



# The future of work in textiles, clothing, leather and footwear



# **The future of work in textiles, clothing, leather and footwear**

**International Labour Office  
Geneva**

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## Foreword

The future of work is the central theme of numerous events and debates across the globe in 2019 to commemorate past achievements of the International Labour Organization (ILO) and celebrate its centenary.

At the official start of these celebrations, on 22 January 2019, the Global Commission on the Future of Work launched its report, *Work for a brighter future*.<sup>1</sup> It contains wide-ranging recommendations for the constituents of the ILO – governments, employers and workers – and other partners on how to shape a future that works for all. The report will be submitted to the International Labour Conference in June 2019, during which tripartite delegations from the 187 Member States of the ILO will discuss the policies and actions that the ILO should promote to effectively pursue its mandate of peace and social justice in its second century of service to the world of work.

This working paper on the future of work in textiles, clothing, leather and footwear (TCLF) has been prepared for ILO constituents and other key actors in the TCLF industries to facilitate their discussions in the centennial year of the ILO and beyond. While it focuses on opportunities and challenges in TCLF manufacturing, it also touches on the implications for other segments of the supply chain, from cotton growing to retail. It is part of the ILO's sectoral programme of work for 2018-19, adopted by the ILO Governing Body in 2017, which comprises research on trends and challenges in the organization of work and production in different sectors with a view to making unique sector-specific contributions to the global debates on the future of work.

This working paper is the result of the combined efforts of colleagues in the ILO's Sectoral Policies Department, which promotes decent work by supporting the Organization's constituents in seizing opportunities and addressing challenges in 22 different economic and social sectors at the global, regional, and national levels. The paper was prepared by Casper N. Edmonds, Beatriz Cunha, William Kemp, and Emelie Lindström, under the overall supervision of the Sectoral Policies Department's Deputy Director Akira Isawa, and Director, Alette van Leur. Valuable input, comments and guidance were received from Fernanda Barcia de Mattos, Janine Berg, Lars Bergqvist, Andrea Davila, Jeffrey Eisenbraun, Michael Elkin, Martin Hahn, Iskandar Kholov, David Kucera, Dorothy Lovell, Anne Posthuma, Norma Jean Potter, Johanna Silvander, Daniel Vaughan-Whitehead, and Michael Watt.

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<sup>1</sup> ILO: [Work for a brighter future - Global Commission on the Future of Work](#) (Geneva, 2019).

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## 1. Introduction

The mass production of textiles in the 18th century was the dominant industry of the first industrial revolution, and the first to use modern production methods. Building on innovative technologies such as the power loom, the cotton gin, and the sewing machine, the mechanized manufacture of textiles, clothing, leather and footwear (TCLF) led to new ways of organizing production and work in other sectors as well.

The industries rapidly became the economic powerhouses of the newly industrialized European countries, contributing to economic growth and job creation. Yet workers in textile factories, the majority of whom were women, faced harsh conditions, worked long hours, and earned low wages.

By the early 20th century, the industries in Europe and the United States often employed immigrant workers in workplaces branded as “sweatshops”. As the pace of globalization increased rapidly in the 1980s, TCLF manufacturing steadily moved to factories in developing countries with low labour and manufacturing costs.

Today, the industries are key to the economic and social development of many developing and emerging countries and are an entry point to global supply chains and export markets. These highly labour-intensive industries provide employment opportunities to millions of women and men, and have helped lift millions more out of poverty.

Nevertheless, the industries’ growing environmental footprint and the prevalence of poor working conditions in some firms in some countries – analogous to those observed in Europe and the United States a little over 100 years ago – have caused labour and environmental advocates to conclude that the current model of consumption, production, and organization of work is unsustainable. The tragedy of the Rana Plaza building collapse in Bangladesh in 2013 that cost 1,134 women and men their lives has brought worldwide attention to the urgent need to improve workplace safety and working conditions in the industries. It has also sparked numerous multi-stakeholder initiatives to advance decent work and sustainability in the industries.

This paper explores how technological advances, climate change, globalization and changing demographics will shape industries in the future. It then analyses the challenges and opportunities these drivers and megatrends bring for the realization of decent work. This is followed by a discussion of the future of TCLF production in three different categories of countries. The paper concludes with a call for action to shape a future that works for all – for the tens of thousands of mostly small and medium-sized enterprises as well as the millions of mostly young women workers that produce the clothes, shoes, and accessories we all wear.

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## 2. Megatrends and drivers

Technological advances, globalization, climate change, and changing demographics are broad and interconnected megatrends that have driven profound changes in the industries in past decades. This chapter examines the specific drivers and megatrends that are most likely to change the industries in the future in equally or perhaps more profound ways.

### 2.1. Technological advances

With the advent of laser cutters, 3D-printing, and sewbots, industry observers have focused their attention on the potential of robotics and automation technologies to increase productivity and facilitate a process of re- or nearshoring of production. This could have a negative impact on employment in the industries and cause significant disruption.<sup>2</sup> In the past few years, however, the debate has increasingly shifted to the potentially much greater impact that digitalization will have across TCLF supply chains, with critical implications for a range of occupations and tasks in the industries, not only in manufacturing but also in design, marketing, finance, logistics, and retail.<sup>3</sup> At the same time, the industries are undergoing a silent revolution with regard to the development and use of new materials.

#### 2.1.1. Robotics and automation

The industries have historically been slow in terms of their adoption of new robotics and automation technologies. So called “sewbots” were first developed in the 1980s, but were largely disregarded by the industries due to the diversity of materials and processes involved, and due to the relative cost advantages of sourcing production from developing countries with low labour costs. This outsourcing of production from 2000 to 2015 caused a sharp drop in employment in the industries in Europe and the United States, by 42 per cent and 66 per cent respectively. While there has been an increase in the sales of robots in the industries in some countries in recent years, these have by far been exceeded by sales of robots to the automotive and electronics industries.<sup>4</sup>

The relatively slow uptake of automation could be about to change, however. Automated technologies and robotic sewing systems are coming back on the market, augmented by digitalization and in more advanced and integrated forms (Box 1).<sup>5</sup> Industry experts suggest that robotics and automation will advance rapidly and that these technologies will soon be able to facilitate a growth in re- or nearshoring, which has the potential to bring major disruption to the industry in terms of employment and production.<sup>6</sup>

<sup>2</sup> D. Kucera: *Robotics and Reshoring: The Apparel and Footwear Industry* (Geneva, ILO, forthcoming).

<sup>3</sup> J. Kern, A. Vogt: *Future. Fashion. Economics. A guide to future-oriented, responsible economic thinking in the fashion industry* (Frankfurt, dfv Mediengruppe Fachbuch, 2017).

<sup>4</sup> D. Kucera, op. cit.

<sup>5</sup> Textiles Intelligence: “Business and market analysis for the global textile and apparel industries”, in *Textile Outlook International* (2018, No. 192, July).

<sup>6</sup> ILO: [\*ASEAN in Transformation: Textiles, Clothing and Footwear: Refashioning the Future, Working Paper\*](#) No. 14, ILO, Employers’ Activities (Geneva, 2016).



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**Box 1: Automated technologies transforming the industries**

**Laser cutting** has evolved rapidly during the past two decades and has already replaced hand cutting of fabrics in many factories.

**Sewbots** in the planned Tianyuan factory in Little Rock, Arkansas, will be able to produce 1.2 million T-shirts a year at a price of approximately \$0.33 each – less than what is currently possible in low-cost countries.

**3D printers and robotic arms** that produce running shoes in Adidas' brand-new, heavily automated manufactured facility in Ansbach, Germany, have attracted media attention due to the potential the technology has to facilitate the re-shoring of production to Germany and the potential negative impact this could have on the estimated one million workers in the company's supply chain and the developing countries it sources from.

**Knitting machines** that produce sweaters in two hours have been introduced in high street stores as part of the industry's effort to bring production closer to key markets and consumers.

Nevertheless, a forthcoming ILO paper <sup>7</sup> takes a more cautious view. While it acknowledges that new technologies have numerous potential benefits, including streamlined just-in-time production, reduced inventories and waste, reduced transport costs and delivery times, improved product quality, reduced reputational risks and improved brand image, he concludes that it remains to be seen whether the technologies can overcome the competitive advantage of developing countries with lower labour and production costs.

A likely scenario for the industries is that low-cost, low-tech production in developing countries will co-exist with a steady growth in the design and application of robotics and automation in middle- and high-income countries closer to or within the largest markets. Middle-income countries, such as China, which have built industrial capabilities and invested in new technologies, should be able to continue production of TCLF on the basis of a combination of relatively low labour costs with high-tech production methods.

### **2.1.2. Digitalization**

Digitalization is likely to have an even greater impact on the industries in the decades to come. Technologies such as radio-frequency ID (RFID) tags, sensors and the Internet of Things, coupled with new software, augmented virtual reality (AVR), blockchains and artificial intelligence (AI), are expected to cause considerable disruption. Digitalization will shape how products are designed, how supply chains are managed, how and where production takes place, how logistics systems are automated and run, and how products are marketed, sold and delivered to the consumer (Figure 1).

<sup>7</sup> D. Kucera, op. cit.

