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The Textiles

OBSERVER



Cotton's Second Life:
**Toward Circular
Textiles**

**Reliable Cotton
Testing: Precision
Builds Trust**

**Textiles Policy as a Driver
of Growth for Apparel**

Major Events Will Put Textiles in the Spotlight



Kanwar Usman
Head of Textiles



**INTERNATIONAL
COTTON
ADVISORY
COMMITTEE**

It gives me great pleasure to open the second volume of Textiles Observer with a major announcement that marks a historic milestone in the global cotton and textiles value chain. Following Uzbekistan's decision to host the 2027 edition, Côte d'Ivoire has been officially confirmed as the host of the inaugural Global Cotton and Textiles Investment Summit in 2026. The journey of a dedicated global investment platform focused exclusively on cotton and textiles will thus begin in Abidjan, symbolizing a new era of opportunity, collaboration, and industrial transformation.

The Summit is designed to unlock the strategic role of textiles in economic development, particularly in cotton-producing ICAC Member Countries, by attracting high-value investments that generate employment, foster inclusive growth, and build vertically integrated value chains. It will feature a high-level conference where countries will present their textile policies and investment potential, a dynamic exhibition area with country pavilions and private sector booths, and a dedicated networking app to identify key stakeholders, schedule B2B meetings in advance, and facilitate meaningful engagement. In the lead-up to the event, ICAC will actively assist its member countries in developing national textile policies to strengthen their positioning as preferred investment destinations across the cotton and textiles value chain. This first-of-its-kind summit is not merely an event, it is a launchpad for long-term investment, policy innovation, and transformative growth.

As we look ahead, the 83rd Plenary Meeting to be held in Mwanza, Tanzania, from November 17–20, 2025, promises to be a pivotal event for the global cotton and textiles sector. With the theme “Leveraging Sustainable Cotton and Textiles for Rural and Industrial Development,” this year's meeting marks a significant advancement in textile-sector engagement. For the first time, the Plenary will feature four dedicated textiles sessions, reflecting the growing recognition among member countries that textile development is crucial for maximizing cotton's value, generating employment, and advancing industrialization. This growing footprint of textiles within the Plenary also signals rising government interest in crafting national textile policies and expanding investment into value-added manufacturing.

Letter from the Editor

The four dedicated sessions will address the following high-priority themes:

- The Role of National Textiles Policies in Developing a Globally Competitive Textile Sector
- Cotton Innovation Platform: Advancing Cotton into Technical and High-Value Textile Applications
- Financing Investment in the Textiles and Apparel Value Chain in Emerging Markets
- Sustainable Textiles: Decarbonizing the Textiles Value Chain

These sessions aim to foster action-oriented dialogue, build international collaboration, and accelerate innovation, financing, and sustainability across the cotton-textile value chain. In this volume, we are pleased to present three articles that reflect the depth and breadth of current developments in our sector:

1. Toward Standardized Classing

Dr. René van der Sluijs, Principal Consultant at Textile Technical Services and Chair of CSITC, highlights the industry's shift from subjective cotton classing to objective testing via Standard Instruments for Testing Cotton (SITC). He outlines the essential requirements ranging from laboratory conditions to testing protocols that ensure trust, reliability, and consistency in global cotton quality assessments. Standardization is essential to build trust in cotton quality across the global trade.

2. Obstacles and Research Approaches in Cotton Recycling

Justin Kühn and Prof. Thomas Gries from the Institut für Textiltechnik at RWTH Aachen University examine the technical and systemic challenges in recycling cotton especially blends and explore emerging innovations aimed at closing the loop. Their work contributes to advancing the circular economy in the textile sector.

3. Global Apparel Market Insights, Textiles and Apparel Policy Framework, and Strategic Enablers for Competitiveness

Authored by Kanwar Usman, Head of Textiles at ICAC, this article examines the global apparel market and shifting consumption trends, with a focus on the largest consuming nations. It reviews the world's major apparel manufacturing hubs and evaluates Africa's role in global apparel exports, highlighting its current market share in leading apparel categories and its potential for expansion. The article concludes by outlining how cotton-rich countries can implement robust textiles policies to attract investment, advance sustainability, and strengthen their position within the global value chain.

