain period (e.g. up to 3 years) may also be considered

- The Government may encourage textile companies that have already got or are on the way to obtaining international certifications and are adopting best practices relating to eco-production. For example, relevant equipment imported for organizing clean production, such as filters, emission reduction and other facilities, could be exempt from certain custom duties, taxes, etc

- The Government may encourage public procurement of textiles made from recycled yarn or materials processed within the country. The State could develop a national procurement plan for encouraging circularity within the textile industry. This could include revision of procurement criteria and promotion of the purchase of recycled textile products. For instance, the Ministry of Defence is one of the largest public procurers and users of textile products including clothing, underwear, socks, bed linens, and towels. Therefore, in its calls for tenders it can include a requirement that a certain percentage of the offered production must be made from recycled materials/yarn processed within the country. That specifically could be applicable to socks made from recycled yarns/threads with various compositions like cotton, cotton-polyester, cotton-wool blends (for cold weather), etc. In addition, the down-cycled materials such as compressed textile could be used as filling in mattresses and could also serve the needs of the Ministry of Defence, as well as the prisons system.

Government supported testing and standards

- In Armenia, tests and examinations are carried out at a couple of existing laboratories and research companies in Yerevan, such as the "Narek" scientific research enterprise and the International Certification Center, that provide certificates of compliance with Eurasian Economic Unions' standards. In order to strengthen existing testing and standards, The Government could, either itself or by using a Private Public Partnership scheme, set up a new laboratory or enhance the capacity of the existing ones, with the aim of: examining the quality and defining the composition of imported fabric and yarns; testing the chemicals, detergents and dyes used in materials and fabrics; evaluating their safety and durability, and providing proper certifications of compliance for raw materials

- The Government could request mandatory laboratory testing of raw materials at border crossing points and could also propose that laboratory facilities be located at the border. This is would service to help textile companies comply with chemical, biological and other safety standards and requirements introduced by EaEU and the EU. The establishment of modern, technologically equipped laboratories is important for the development of sustainable production and proper organization of textile waste recycling processes

- The Government could develop relevant guidelines and procedures based on international best practice on environmental, social, and safety standards. It could also conduct awareness raising campaigns for the producers. In addition, occupational health and safety and labour rights protection issues should become a priority for the Government and industry

Stakeholder engagement

- In 2020, the Government took steps to address the use of plastics in the country, committing to ban, by 2022, the the use of single-use plastic bags such as polyethylene sacks and bags of up to 50 microns in thickness (except for sacks used for wrapping and sacks and bags made from secondary raw materials). Following on from this, The Government, in close collaboration with NGOs such as the FDC and other interested parties, could introduce campaigns and other initiatives to raise public awareness of other environmental and social sustainability issues faced at a global level, and their relevance to Armenia's textile and fashion industry. In order to ensure engagement at all levels of the supply chain, it is important that these campaigns target consumers as well as producers, in order to educate consumers on the challenges and opportunities regarding the sustainable development of the sector, and possible sustainability related issues that may be faced in the coming years

Conclusion

Despite the fact that the development of a sustainable ecosystem for Armenia is still in its infancy, it is evident that the building blocks are in place and there is a strong willingness to implement change.

As highlighted by each of the five areas of the report, in order for change to happen, actors at all levels of the Armenian fashion and textile supply chain need to work together to find solutions to technological challenges arising at each stage of the supply chain.

Education is an essential enabler to developing the Armenian fashion and textiles sector, incorporating all stages of the supply chain from designers to manufacturers. Ongoing education through online tools and workshops will drive engagement and a shared understanding of sustainability challenges and opportunities facing the industry in Armenia. This is something that is already being pursued by both Government and relevant NGOs such as the FDC, which has launched a public awareness campaign about the sustainability issues faced by the industry.

Finally, if Armenia wishes to develop a national recycling system in place of exporting its waste, further research could provide a more comprehensive picture of the volumes and composition of waste produced across the country, as well as opportunities to sell waste to manufacturers with existing technologies in place to carry out mechanical recycling.

A continued feasibility study should run in parallel with efforts by the Armenian Government to adopt legislative and economic amendments, which will push improvements related to sustainable development objectives.

Appendix 1

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