**Figure 1: Potential application and use of digital technologies**

Digital technologies have the potential to –

<b>Market intelligence</b>	<p>Help brands analyse and understand millions of data points about current market trends (AI)</p> <p>Enable brands to pick out micro trends in what is being purchased and where (AI)</p> <p>Allow a brand to analyse data from RFID tags and sensors sewn into garments to learn about actual consumer use and properties of the materials used (RFID, sensors, AI)</p>
<b>Design</b>	<p>Help designers forecast projected demand for new products (AI)</p> <p>Allow designers and consumers to see how designs will look in real-life situations (AVR)</p> <p>Help designers classify and better pick colours and avoid mistakes (new software)</p> <p>Assist producers in tailor-making designs to individual body sizes and shapes using software that detects contours and body shapes (new software)</p>
<b>Materials</b>	<p>Help manufacturers predict the mechanical properties of a garment (RFID, sensors)</p> <p>Assist in classifying and grading garments and in identifying and analysing faults (AVR, new software)</p> <p>Help manufactures with future decisions on the best raw materials suppliers and fabrics to use (AI)</p>
<b>Suppliers &amp; logistics</b>	<p>Assist brands and manufacturers in better supply chain management and just-in-time production (RFID, sensors, Internet of Things, AI, blockchains)</p> <p>Improve logistics management, reduce delays in production and overcapacity (RFID, sensors, Internet of Things, AI, blockchains)</p> <p>Help buyers and suppliers to make and account for payments (blockchains)</p>
<b>Production</b>	<p>Assist manufacturers in production planning and control and online monitoring (RFID, sensors, Internet of Things, AI, blockchains)</p> <p>Help manufacturers optimize spreading, cutting, bundling, sewing, pressing and packaging and other processes (RFID, sensors, Internet of Things, AI, blockchains)</p> <p>Assist brands and buyers in monitoring working conditions (e.g., hours and overtime), occupational safety and health (e.g., noise, dust, heat, air quality) and environmental performance (RFID, sensors, Internet of Things, AI, blockchains)</p>
<b>Marketing</b>	<p>Assist brands in better targeting specific consumer categories and groups (new software, AI)</p> <p>Allow brands to better use social media to engage and interact with customers (new software, AVR, AI)</p> <p>Allow brands and retailers to influence buying behaviours of consumers (new software, AI)</p>
<b>Retail</b>	<p>Help a brand understand how consumers shop, when, and through which channels (RFID, sensors, AI)</p> <p>Allow a brand to better understand how consumers interact with clothing in-store (RFID, sensors, AI, blockchains)</p> <p>Help retailers sell additional items through personalized offers based on items already purchased (AI, new software, blockchains)</p>
<b>Customer service</b>	<p>Respond to enquiries immediately using chatbots (AI)</p> <p>Improving the shopping experience through AI shopping assistants that offer conversation products and services (AI)</p> <p>Provide customers with suggestions according to their recorded needs or their recent product searches (AI)</p>

Source: ILO, SECTOR

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Several brands and buyers are already using digital technologies, including Amazon, American Apparel, ASOS, Burberry, Dior, GAP, Google Shopping Actions, Tommy Hilfiger and Zara.<sup>8</sup> The adoption and use of digital technologies have so far been driven by a race to increase sales by offering more personalized products and services. The disruption that platform companies in particular will have on retail as well as on purchasing practices, cut-throat competition for orders, and pressure on firms in the supply chains is becoming increasingly significant.

Moreover, the number of potential applications of digitalization and related cost-savings across the supply chain is enormous, particularly as the use of robotics and automated end-to-end production systems increases. The experience of the Li & Fung Group, which has 15,000 suppliers in around 60 countries around the world and over 8,000 customers in more than 100 countries, is that digitalization can improve the speed at which a product reaches the consumer by several months, help delay buying decisions, and reduce inventories.<sup>9</sup>

At the same time, new software and AI will only ever be as powerful as the data that are generated and made available. While there are exceptions, very few manufacturers and brands currently use digital technology to trace and track the flow of raw materials from the place they are sourced to the shop or platform where the final product is sold. While this may change in the future with the uptake of RFID tags and sensors, there are two key reasons why progress is likely to be uneven. First, there are currently no industry standards for the use of digital data and technology. Secondly, concerns about worker and customer privacy are likely to limit the data that brands and manufacturers will be allowed to access and use to increase sales and monitor productivity and working conditions in factories.

### **2.1.3. New materials**

New materials are being developed to replace or complement existing resource-intensive raw materials (e.g., fibres made from bamboo, orange trees), improve performance (e.g., help regulate body temperature, reduce wind resistance, control odours and muscle vibration), connect the users with web applications, enhance aesthetics (e.g., fabrics that can change colour or light up according to the mood of the user), and protect the wearer against radiation, dry skin or ageing (e.g., drug releasing materials or fabrics with moisturizers, perfume and anti-ageing properties).<sup>10</sup> Revenues in the smart textile industry grew from \$700 million in 2012 to 1.76 billion in 2017.<sup>11</sup>

These innovations are driven by a revolution in materials science and research. Among them are innovative ways to recycle materials, artificially engineered nanomaterials, including cotton-blend fabrics that kill bacteria or conduct electricity, ultra-thin silicon

<sup>8</sup> Textiles Intelligence: “Textile Outlook International – Business and market analysis for the global textile and apparel industries”, in *Textile Outlook International* (2018, No. 192, July).

<sup>9</sup> R. Michelle: “Li & Fung’s ‘shot at the moon’ approach to digitalisation”, in *Just-style* (2018, May).

<sup>10</sup> R. Geddis: “What Is the Future of Fabric? These Smart Textiles Will Blow Your Mind”, in *Forbes* (2014, 27, May).

<sup>11</sup> Hexa Report: *Global Smart Fabrics and Textiles Industry 2017 Market Research Report* (QYResearch, 2017).

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circuits, which could lead to high-performance medical and communication instruments that can be worn, and even metamaterials that make whatever they cover undetectable.

New materials and product innovation in the industries are mostly driven by large multinational enterprises in partnerships with small start-ups and supported by governments in countries such as Denmark, Germany, Republic of Korea, Taiwan and the United States, in order to retain their competitiveness in the global market. LAUNCH NORDIC is an example of a partnership that has brought together government entities<sup>12</sup> and large brands (such as IKEA Group, Nike and Novozymes) with the goal of accelerating innovation in sustainable materials.<sup>13</sup> Re:newcell, a start-up company supported by LAUNCH NORDIC, has found new ways of turning used cotton and viscose into biodegradable fibres, yarn and fabrics, and Qmilk has developed a technology to convert unused milk into a silk-like, biodegradable fabric.<sup>14</sup>

These examples highlight how much of the innovation in TCLF materials is driven by growing concerns over the negative impact of the industries on the environment (see section 2.3 below). The case of leather, however, demonstrates how the search for replacement materials can be complicated. Because of concerns about animal welfare and the environment, many leading brands initially replaced genuine leather with synthetic leather. However, the two most commonly used plastics to replace leather – polyvinyl chloride (PVC) and polyurethane – are also two of the most toxic and are known to end up in the environment as non-degradable waste products. Hence, new research has been launched to explore other alternatives such as cork, mushroom, pineapple, grape, and lab-grown leather.

Whether driven by consumer aesthetics or ethics, innovations in materials have the potential to reduce the environmental impact of the industries and to expand the range of inputs for new and innovative products. What is less clear is whether the growing use of new materials will decrease demand for natural leather and cotton, and what the impact on employment in leather and cotton-producing countries will be.

Coupled with automation, robotics and digital technologies, new materials and other technological advances no doubt have the potential to change the industries in profound ways, with both opportunities and challenges for enterprises of all sizes in all countries, as well as for all workers in the industries.<sup>15</sup> What is not yet known is how quickly such technologies – and others not yet invented – will change the industries, how widespread the uptake will be, and what the consequences and impact will be for specific groups of firms and workers in different countries and in different parts of TCLF supply chains. If the history of the textile industry is a guide, the adoption of new technologies is likely to be uneven and could take longer than expected. While the introduction of the electric motor in the 1880s

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<sup>12</sup> Including the US Department of State, the US Agency for International Development (USAID), NASA, the Danish Ministry of Foreign Affairs, the Danish Environmental Protection Agency and Region Skåne.

<sup>13</sup> J. Mowbray: “New technique chemically recycles polyester”, in *Ecotextile* (2016, October).

<sup>14</sup> Nordic textile Challenge Statement, Launch, 2014, <https://www.launch.org/circular/textiles/> [accessed 19 September 2018]; J. Mowbray: “Further €5M for Swedish closed loop textile project”, in *Ecotextile* (2016, September).

<sup>15</sup> B. Leonie: “Outlook 2018 – What next for apparel sourcing?”, in *Just-style* (2018, January).