As always, we welcome your feedback and collaboration as we continue to build a more resilient, sustainable, and inclusive textiles future.



Toward Standardized Classing

*By Marinus Marinus (René) van der Sluijs
Principal Consultant Textile Technical Services and Chair of CSITC*

Introduction

As was highlighted in the paper entitled, 'Preserving Fiber Quality Through the Cotton Production Pipeline,' which was published in the ICAC Textiles Observer Volume 1, Issue 1, fiber quality is of paramount importance.

There is an international consensus that the measurement of cotton fiber properties by the traditional method of subjective classing should be replaced by objective measurement by high volume testing instruments, referred to as Standard Instrument for Testing Cotton (SITC).

There are, however, some technical and operating issues to overcome to ensure that classing and all other testing facilities are standardized, so that they provide dependable, consistent, reliable and repeatable results.

Sampling, layout and design of the facility, atmospheric conditions, conditioning of samples, maintenance and condition of instruments, testing procedures and protocols, calibration and verification of the instruments, participation in local and international Round Trials as well as training, experience and management of the personnel all play a pivotal role in providing results that are accepted and trusted by the cotton trade as a whole.

This article aims to provide a brief outline of some of the requirements to ensure that SITC test results are reliable and accurate.



Sampling

A sample should be extracted from each side of a bale preferably at the gin but in some extenuating circumstances at the warehouse. The sample should be at least 120 mm wide, 220 mm long and 140 mm high with a weight of about 200 grams.

This size is especially important for color and trash measurement where the sample window must be fully covered by the specimen in order to obtain an accurate measurement. If cotton samples are too small to cover the entire sample window, the color and trash measurements should not be reported. Cut or trimmed, dirty and damaged and uneven samples should not be tested for classing purposes. Leafy and very low-grade samples should be tested with care.

Samples must not have bolt holes originating from the press, and must have an identification tag and packaged appropriately to preserve the identity and integrity of the individual sample.

See Figure 1 for sample size.

Figure 1: Sample Size



Layout and design of the testing facility

Layout

Where possible the facility should be located within another building, with no windows and outside doors to aid in providing consistent environmental conditions. Air locks for doors leading into the facility from unconditioned areas are highly recommended.



Space

There should be sufficient space available in the facility for the instruments, personnel and storage. Instruments should be easily accessible with enough space for doors and panels to be opened for cleaning, servicing and maintenance. Personnel should be able to move freely in a safe manner and there should be enough space to store samples and other miscellaneous items required by the facility.

Electrical

Consistent and reliable power supply is crucial for any facility to operate efficiently and to protect SITC instruments and personnel. Surge protection measures are therefore key as is the additional safeguard of adding uninterruptable power supply (UPS) units to each instrument to protect them from power surges and outages.

Compressed Air

SITC instruments need a consistent and uninterrupted supply of compressed air for testing samples. Compressors should be large enough to provide the required compressed air

(minimum of 7 to 8 bar) to conduct testing and be maintained and serviced on a regular basis. Furthermore, to prevent oil from contaminating the instruments, which can be catastrophic, and influence test results, a suitable filter should be installed to drain off any oil prior to the air being distributed to the instruments.

Operation/Testing

The SITC manufacturer's instruction manual and recommendations for operation of the system should be followed. SITC instruments are capable of testing and producing results of a number of parameters according to 'Standard Test Methods for Measurement of Physical Properties of Raw Cotton by Cotton Classification Instruments,' ASTM D5867-12(2020) used by the cotton trade. These include fiber length, length uniformity, strength, micronaire, color, both reflectance (Rd) and yellowness (+b) and trash in terms of trash count, % area and leaf grade. The test method specifies that at least two tests should be conducted for fiber length, strength, color and trash and one for micronaire.

Other parameters such as short fiber index, elongation & maturity may also be reported.

Maintenance and Condition of Instruments

It is recommended that all instruments should be checked and serviced prior to the beginning of a testing season or alternatively every year. This should ideally be performed by a representative of the instrument manufacturer, or a highly skilled contractor. In addition to this the instruments should be cleaned on a regular basis during the season. Every instrument should have a logbook to record any issues for evaluation during and after the season.