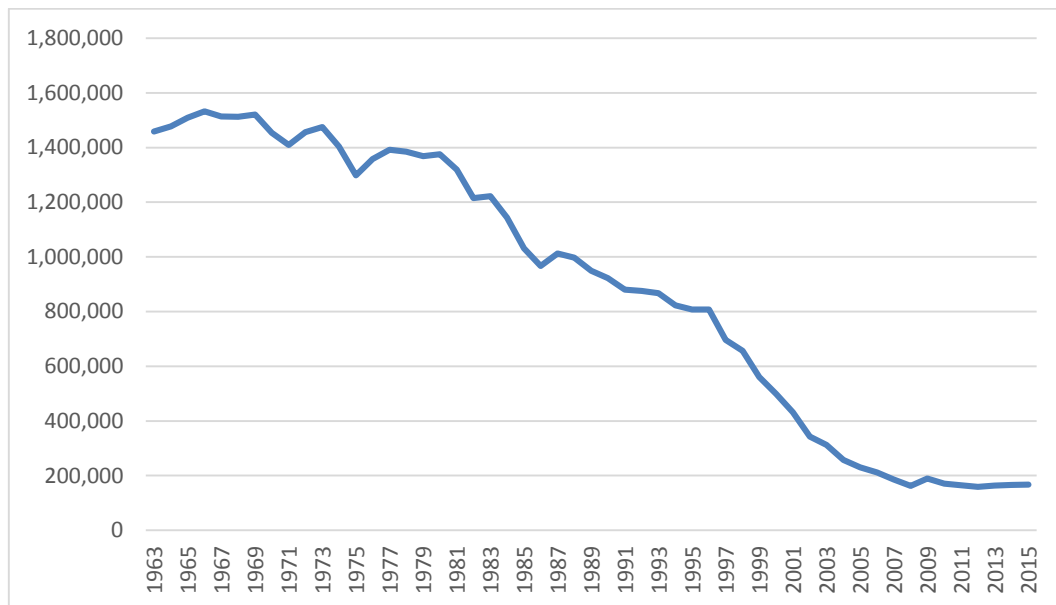
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disrupted and decentralized the mass production of textiles, it took at least four decades before the last, large steam-powered textile mill closed.

## 2.2. Globalization

Globalization has underpinned the current model of production and consumption of TCLF and has brought about substantial changes in where and how products are manufactured and consumed. The offshoring and outsourcing model that emerged with trade liberalization, and expanded with the end of the textile quota system in 2005,<sup>16</sup> resulted in rapid growth in the industry in Asia and other parts of the developing world. At the same time, Europe and North America experienced significant employment losses (Figure 2), and concerns about working conditions in global supply chains have persisted.<sup>17</sup>

**Figure 2: Formal employees in the US apparel and footwear industry (1963-2015)**



*Source:* UNIDO, INSTAT2, 2017, in Kucera, D., *Robotics and Reshoring: The Apparel and Footwear Industry* (Geneva, ILO, forthcoming).

Today, there are signs that a new era of globalization is emerging, one that maintains considerable momentum but is qualified by uncertainty in the geopolitical and trade climate. Along with a general slowdown of trade in manufactured goods, world textile and apparel trade is decelerating.<sup>18</sup> While there are many reasons for this trend, including exchange rate

<sup>16</sup> The Multi-Fibre Arrangement (MFA) regulated the sector from 1974 to 2005, imposing quotas on the amount of traded goods that could be exported from developing to developed countries.

<sup>17</sup> ILO: [Decent work in global supply chains](#), Report IV, International Labour Conference, 105th Session, Geneva, 2016.

<sup>18</sup> S. Lu: “5 key trends in world textile and apparel trade”, in *Just-style* (2017, December).

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fluctuations, rising protectionism and the underlying structural adjustment in the industries are contributing factors.

The new era of globalization is likely to affect the industries in different countries in different ways, with both winners and losers emerging. China's role as the world's leading exporter of TCLF (Box 2) depends on the future of the world's increasingly fragile and volatile trading system, and particularly on China-United States trade relations. It remains to be seen whether China's extensive and expanding network of free trade agreements with other countries will help increase demand for Chinese textiles and clothing in other key markets.<sup>19</sup> Smaller clothing and footwear producing countries without such networks are much more vulnerable to protectionism and trade wars.

**Box 2: The changing role of China**

With China's economic reforms in the 1980s and its accession to the World Trade Organization in 2001, the country has grown to be, by far, the world's largest producer and exporter of textiles and clothing. In 2015 it accounted for 38.4 per cent of global apparel exports, far ahead of Bangladesh with a 5.9 per cent share.

Chinese textile and clothing exports increased by 1.5 per cent, from US\$ 254,948 million in 2016 to US\$ 258,867 million in 2017, and China remains the leading exporter to Canada, the EU, Japan, and the US. However, trends suggest that China's share of combined imports in these four markets is unlikely to grow substantially in the years to come. Furthermore, China appears to be on the verge of significant industrial restructuring. Rising labour and production costs have already led to a steady shift in production to lower cost suppliers in a number of other countries – including Bangladesh, Cambodia, Haiti, Myanmar, Nicaragua and Viet Nam, and most recently to Ethiopia and other African countries – and this is expected to continue.

Nevertheless, China is likely to remain a powerhouse in the sector, not only because of its growing domestic market, but also because of its increasingly important role as a supplier to other TCLF exporting countries in Asia: Bangladesh's imports of textiles from China grew from 39 per cent in 2005 to 47 per cent in 2015.

*Source:* Textiles Intelligence: "Business and market analysis for the global textile and apparel industries", in *Textile Outlook International* (2017, No.187, August), pp. 4-5.; B., Leonie: "Outlook 2018 – What next for apparel sourcing?", in *Just-style* (2018, January).

Asian countries dominate world textile and apparel exports, and are likely continue to do so in the coming years. Sixty-two per cent of textile exports came from Asian countries in 2016, up from 48 per cent a decade earlier.<sup>20</sup> At the same time, trade in TCLF is increasingly determined by regional supply chains in Asia, Europe, and the Americas. Within these regional supply chains, advanced economies generally supply textiles, materials and designs to firms in low-cost countries, which in turn export clothing and footwear to mass major markets around the world. In recent years, however, Africa has emerged as a new destination for the footloose TCLF industries. The growth of the African textile industries is spurred by its cotton production and markets, low labour and production

<sup>19</sup> China has free trade agreements in force with countries of the Association of Southeast Asian Nations (ASEAN), comprising Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand and Viet Nam, and with Australia, Chile, New Zealand, Pakistan, Peru, and the Republic of Korea. It is currently negotiating a trilateral trade deal with the Republic of Korea and Japan, and is pursuing the formation of a new economic trade area called the Regional Comprehensive Economic Partnership (RCEP), which would cover all ten ASEAN nations as well as Australia, China, India, Japan, New Zealand and the Republic of Korea. With the decision of the US to withdraw from the Trans-Pacific Partnership (TPP) free trade agreement, the RCEP would enable China to set the rules for international trade for many years to come.

<sup>20</sup> *Just Style*, op. cit.

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costs, growing domestic demand as well as trade agreements such as the African Growth and Opportunity Act, the trade agreement between the United States and sub-Saharan Africa.

In this regard, it is noteworthy that many Asian manufacturers have grown into multinational enterprises and are playing a crucial role in increasingly complex global supply chains, with Asian companies investing in operations not only in Asia, but also in Africa and Central America. These global conglomerates are generally focused on manufacturing, serving as subcontractors for brands and buyers, but some have also successfully launched their own brands.<sup>21</sup>

TCLF trade and supply chains are likely to change even further and more dramatically in the decades to come. Omni-channel fashion markets – where production and delivery cycles are measured in days rather than in weeks<sup>22</sup> – are already forcing brands to re-examine their existing lean supply chain methodologies in favour of re- or nearshoring and other approaches that are more fluid, more flexible, directed at all channels, and supported by digitalization and other technological advances in order to offer consumers a seamless, integrated experience.<sup>23</sup>

Whereas the new era of globalization comes with great uncertainties, it remains highly likely that the rapid and profound changes will benefit some companies and workers, and cause great disruption for others. The question of how the poorest and most economically vulnerable countries can improve the competitiveness of their TCLF exports and use the textile and clothing industry to drive industrialization, economic growth, and decent work will remain a tough and urgent question in the years to come.

### 2.3. Climate change

Climate change is expected to have wide-ranging effects throughout TCLF supply chains. Cotton production in tropical regions of the world, for instance, will suffer from a combination of rising temperatures, decreased soil moisture, water shortages and increased frequency of extreme weather events and flooding.<sup>24</sup> Meanwhile, flooding has already caused significant disruption and economic losses to manufacturing firms in Bangladesh, and is likely to continue to threaten the industry as water levels rise. Furthermore, it is expected that rising temperatures will have a severe impact on occupational safety and health

<sup>21</sup> *ibid.*

<sup>22</sup> Textiles Intelligence: “Business and market analysis for the global textile and apparel industries”, in *Textile Outlook International* (2018, No 192, July).

<sup>23</sup> A. Berg et al.: The apparel sourcing caravan’s next stop: digitization: McKinsey Apparel CPO Survey 2017 (McKinsey Apparel, Fashion & Luxury Group, 2017).

<sup>24</sup> P. Ton (ed.): Cotton and climate change impacts and options to mitigate and adapt (Geneva, ITC, 2011).

as well as on productivity,<sup>25</sup> particularly in the least developed countries mostly affected by climate change.<sup>26</sup>

While the effects of a changing climate are beginning to affect the industries, it is arguably governments' green growth policies, consumers' demands for sustainability,<sup>27</sup> and civil society organizations' concerns about the environmental footprint of the industries (Figure 3) that have so far spurred the greatest action among brands, manufacturers, and producers of raw materials to adopt new technologies, business models and production processes to protect the environment and limit the industries' contribution to global warming and its related effects.

**Figure 3: Current and future footprint of the textiles industry**



Source: Ellen MacArthur Foundation, *A new textiles economy: Redesigning fashion's future* (2017).

<sup>25</sup> ILO: *Greening with jobs: World Employment and Social Outlook*, Report examines environmental sustainability in the world of work. It focuses on how climate change and environmental degradation will impact the labour markets, affecting both the volume and quality of employment, and quantifies the shifts expected to take place within and between sectors, International Labour Office (Geneva, 2018).

<sup>26</sup> According to IPCC's 5th Assessment Report, the global economic cost of reduced productivity could reach over 2 trillion dollars by 2030. UNDP & others: *Climate Change and Labour: Impact of Heat in the Workplace*. April 2016.

<sup>27</sup> I. Amed et al.: *The State of Fashion 2019* (McKinsey analysis, 2018).



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These include organic cotton production; drip-irrigation cotton growing; the use of hemp, bamboo and other replacement materials or recycled cotton to reduce cotton use; the use of replacement materials;<sup>28</sup> the introducing of dyeing processes using no or little water; investment in resource efficient washing; reduction and regulation of chemicals use; introduction of less resource-intensive machinery; using solar panels or other renewable sources to power factories with clean energy; and avoiding high volumes of wasted, unsold stocks.

To assist firms in measuring and evaluating their impact and dependencies on the natural resources needed for TCLF production, the Natural Capital Coalition has developed an Apparel Sector Guide to its Natural Capital Protocol.<sup>29</sup> The Guide will allow investors, brands and companies to better understand the risks and true cost of the industries' impact on the environment, which in turn should spur innovative business models and increased investments in clean energy and resource-intensive equipment in the future.

Nevertheless, these approaches and production processes can be costly to develop and implement, especially for developing countries and for small and medium-sized enterprises (SMEs), which is reflected in the relatively slow uptake of green and clean technology and business models in the industries to date. So far, initiatives to green TCLF production have mostly been supported by European governments and implemented by leading brands and buyers, and while these have shown promise and potential, they have yet to be brought to scale. At the current rate, it will take many years before the TCLF industries move to a circular economy approach (Box 3) and become truly sustainable.

**Box 3: Towards a new circular TCLF economy**

In 2017, the Ellen MacArthur Foundation launched the Circular Fibre initiative together with H&M, Nike and Lenzing and other key stakeholders to bring a circular economy approach to scale in the textile industry. In a report from 2017, the Foundation argues that the current linear "take-make-use-dispose" model of consumption and production is potentially catastrophic, but that greater sustainability can be achieved through longer-lasting designs as well as greater maintenance repair, reuse, remanufacturing, refurbishing, and recycling. The initiative specifically calls for: (i) the phasing out of microfibre plastics and other substances of concern; (ii) increased clothing utilization; (iii) improved recycling by transforming clothing design, collection, and reprocessing; and (iv) for more effective use of resources and a move to renewable inputs.

*Source:* Ellen MacArthur Foundation, *A new textiles economy: Redesigning fashion's future* (2017).

## 2.4. Demographics

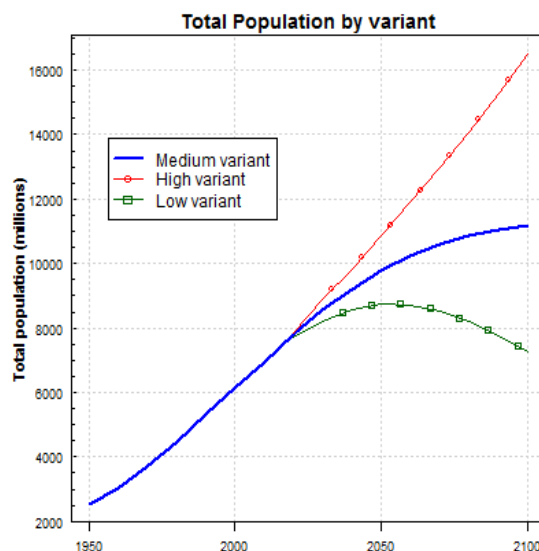
Shifting demographics will continue to drive changes in the industries in the future. This includes but is not limited to: a growth in the global population, an increase in the number of female and male middle-class consumers, a transformation in the age structure across regions and countries, and changes in consumer preferences and demand.

<sup>28</sup> Textiles Intelligence: "Biodegradability, hybrids and recycling: routes to sustainability in fibre, textile and apparel industry?", in *Textile Outlook International* (2016, No. 182, November).

<sup>29</sup> Natural Capital Coalition: *Apparel Sector Guide* (Natural Capital Protocol, 2016).

In 2017 the United Nations estimated that the global population will reach 8.6 billion in 2030, and almost 10 billion by 2050 (Figure 4).<sup>30</sup> Furthermore, the majority of this growth is expected to take place in just nine countries: with the exception of the United States, all are developing or emerging countries.<sup>31</sup>

**Figure 4: Global population growth by variant**



Source: United Nations Department of Economic and Social Affairs. *World Population Prospects: The 2017 Revision*.

The OECD projects that population and economic growth will lead to a growing global middle class, which could reach 3.2 billion by 2020 and 4.9 billion by 2030.<sup>32</sup> As hundreds of millions of new consumers join the global middle class each year, overall demand for TCLF is likely to increase significantly.

However, the rate of global population growth is expected to slow by the end of the 21st century as a result of lower fertility rates in all regions (Figure 5). This will eventually have an impact on the age structure of the world's population. An ageing population in almost all regions will in the long term limit potential growth in global demand for TCLF.<sup>33</sup>

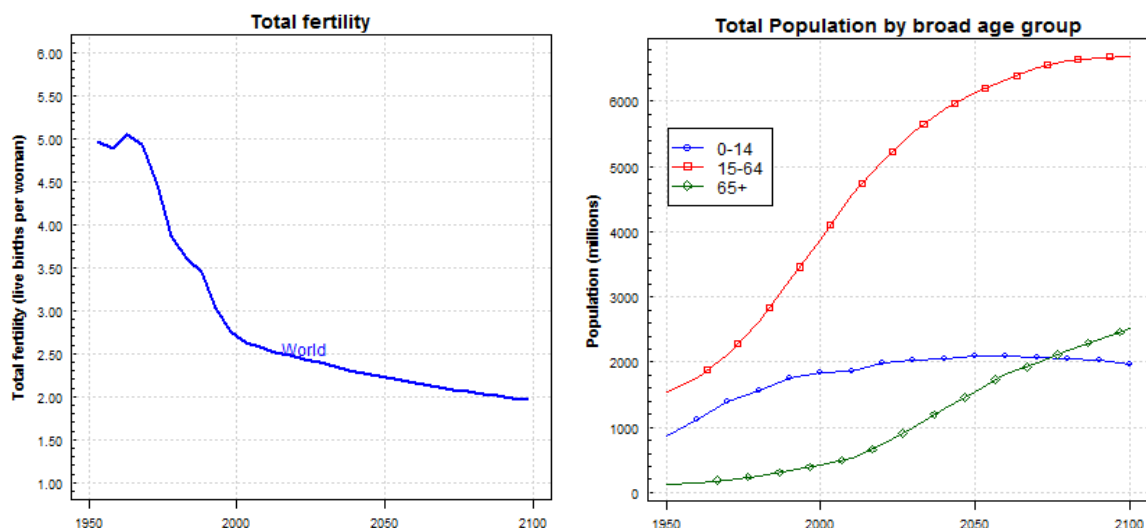
<sup>30</sup> United Nations: *World Population Prospects: Key Findings and Advance Tables* (New York, Department of Economic and Social Affairs: Population Division, 2017)

<sup>31</sup> India, Nigeria, Democratic Republic of the Congo, Pakistan, Ethiopia, United Republic of Tanzania, United States, Uganda, and Indonesia (in order of expected contribution to global population growth).

<sup>32</sup> OECD: *The future of global value chains: Business as usual or a "new normal"?* (Paris, OECD publishing, No. 41, 2017).

<sup>33</sup> United Nations, op. cit.

**Figure 5: Total fertility and total population growth by age group**



Source: United Nations Department of Economic and Social Affairs: *World Population Prospects: The 2017 Revision*.

While fertility rates have been declining at a global level, including in Africa, it is estimated that Africa’s share of the global population will increase to 25 per cent by 2050.<sup>34</sup> Brands, manufacturers and retailers have already started to invest in the region with the long-term objective of meeting growing demand for TCLF, while also benefiting from relatively low production and labour costs (Box 4).

**Box 4: Demographic shifts and labour supply**

Demographic shifts will also have an impact on labour supply in the industries, which have traditionally employed young women and migrants.

TCLF manufacturing is currently taking place in countries with young populations. The increase in new labour market entrants each year in TCLF producing countries such as Bangladesh, Ethiopia, Indonesia and Pakistan means that there will be a steady supply of young, female, low-skilled, low-cost labour to the industries in the short- to medium term.

At the same time, the average age of the agricultural workforce is increasing in key cotton producing countries. This is either because of an aging population in cotton producing countries like Australia and China, or driven by large-scale rural to urban migration in countries like India and Pakistan.