All instruments should have the latest version of software installed and should be verified prior to the start of the season according to 'Standard Practice for Qualification of Cotton Classification Instruments for Cotton Marketing', ASTM D7410-07(2020).

The balance for the determination of sample weight in micronaire measurement should be calibrated annually by either a representative of the instrument manufacturer or a qualification body. Alternately the sample weights used for verification should be calibrated by a qualification body.

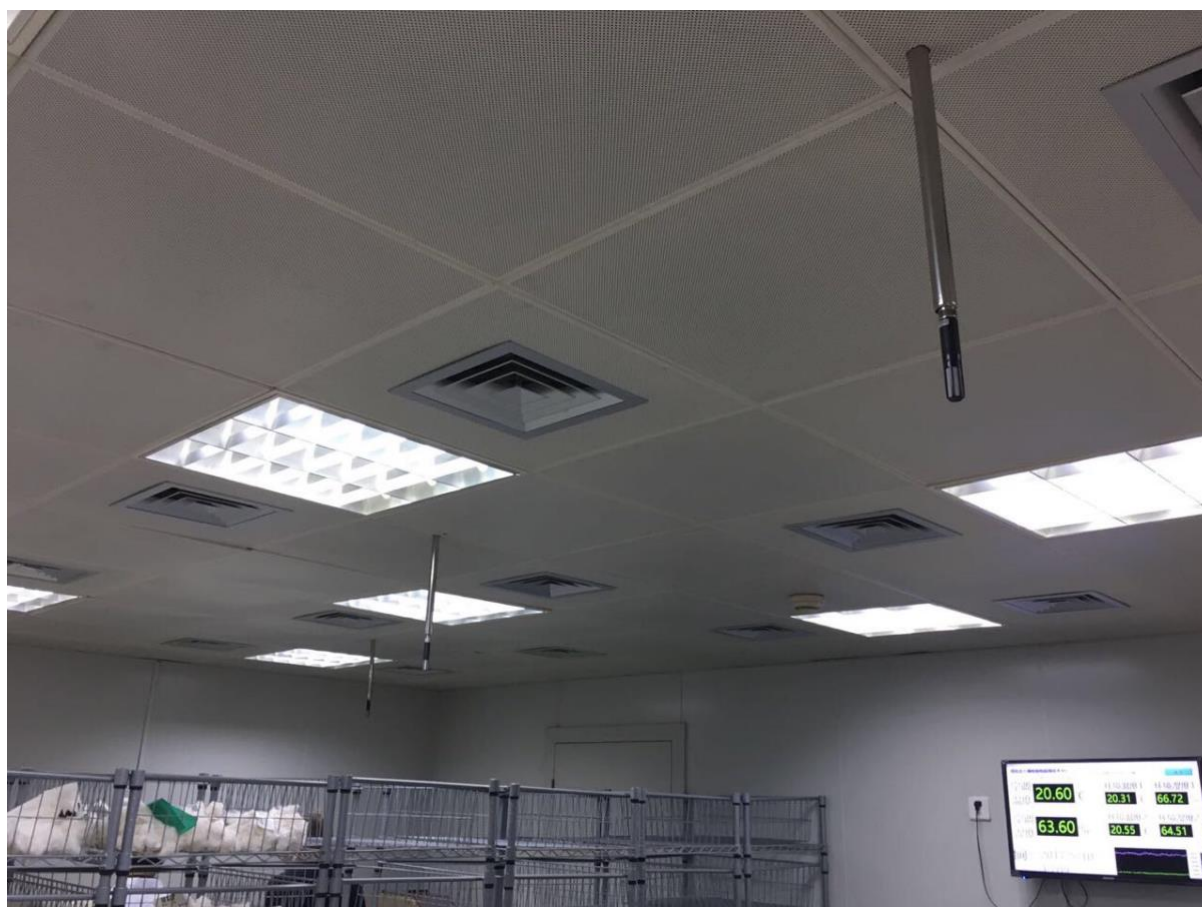
Atmospheric Conditions/Conditioning

As the physical properties of cotton can be influenced by their moisture content it is important that samples are brought to and tested at approved atmospheric conditions. An integrated Air Management System (AMS) with sufficient capacity to maintain the required conditions should be installed. The atmospheric conditions for the classification of cotton as per 'Standard Practice for Conditioning and Testing Textiles,' ASTM D1776/D1776M-20(2024), are Temperature of 21°C +/- 1°C and Relative Humidity of 65% +/- 2%. It is recommended that the testing facility is conditioned permanently 24/7 during the classing season or at least when testing is conducted on a continuous basis. The temperature and humidity should be monitored continuously by independent electronic sensors that have sufficient accuracy and sensitivity, suitable to detect and record short term fluctuations at least every two minutes or more frequently.

Records of the temperature and relative humidity readings should be kept.

The number of sensors required depends on the length, height and width of the facility and as a rule of thumb should be at least one sensor per 50 m³ located in the middle of the room hanging from the roof at 1.5 to 2.5 meters from the floor- see Figure 2.

Figure 2: Sensors



These sensors need to be checked and calibrated externally by either a qualification body or by the instrument manufacturer on an annual basis.

Sample Conditioning

As per ‘Standard Test Methods for Measurement of Physical Properties of Raw Cotton by Cotton Classification Instruments,’ ASTM D5867-12(2020), the moisture content of samples should be between 6.75% and 8.25% (dry weight basis) prior to the commencement of testing. Samples should always be conditioned from the dry side as cotton has hysteresis which affects the equilibrium amount of water absorbed. If samples have a high moisture content they may need to be preconditioned to a relatively dry moisture content prior to sample conditioning.

Cotton samples can be conditioned by either passive or rapid/active conditioning. In both instances samples and calibration material must be conditioned in open-wire shelves, plastic mesh baskets or mesh wire racks - see Figure 3.