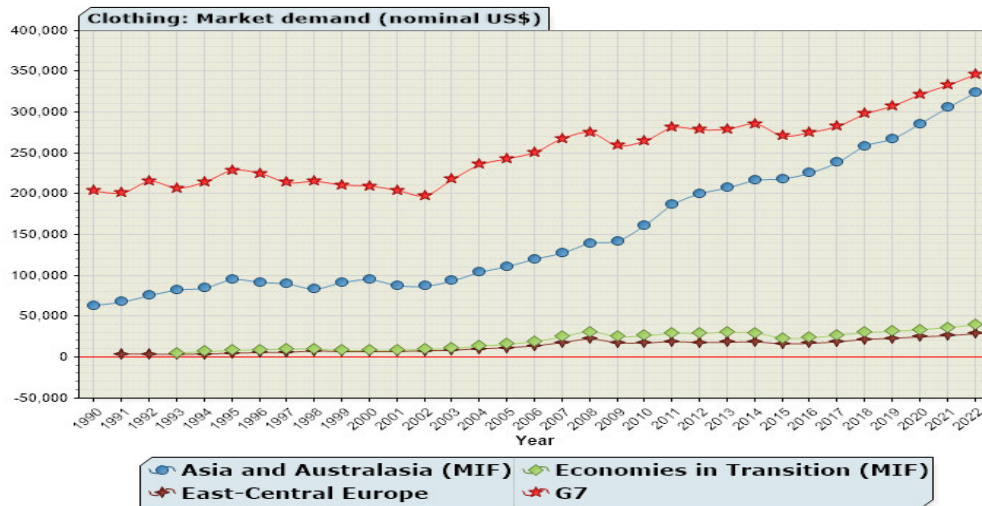
In the long term, an ageing population in all regions and greater demand for higher skilled workers to operate automated and digitalized TCLF supply chains could lead to skills shortages. In the meantime, it will not be a lack of labour supply that prevents the low-cost, low-skill production model from co-existing with a more technologically advanced manufacturing model.

In the short to medium term, demand for clothing is forecast to grow fastest in Asia and in the Group of Seven (G7) countries of Canada, France, Germany, Italy, Japan, the United Kingdom, and the United States, which represent more than 62 per cent of global net wealth

<sup>34</sup> United Nations, op. cit.

(Figure 6).<sup>35</sup> In Asia the rapidly growing demand for clothing is predicted to increase sales by 6 per cent each year, and it is estimated that the region will account for about 40 per cent of global sales by 2025.<sup>36</sup> This is already changing the global pattern of trade and destinations of exports. Many Chinese manufactures have already started to produce for domestic and regional markets in Asia.

**Figure 6: The growing demand for clothing in Asia and Australasia**



Source: Economist Intelligence Unit.

What is not yet clear is how the projected increase in demand across different regions will be fulfilled – through continued mass manufacturing or a shift towards more sustainable production and consumption. Significant changes have been observed in terms of consumer preferences, fashion and brand loyalty, particularly among younger consumers and in the European Union and North America, with increased demand for clothing made of natural and organic materials. There has been a growth in sales of second-hand materials, reselling markets, and vintage fashion, as well as increased use of clothing rental and sharing platforms and innovative models of recycling.

In the TCLF industries, the customer has always come first. Hence, the choices that new generations of consumers make and the way they shop in coming decades are likely to have a significant impact on the organization of work and on the growth and sustainability of the industries in the future.<sup>37</sup>

<sup>35</sup> M. Hallward-Driemeier and G. Nayyar: *Trouble in the Making? The Future of Manufacturing-Led Development*. (Washington DC, World Bank Publications, 2017).

<sup>36</sup> J. Andersson et al.: *Is apparel manufacturing coming home? Nearshoring, automation, and sustainability – establishing a demand-focused apparel value chain* (McKinsey & Company, 2018).

<sup>37</sup> *Trend report: Future of sustainable fashion, Sustainable Brands, 2017*, [https://www.sustainablebrands.com/digital\\_learning/research\\_report/products\\_design/trend\\_report\\_future\\_sustainable\\_fashion](https://www.sustainablebrands.com/digital_learning/research_report/products_design/trend_report_future_sustainable_fashion) [accessed 19 September 2018].

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### 3. Challenges and opportunities for decent work

The industries' contribution to economic growth, industrialization, exports, employment and livelihoods has in most countries coexisted with concerns about, inter alia, poor working conditions, unsafe workplaces, violence at work, gender inequality, child and forced labour, and an absence of freedom of association and social dialogue. These decent work deficits continue to characterize the industries today and are not likely to be resolved from one day to the next. However, technological advances, globalization, demographic shifts and climate change will bring about both new challenges and opportunities, which will have wide-ranging impacts on decent work in the future – be it in terms of employment, social protection, rights at work, or social dialogue.

#### 3.1. Employment

##### 3.1.1. Job creation, job losses and job transformation

The megatrends and drivers identified in Chapter 2 are likely to affect the number and types of jobs in the industries in the future in different ways. On the one hand, population growth, an increase in the number of middle class consumers, and globalization are likely to generate increased global demand for TCLF and additional opportunities for enterprises of all sizes to expand production and create new jobs. On the other hand, automation, robotics, and digitalization have the potential to cause significant job losses across the supply chain, from cotton production to retail.

A 2016 ILO study concluded that “Significant shares of TCF [textile, clothing and footwear] workers in ASEAN are at high risk of automation, from 64 per cent in Indonesia, to 86 per cent in Viet Nam and 88 per cent in Cambodia.”<sup>38</sup> These findings were based on a methodology developed by Frey and Osbourne, who estimated that 47 per cent of all employment across economic sectors could be at risk of computerization, sparking considerable debate on the extent of the risk of automation to employment.<sup>39</sup> In the TCLF industries such losses would probably first occur in emerging economies on the verge of industrial restructuring, where rising labour costs would make investments in sewbots and automation particularly attractive.

Nevertheless, while the potential exists for certain tasks to be automated or digitalized, TCLF work might not necessarily be taken over by robots or algorithms: while certain tasks in an occupation might be automated, others might remain or evolve, rather than become obsolete. A 2016 study by the Organisation for Economic Co-operation and Development (OECD) suggests that the risk of complete automation of jobs is likely to be far lower than estimated by Frey and Osborne. Even though a significant share of tasks within occupations

<sup>38</sup> ILO: *ASEAN in Transformation: Textiles, Clothing and Footwear: Refashioning the Future*, op. cit.

<sup>39</sup> C. B. Frey and M. A. Osborne: “The future of employment: how susceptible are jobs to computerisation?” in *Technological Forecasting and Social Change* (London, Oxford, 2017).

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(between 50 and 70 per cent) could be threatened, only 9 per cent of jobs in OECD countries were projected to be automatable.<sup>40</sup>

Moreover, investments in new task-replacing technologies are generally made where investors believe them to be at least as profitable as investing in the prevailing model of low-cost labour in the sector and to have a similar or lower risk profile. In this regard, it should be noted that incentives for investments in robotics, automation and digitalization differ depending on where a firm is situated in the global supply chain. Leading brands and buyers, for instance, are well-positioned to make investments in digitalization for improved supply chain management and establishing new digital sales channels. By comparison, supplier firms in the first, second and third tiers of the supply chain are restrained by a lack of access to capital and information about technologies and markets, which in most cases are prerequisites for undertaking large-scale investments in robotics and automation to optimize production.<sup>41</sup>

Geography matters too. It has traditionally proven challenging for least developed countries without modern infrastructure, a robust investment climate, or strong labour markets institutions to attract foreign direct investment into their nascent industries. By comparison, start-up companies in OECD countries operate in relatively stable macro-economic frameworks with predictable industrial policies, and benefit from easier access to finance, markets and the latest and most advanced technologies in partnerships with universities and other companies in dedicated science parks.

### **3.1.2. Small and medium-sized enterprises**

SMEs are a major engine of job creation and innovation. They are strategically important to the creation of decent and productive work in the industries in the future, and to adapting to the megatrends and drivers identified in Chapter 1. SMEs can empower and generate jobs for youth, particularly for women, as demonstrated by initiatives such as the African Development Bank's Fashionomics Africa Masterclass, which has trained and helped entrepreneurs and designers to create their own TCLF businesses in Nigeria, South Africa, and Ethiopia.<sup>42</sup>

Compared to automotives, chemicals or electronics, for instance, the TCLF industries comprise a large proportion of SMEs, primarily due to the relatively low start-up costs associated with entering the industry. Operating in increasingly complex supply chains, the number and characteristics of SMEs in the industries have grown ever more diverse, from small garment factory owners or individuals hired to make or design clothing, to high-tech start-up companies. The trend towards customization of TCLF, as opposed to standardized mass production, and the increased use of new technologies and materials could provide new opportunities for SMEs in the industries to become more profitable, productive, inclusive and sustainable (Box 5). SMEs may be able to adopt smaller-scale robotics like 3D printers and digital technologies at a relatively low cost compared to traditional industrial automation technology with high barriers to entry.

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<sup>40</sup> M. Arntz et al.: *The risk of automation for jobs in OECD countries: A comparative analysis*, OECD Social, Employment and Migration Working Papers (Paris, OECD, Social, Employment and Migration Working papers No. 189, 2016).

<sup>41</sup> D. Kucera, op. cit.

<sup>42</sup> *Textile and Clothing industries can drive Africa's industrialization, benefit women*, African Development Bank Group, 2018, <https://www.afdb.org/en/news-and-events/textile-and-clothing-industries-can-drive-africas-industrialization-benefit-women-18427/> [accessed 19 September 2018].