Figure 3: Sample Racks



Conditioning of samples in sacks, wrappers or other coverings is not accepted as air needs to penetrate the samples from all sides. There should be sufficient space between the racks with a distance of at least 20 cm.

For passive conditioning samples must be conditioned for a minimum of 12 hours but preferably more than 24 hours where practically possible. Rapid conditioning units which are generally situated in the same conditioned room can also be used as an alternative to passive conditioning. Rapid conditioning is achieved by drawing air through the samples for at least 15 minutes until equilibrium with the surrounding atmosphere is reached. The total conditioning time is usually less than one hour. In both cases the moisture content should be periodically verified, with externally checked and calibrated handheld moisture meters (for example Delmhorst C2000 cotton moisture meter or equivalent). If the samples are not within the accepted moisture range of 6.75% and 8.25%, they must be reconditioned. Records need to be kept indicating the date, time and moisture content.

No moisture correction should be applied to test results. However, if any moisture correction has been applied it should be reported with the results, bearing in mind that research has demonstrated that moisture correction is unreliable.

Calibration and Verification of Instruments

General

Calibration contributes to the accuracy and confidence in SITC measurements but is not a substitute for maintaining the equipment in good operating condition or maintaining properly adjusted and controlled atmospheric conditions. Once calibrated, verification checks should be conducted to determine whether the instrument is still within tolerance. Recalibration is only required when calibration check results are outside of the defined tolerances, or there are consistent deviations as determined by independent checks or in Round Trials, changes of the calibration material, conditions and instrument repair or maintenance.

Calibration and verification cottons must be stored in the conditioned room for a minimum of 72 hours to ensure consistent moisture equilibrium.

Calibration Material

All calibration material must be obtained from the United States Department of Agriculture Agricultural Marketing Service (USDA-AMS). Universal HVI Calibration Cotton Standards (U-HVI-CCS) are samples from bales of ginned cotton lint with established standard values for length, length uniformity and strength. For Upland cotton, Universal Short-Weak and Long-Strong calibration cottons are required and for Extra Long Staple (ELS) cotton ELS Short-Weak and ELS Long-Strong calibration cottons are required. These calibration cottons are packed in boxes which weigh approximately 2.27 kg each and have an expiration date that must be adhered to by the laboratory.