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#### **Box 5. Adapting to a new production paradigm with SCORE assistance**

The ready-made garment enterprise Marina Atelier SAC, based in Peru, has benefited from ILO SCORE (Sustaining Competitive and Responsible Enterprises) training and technical assistance to better cope with the introduction of new digital technologies and production processes. In addition to the introduction of 3D scanners and new design software, the company has introduced measures to make production more sustainable (e.g., waste reduction, sustainable packaging, use of rainwater) and new policies to promote gender equality, non-discrimination, and non-violence. This has led to increased productivity, empowerment of workers, and improvement of the working environment.

*Source: The Transition to the Future of Work with ILO's SCORE Training.* ILO, Enterprise, 2018, [https://www.ilo.org/empent/Projects/score/WCMS\\_647821/lang--en/index.htm](https://www.ilo.org/empent/Projects/score/WCMS_647821/lang--en/index.htm) [accessed 18 December 2018].

To ensure that SMEs continue to provide workers with decent and productive jobs in the future, governments will require well-designed and inclusive SME policies in alignment with national circumstances. Such policies should increasingly focus on enhancing capabilities to innovate and adopt new technologies and to develop new products in order to address social, economic, and environmental goals. Action is needed by governments, in collaboration with employers and workers, to foster an enabling environment for SMEs in the industries in the future, including but not limited to: simplifying often complex regulations for SMEs; improving access to finance through measures such as loan guarantees and start-up grants; clustering, networking, linking into technology platforms, supply chains and local economic development; addressing decent work challenges in the industries; public investment in infrastructure, education, training and technology; and supporting the formalization of SMEs.<sup>43</sup>

### **3.1.3. Skills and human resource development**

New skills are and will increasingly be required across the entire TCLF supply chain, not only in relation to new production processes, but also in areas such as design, finance, product development, logistics, marketing, sales and customer service. Workers trained in ICT and science, technology, engineering, and mathematics (STEM) disciplines will be in particularly high demand across all industries in all countries. In the ASEAN region, for example, there is currently a shortage of technicians and engineers who can operate, service and maintain new technologies and robotics.<sup>44</sup>

In the future it will become increasingly important to manage skills development and skill shortages in order to ensure that employers and workers are able to adapt to new technologies, new materials and growing pressure to manufacture products in an environmentally sustainable way. The lack of a highly skilled and trained workforce, able to operate robotics and digital technologies, could slow the rate of automation in the industries disproportionately.

Employers will increasingly require workers to be equipped with the appropriate skills to operate new technologies for efficient and sustainable production in order to attract investment and boost profitability. Alongside training new workers, this will increasingly

<sup>43</sup> ILO: [Resolution concerning small and medium-sized enterprises and decent and productive employment creation](#), International Labour Conference, 104th Session, Geneva, 2015.

<sup>44</sup> ILO: *ASEAN in Transformation – The Future of Jobs at Risk of Transformation*, op. cit.

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mean re-skilling and up-skilling existing workers through life-long learning. For workers, education and training will become increasingly essential to secure employment in the TCLF industries, or to find employment in other sectors if the industries decline in their country. Special attention should be given to those working in the TCLF industries today, the young women and migrants that tend to have a low level of education and are locked in low-paid production line work without the opportunity to progress into management or supervisory roles.<sup>45</sup> Governments, employers and workers in the industry will have to adopt sustainable, integrated approaches to provide both women and men with the necessary life-long training to maintain a competitive advantage in the industry, whether in developed, emerging or developing countries, and to reskill workers in countries or segments of the supply chain where the industries decline. This will require a complete change of mindset in industries that for decades have thrived on the abundance of low-skilled workers and rudimentary low-cost technologies. It will also require a radical overhaul of education and training systems, coupled with significantly increased investments in human resources development for the millions of mostly young women and men that work in the TCLF industries today.

### **3.2. Fundamental principles and rights at work**

While the environmental sustainability of the industries is a growing concern, labour rights abuses continue to dominate reports and news articles about these industries. Partnerships like the ILO-IFC Better Work programme have proven that safe, dignified work means more productive factories, and a more profitable business model that benefits workers, managers, countries, and consumers alike.<sup>46</sup> But as the industries move into new low-cost countries with limited capacity to implement laws and regulations, and with the pressure on profitability, working hours and wages that new technologies bring, there is a high risk that fundamental principles and rights at work will remain a distant aspiration for many employers and workers.

The growing number of young unskilled women and men in the industries in developing countries is likely to lead to an increasing proportion of vulnerable workers in the industries in the future. In countries and segments of the supply chains where rapid changes will lead to serious disruption, it is critical to ensure that all groups of workers have equal access to training and to social security, and are able to realize their rights at work and join representative workers' organizations so that their voice can be heard. However, this will become a harder goal to achieve if informality, home-based work, and non-standard forms of employment continue to prevail in the second, third and fourth tiers of the industries' global supply chains.

For the same reasons, child labour is likely to remain an issue in lower tiers of global supply chains, especially in countries without effective implementation and enforcement of national labour laws or of fundamental principles and rights at work and other international labour standards. With an increasing number of migrants and refugees entering the industries, and in the absence of fair recruitment practices, cases of bonded and forced labour will continue to occur, unless governments, employers and workers take concerted action to address this critical issue.

<sup>45</sup> ILO: [\*Progress and potential: How Better Work is improving garment workers' lives and boosting factory competitiveness: A summary of an independent assessment of the Better Work programme\*](#), ILO Better Work (Geneva, 2016).

<sup>46</sup> *ibid.* op. cit.



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Women represent more than 80 per cent of the workforce in the industries, but their voices and aspirations for their industry are rarely heard. In a recent study on the impact of the Better Work programme, researchers found that gender discrimination is still prevalent in job assignments, pay, promotions, and working hours, and that sexual harassment is a key concern (Box 6).<sup>47</sup> The experience of the ILO shows that gender equality can be achieved through a combination of adopting and enforcing appropriate legal frameworks and national policies concerning equality of opportunity and treatment that cover all workers, including home-based and casual workers and migrant workers; strengthening national human rights institutions; promoting comprehensive equal employment policies at the level of the enterprise; and promoting bipartite and tripartite social dialogue, and collaboration between governments and workers' and employers' organizations, on how to most effectively combat discrimination and promote equality for women at work.

**Box 6: Tackling sexual harassment**

There are no official figures for sexual harassment in the industries, partly because complaints remain rare due to the fear of retaliation. However, Better Work's impact assessment surveys show that 36 per cent of interviewed workers believe sexual harassment is a concern in their factories. To tackle sexual harassment, Better work has incorporated the topic in its five-year gender strategy, which aims to unite partners from private and public sectors and strengthen policies and practises at national, regional and international level.

*Source:* ILO: Global Gender Strategy 2018-22, Better Work's five-year gender strategy (Geneva, ILO and IFC, 2018).

Moreover, new technologies can play a role in promoting fundamental principles and rights at work. The Better Work programme has shown, for instance, that mobile technology has the potential to facilitate the organization of young women workers and to inform them about their rights.<sup>48</sup> While such technologies are supporting change on the ground, the full realization of fundamental principles and rights at work in the industries will occur only when all countries take concerted measures to implement and enforce them in law and in practice.

Labour administration and inspection is key to determining whether millions of mostly women and men will continue to toil in poor working conditions and hazardous and unhealthy workplaces, or whether they will be able to enjoy their rights and work in conditions of dignity and freedom. This will require that governments urgently increase the capacity of labour inspectorates to address the host of increasingly complex issues and challenges that the industries face in the future. It will also include updating policies and regulation to protect workers from new hazards and risks in the form of new technologies and the effects of climate change, as well as embracing new methods and technologies to assist the work of labour administrations and inspectorates. As more and more brands invest in digital solutions for end-to-end supply chain management and monitoring of working conditions and environmental performance, important questions are raised and will have to

<sup>47</sup> *ibid.*

<sup>48</sup> Almost all garment workers in Asia now own a mobile phone. The Better Work programme is finding ways of using this technology to deliver important information on labour rights, Better Work 2018, <https://betterwork.org/blog/2016/11/03/smart-phones-smart-workplaces/> [accessed 22 January 2019].

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be answered about whether and how such information is shared with labour administrations and labour inspectorates to uphold national labour laws and international labour standards.

The realization of fundamental principles and rights at work in TCLF will also require concerted action by all actors in global supply chains, consistent with their roles as prescribed in the 2016 resolution on decent work in global supply chains.<sup>49</sup> It is encouraging that more and more brands and companies are using the UN Guiding Principles for Business and Human Rights as well as the OECD Due Diligence Guidance for Responsible Business Conduct to prevent, address and remedy human and labour rights abuses committed in their operations and to increase their contribution to economic, environmental and social progress. It remains equally important that governments, and in particularly employers and workers, increasingly embrace freedom of association and social dialogue throughout the chain, including in the lowest tiers.<sup>50</sup>

### **3.3. Social protection**

#### **3.3.1. Social security**

The changes that globalization and structural adjustment have brought to the TCLF industries in high-income countries in the past decades have severely tested their social security systems. Outsourcing and offshoring have meant that thousands of employers went out of business and that millions of workers had to find new jobs. Governments invested considerable resources in the form of trade adjustment assistance for firms, temporary or long-term unemployment benefits, early retirement options, job training and relocation allowances for workers, coupled with an expansion of the coverage of wage and health insurance programmes.

Countries such as China which are on the verge of industrial restructuring are tasked with putting in place or strengthening similar programmes to protect workers in manufacturing industries. The effectiveness of these policies and programmes will to a large extent determine whether the increasing growth and productivity of the TCLF industries leads to higher levels of inequality or to reduced poverty for millions of women and men.

Meanwhile, in low-income and least developed countries, the question is whether existing or incipient systems of social security will be able to cope with the potential large numbers of workers who might lose their jobs and livelihoods as a result of technological advances, globalization, and climate change. Should the contributions that employers and workers in their nascent TCLF industries make to social security systems fall, the capacity of the social security systems in those countries, including the provision of pensions and other benefits, would come under additional pressure.

#### **3.3.2. Working conditions and occupational safety and health**

The effects of climate change already pose a threat to working conditions and to the safety and health of workers in the TCLF industries, and will likely do so in the future, particularly in the least developed countries with limited resources or infrastructure to protect populations and industries from high temperatures, air pollution, and extreme

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<sup>49</sup> ILO: International Labour Conference, 105th Session, Geneva, 2016: [Resolution concerning decent work in global supply chains](#).

<sup>50</sup> S. Hayter and J. Visser: *Collective Agreements: Extending Labour Protection* (Geneva, ILO, 2018).

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weather events. When it becomes too hot, people tend to work less efficiently – particularly outdoors or in factories without air-conditioning – due to the increased physical exertion and mental exhaustion. Extreme temperatures also increase the risk of accidents and expose workers to serious health risks including heat stroke, severe dehydration and exhaustion, and become life threatening when body temperatures rise above 40.6° Celsius. Heat also exacerbates the risks related to the use of chemicals, such as solvents in the production of shoes, which evaporate quicker in warm workplaces.<sup>51</sup>

As mentioned above, digitalization and automation is likely to further reduce the cost, and increase the speed, at which suppliers are able to deliver products to the consumer. In an industry that is characterized by cut-throat competition, this could further exacerbate the negative impacts that purchasing practices of brands and buyers often have on wages, hours and working conditions.

In this regard, Kucera found that the use of robots to reduce production costs in high-income countries has already been used as an argument by employers for not increasing wages in least developed countries.<sup>52</sup> In the future, the effects of digitalization and automation are likely to be hardest felt among SMEs that have not embraced or are unable to access new technologies, and among workers in the lowest tiers of increasingly fragmented global supply chains, particularly in countries where international labour standards are not effectively implemented in law or in practice.

While all new technologies and materials present new occupational safety and health hazards, digitalization and automation have the potential to improve working conditions and the safety and health of workers in the industries, which for many years have struggled with preventing and protecting workers from work-related accidents, injuries, and illnesses (Box 7). This potential includes the following –

- low-cost technologies such as fire alarms, sprinkler systems, fire doors or air conditioning could save lives and improve productivity
- laser cutters and sewbots could take over repetitive and hazardous tasks, meaning that fewer workers would be exposed to dangerous chemical substances or injuries associated with repetitive movements and long working hours
- new environmentally-friendly methods have been invented to replace the traditional sandblasting of jeans, which would also eliminate workers' exposure to silicosis
- solar panels and other forms of renewable energy could dramatically reduce the industries' reliance on highly polluting diesel-powered generators
- resource-efficient equipment could drastically reduce the industries' use of energy and water and improve their environmental footprint.

<sup>51</sup> UNDP & others. Climate change and labour: impacts of heat in the workplace. April 2016. The report was produced as part of the climate and labour partnership which involves the Climate Vulnerable Forum, UNDP, ILO, WHO, IOM, UNI Global Union, ITUC and ACT alliance, the Climate Vulnerable Forum, funded by GIZ.

<sup>52</sup> D. Kucera, op. cit.

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**Box 7: Will Rana Plaza be a turning point?**

On 24 April 2013, when the Savar building in Rana Plaza collapsed, 1,134 Bangladeshi workers – most of them young women – lost their lives. Like other grave industrial accidents before it, Rana Plaza created worldwide attention and resulted in calls from governments, investors and consumers for the need to urgently invest in workplace safety and improve occupational safety and health immediately.

While progress has been made in Dhaka, driven in large part by the Accord on Fire and Building Safety in Bangladesh and the Alliance for Bangladesh Worker Safety, it has been slow in other areas, and millions of workers in many developing countries continue to work in unsafe conditions. Unless existing TCLF-producing countries in Asia and emerging low-cost production countries in Africa step up investments in infrastructure and facilities, as well as in strengthening labour market governance, the labour inspectorate, social dialogue and trade union representation, the future of these industries will continue to be plagued by health and safety risks and the unnecessary loss of human lives.

The key question that remains is why the uptake has been so slow, and what governments, employers and workers can do to overcome these barriers and to support a just transition to more technologically advanced, safer, and more sustainable industries in the future.

### **3.4. Social dialogue**

In the past few decades, social dialogue has played a key role in transforming the industries profoundly by addressing the negative impacts of accelerating globalization, shifting employment patterns, increased insecurity, and ongoing financial pressures.<sup>53</sup> However, with more geographically dispersed production, rapid market-driven changes, and the readiness of brands and manufacturers to move from one sourcing country to another, social dialogue becomes more difficult to organize and could become even more challenging in the future. The profound changes that technological advances, climate change, globalization, and shifting demographics will bring about are likely to test the fundamental principles of solidarity and shared interests upon which trade unions and employers' organizations have been created.

In some newly industrializing countries, for instance, it is not uncommon that a large number of trade unions with different political affiliations operate in open conflict with each other and hence risk preventing workers from having a strong, unified voice. This might become even harder to manage as the boundaries between manufacturing and services become blurred and as workers with different backgrounds, occupations and trade union affiliations work in the same workplace. One of the largest challenges facing trade unions in the industries in the future, however, will be how to organize home-based workers and workers in non-standard forms of employment in the informal sector, particularly in countries with limited capacity to enforce labour laws and fundamental principles and rights at work.

The potentially enormous changes in the structure and composition of the TCLF industries is also likely to test the ability of small and medium-sized enterprises and their organizations to find common ground on how to address climate change and benefit from globalization and technological advances. The traditional model of offshoring and outsourcing has already generated different and at times opposing views on the best way

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<sup>53</sup> ILO: [Wages and Working Hours in the Textiles, Clothing, Leather and Footwear Industries](#), Issues Paper for discussion at the Global Dialogue Forum on Wages and Working Hours in the Textiles, Clothing, Leather and Footwear Industries, ILO Sectoral Activities Department (Geneva 2014).

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forward among buyers and brands, on the one hand, and medium and small manufacturing firms on the other. If anything, globalization is likely to spur even harder competition between enterprises and even greater inequalities in terms of their access to capital, markets and the new technology needed to stay in business.

At the same time new forms of social dialogue might evolve, with the call for more sustainable industries and stronger and broader engagement of the social partners, facilitated by the use of new forms of ICT and social media tools.<sup>54</sup> Growing concern about safety and health, labour rights abuses, and the need to mitigate and adapt to climate change have already brought governments, employers and workers together in innovative partnerships and alliances, at times also involving investors, international organizations, and civil society groups. Compared to other sectors, the TCLF industries have made noticeable progress in terms of experimenting with new forms of collaboration and social dialogue across borders. This includes international framework agreements between large multinational enterprises such as H&M, Inditex, Mizuno, Tchibo, and global union federations such as IndustriALL Global Union and UNI,<sup>55</sup> industry-wide initiatives such as the Accord on Fire and Building Safety in Bangladesh and the Alliance for Bangladesh Worker Safety, and Action, Collaboration, Transformation (ACT), an initiative led by international brands, retailers and trade unions to address the issue of living wages in garment supply chains.

In view of the significant impact that the megatrends and drivers set out in Chapter 1 will have on decent work in the TCLF industries in the future, it is encouraging that there is a growing awareness of the need for social dialogue to address emerging and future challenges and take advantage of new opportunities. These industries led the industrial revolution, and have helped lift millions of women and men out of poverty. The time is ripe for governments, employers and workers to jointly define how the industries can in the future become greener, more inclusive, and sustainable while realizing decent work.

<sup>54</sup> International Organisation of Employers (IOE): *Understanding the Future of Work* (Geneva, 2017).

<sup>55</sup> ILO: [\*International Framework Agreements in the food retail, garment and chemicals sectors: lessons learned from three case studies\*](#). Sectoral Policies Department (Geneva, 2018).

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## 4. The future of work in three different country contexts

The challenges and opportunities arising from technological change, globalization, climate change, and demographic shifts are markedly different in three categories of countries – least developed, middle-income, and high-income countries. To effectively shape a future that works for all in the TCLF industries, the policies, strategies and actions required to advance decent work must be firmly anchored in the realities of each country and aligned with the priorities of ILO constituents.

### 4.1. Least-developed countries: A rocky road ahead

*“The future is already here—it’s just not evenly distributed”*. While William Ford Gibson might not have had the TCLF industries in mind when he coined this phrase, the point is highly relevant to key garment and textile producing countries like Bangladesh, Cambodia, Ethiopia, Haiti, and Myanmar.

While the TCLF industries are critical to many least-developed countries’ (LDCs) economic growth – in the case of Cambodia accounting for 65 per cent of total exports in 2016,<sup>56</sup> they do not currently have the same resources or capacity to invest in, or attract foreign direct investment into, new technologies or innovation. As long as technological adoption remains low in the TLCF industries, the traditional low-cost labour model will provide firms in LDCs with cost advantages over competitors in middle and high-income countries. However, the decreasing cost and increased efficiency of robotics and automation, coupled with digitalization, is likely to erode this advantage over time and to exert further downward pressure on wages, working conditions, and the use of unregistered subcontracting factories and enterprises. As discussed above, the search for shorter delivery cycles in an omni-channel global marketplace is already causing some brands and buyers to source from firms in high and middle-income countries closer to their key consumer markets.

In addition, firms in LDCs are more susceptible to instability in the increasingly volatile global trading system. Many LDCs are currently highly dependent on exports to markets in North America and Europe, but this may change over time as domestic demand for TLCF continues to increase in Asian countries such as China and India, and eventually in Africa. In the meantime, there is an urgent need to invest in technological transfer and trade assistance to LDCs to support their economic development.

Should employment in the TCLF industries be drastically reduced, there are currently few alternative jobs for the young and growing populations of many LDCs. In the worst case scenario, social protection systems – where they exist – would not be able to cope, and it is likely that social instability and out-migration would follow. With huge overcapacity already existing in the industries, their traditional role as a first stepping stone to industrial and economic development could be threatened, with governments having to look for alternative sources of competitive advantage to generate decent jobs and inclusive economic growth.

<sup>56</sup> Textiles Intelligence: “Business and market analysis for the global textile and apparel industries”, in *Textile Outlook International* (2017, No. 189, December).

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## 4.2. Middle income countries: The challenge of restructuring

The world's middle-income countries (MICs)<sup>57</sup> are a diverse group by size, population, and income level. The challenges and opportunities faced by TCLF-producing MICs like China and India as well as Indonesia, Morocco, Nicaragua, Pakistan, and Turkey are therefore markedly different. However, they all face the common challenge of maintaining or upgrading their respective roles and position in increasingly complex global supply chains.

The impact of restructuring in the TCLF industries is likely to be hard felt by both enterprises and workers in many of the MICs. If the historical transformation of the industries in high-income countries (HIC) is a lesson for the future, thousands of enterprises will be forced to close and the contraction in employment will be counted in millions of jobs. To avoid such a scenario it is imperative to invest in research, infrastructure and new technologies to upgrade the industries, in skills development and training, and in social protection. In doing so, policies and plans for the TCLF industries must be coupled with broader policies for advancing inclusive growth and decent work, to facilitate the creation of new jobs in other manufacturing industries and across the entire economy. Investment into China's TCLF industry is growing steadily, and the government has set ambitious targets for building more technology-intensive and less water- and energy-dependent industries. While starting from a different level, India is also investing in infrastructure and technology through various policies, incentives and schemes such as the Technology Upgradation Fund, Integrated Textile Parks, and the Capacity Building in Textile Sector Scheme for skills development.<sup>58</sup>

Other and relatively smaller MICs are becoming increasingly dependent on their proximity and access to markets in North America and Europe in particular, as well as their continued production of the raw materials used by the TCLF industries. Unlike China's or India's industries, these MICs will not be able to benefit to the same degree from rapidly growing domestic demand. Their continued competitiveness will therefore largely depend on stable free trade agreements with the United States and the European Union, and on the specific terms of trade and investment that they will be able to (re-)negotiate. Indeed, in the face of competition from China and India, a country such as Turkey has already moved on to innovative designs, fashion styles, and products catering to high-end customers, and have invested in technology and business models that have shortened delivery times to mostly European markets.

## 4.3. High-income countries: Ready for the digital revolution?

In more and more HICs, the TCLF industries are seen as an integral part of those countries' creative industries, alongside fashion, design, digital production, music, and film-making. Faced with intense international competition, enterprises in such HICs are increasing their use of creative competencies to develop, design and market their products and services. Governments in these countries are simultaneously supporting the green

<sup>57</sup> The World Bank defines MICs as having a per capita gross national income of US\$1,026 to \$12,475 (2011).

<sup>58</sup> India Brand Equity Foundation (IBEF), 2018: *Textile Industry & Market Growth in India*, <https://www.ibef.org/industry/textiles.aspx> [accessed 24 January 2019]; Union Budget of India (2018-2019), India Brand Equity Foundation (IBEF), 2018, <https://www.ibef.org/economy/union-budget-2018-19> [accessed 24 January 2019].

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transition of their industries by supporting the development of environmentally friendly designs, products and packaging that are produced from biodegradable or recyclable materials. Manufacturing companies in these countries are leading the way in the use of design and user-driven innovation as part of the development and differentiation of their products in the global market place. This includes investments in robotics and automation, and is likely to lead to continued net re-shoring of the manufacturing of these niche and high-end products in the future.

A critical question for HICs is whether their industries are ready for the digital revolution in an uncertain, challenging and changing context. While more and more firms are investing in automation and robotics, the TCLF industries have only just begun to embrace digital technologies, driven by potential productivity gains, savings, and the continuing search for ways to respond to customer demand and get products to markets faster. In its Apparel CPO Survey 2017, McKinsey reports that nearly 90 per cent of 63 fashion executives surveyed said they see significantly higher investments in technology between now and 2030, and concludes that the “winners will be those that make the shift from a supply to a demand focus, ramp up their speed to market, become much more flexible, and reimagine their supply chains end to end.”<sup>59</sup>

As discussed above, e-commerce and social media are rapidly changing the core functions of marketing, retail, logistics, finance and customer service in the industries in HICs such as Canada, France, Germany, the United Kingdom, and the United States. With more and more processes becoming digitized, the potential impact of AI is likely to increase, and may sooner or later replace jobs that traditionally have not been at risk of automation: accountants, designers, forecasters, and sales representatives. At the same time, digitalization may bring about new opportunities for ICT specialists and workers with a background in the STEM disciplines. Investments in education, training and life-long learning will increasingly determine to what extent employers and workers seize opportunities and address the challenges of a digitalized world of work in HICs.

In addition to potential job losses, concerns have been raised about the global increase in non-standard forms of employment, such as temporary or part-time employment, agency work, and dependent self-employment, which are often linked to greater insecurity for workers. Governments in HICs are currently addressing these challenges through various forms of labour market regulation and effective social protection measures for workers, and by investing in broader access to training and skills development.

<sup>59</sup> A. Berg et al., *op. cit.*



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## 5. Shaping a future that works for all

The textile, clothing, leather and footwear (TCLF) industries are woven into the cultures and history of our societies, a history of industrialization, economic progress, wealth, style and fashion, but also of great changes, struggles and hardship for millions of mostly women workers.

The industries continue to be of key economic importance in all countries and a source of opportunities and hope for many, such as the Kenyan entrepreneur opening a new company, the young Cambodian woman looking for her first paid job, the Canadian engineer getting a new 3D printer to work, or the Italian designer with new ideas on how shoes should look next year. Their aspirations remind us that it is up to all of us – employers, workers, policy makers, investors, consumers, civil society, and industry experts – to help shape the future of work we want for the industries.

However, compared with other industries, TCLF are not generally perceived as strategic. Workers' rights are often not recognized there, and enterprises and jobs are not considered of equal value to those in other industries. For these industries to contribute to social and economic development that is truly sustainable, there is a need for a new vision – one that is based on new models of production and organization of work and with incentives for sustainable enterprises to grow and opportunities for workers to work in conditions of freedom, equity, security, and human dignity.

The challenges ahead are significant, complex and multifaceted, not least because the industries span the globe through increasingly interconnected yet complex supply chains. To advance decent work in these industries, sustainable industrial policies and actions will therefore have to be comprehensive, integrated and inclusive, and agreed and implemented by governments, employers and workers through joint efforts towards a common goal. Most importantly, any solution for shaping the future of work in TCLF should be grounded in the conditions and realities of the industries in each country, be it an LDC, MIC or HIC.

The megatrends and drivers discussed in this paper provide both opportunities and challenges for enterprises of all sizes, as well as for all workers in the TCLF industries and beyond. What is not known is how quickly or to what extent the new and rapidly advancing technologies and materials will change the industries, or what the consequences and impact will be for specific groups of firms and workers in different countries – particularly the most vulnerable workers for whom a job in a textile factory is often the only route out of poverty.

As discussed above, it is likely that the traditional model of production in LDCs with low labour and production costs will continue to co-exist alongside new and innovative business models and products made in middle- and high-income countries closer to or within global market centres. However, much will depend on the increasingly fragile trade system and on the call for a fairer and more sustainable production model that can change consumption behaviour and global demand.

In the worst case scenario, the knock-on effects of mass-unemployment caused by a collapsing local industry could create large-scale political destabilization and disrupt social and economic development in low-income countries, increasing global inequalities. In the best case scenario, employers, workers and governments will come together to formulate and implement sustainable industrial strategies for advancing inclusive economic growth and decent work in the TCLF industries.

To shape a future of work that works for all in the industries, this global vision should be based on a human-centred approach and a reinvigorated social contract between governments, employers and workers, and supported by sustainable industrial policies in TCLF producing countries. This will require active participation and a change of mindset by

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investors, brands, employers, workers and consumers. It will also require much better and forward-looking governance of the industries at the global and national level. In view of the challenges now faced by the industries, and those that technological advances, globalization, climate change and demographics will bring, social dialogue is not necessarily going to become less challenging in the future, but it will be needed in the industries more than ever before.





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