Universal HVI Micronaire Calibration Cotton Standards are samples from bales of ginned and carded cotton lint with established standard values for micronaire. Two standard samples are required, one low micronaire (2.5 to 3.5) and one high (5.0 to 5.6) and irrespective of what low and high micronaire cottons are used they should differ by at least 1.5 micronaire. These calibration cottons are packed in rolls which weigh approximately 0.45 kg each and have no expiration date.

An alternative way to calibrate micronaire is by using the USDA orifice calibration method. This method involves the use of high and low mechanical air orifices, in place of calibration cottons, to ensure accurate chamber volume. As these orifices are capable of only calibrating the air systems, calibration cottons should still be used after this method to verify test values. Calibration cottons need to be replaced when they have been used frequently ("overused") and have an appearance of being matted or ropey, or if there is any suspicion that they have been contaminated in some way.

Calibration tiles are designed for the calibration of color in terms of reflectance (Rd) and yellowness (+b). A set comprises five ceramic tiles (central, white, brown, yellow & gray) covering a range of established standard values for Rd and +b. Color tile sets are instrument and illumination specific (Xenon or Incandescent), and the instrument type and illumination type must be specified when ordering. The surface of the color tiles must be clean to ensure accurate calibration, an effective procedure for cleaning the tiles is to spray a diluted non-abrasive liquid detergent on the tile surface, followed by wiping with a clean cloth or tissue. Detergents containing bleach, abrasive or other harsh cleaning agents should not be used. Color tiles must be returned to USDA-AMS every two years for re-evaluation to ensure accurate colorimeter calibration.

There is also one calibration tile for the measurement of trash percent area and trash particle count. This tile comprises an image of patterned dots mounted under glass which has established standard values for trash percent area and trash particle count. The trash tile is also instrument and illumination specific.

The set of color and trash tiles is packed in a storage box which weighs 1.81 kg.

See Figure 4 for calibration materials supplied by USDA-AMS.

Figure 4: USDA-AMS Calibration Materials



Internal Verification Material

In addition to Universal Calibration Standards, there is an option to use internal check material for verification of test results, but not for calibration. The advantage of using this material is the reduced use of expensive calibration standards and the use of check testing material that are similar to those that are generally tested. Internal verification cotton should be established from homogeneous bales of even running cotton that has been saw-ginned. The mean and standard deviation is established by conducting at least 60 tests over several days from different parts of the bale.

Calibration & Calibration Check Tolerances

The acceptable tolerance for the calibration of the average test results are as follows:

- Micronaire within +/- 0.1 units
- Length +/- 0.013 inch or 0.33mm
- Length Uniformity +/- 1%
- Strength +/- 1 g/tex
- Color Rd and +b +/- 0.4 units
- Trash Area +/- 0.05 %

The acceptable tolerance for calibration checks of the average test results are as follows:

- Micronaire within +/- 0.1 units
- Length +/- 0.013 inch or 0.33mm UHML
- Length Uniformity +/- 1% UI
- Strength +/- 1 g/tex
- Color Rd +/- 1.0 units
- Color +b +/- 0.5.
- Trash Area +/- 0.1%
- Trash Count +/- 5

Calibration & Calibration Check Frequency

As highlighted earlier, calibration should ideally only be conducted where required. In contrast, calibration checks must be performed frequently to ensure accuracy of the test results. It is recommended that calibration checks are conducted at the beginning, middle and end of each shift. Calibration records should be kept for all the instruments and analyzed to determine if there are any trends.

Participation in Round Trials

The main aim of Round Trials is to determine the long-term reproducibility of each instrument, and if an instrument was found to be out of tolerance, the testing facility can take corrective action. Although there are a number of recognized International Round Trials such as ICA Bremen and USDA, the International Cotton Advisory Committee (ICAC) established a task force on Commercial Standardization of Instrument Testing of Cotton (CSITC). CSITC has been conducting Round Trials (RT) since 2007 as a means to achieve international standardization. The benefit of participation in CSITC RT as opposed to other RT's is that

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facilities are provided with: (1) an independent and objective comparison to more than 100 instruments worldwide, (2) an Overall Evaluation Result (OER) which indicates the standing of the instrument in ONE value, (3) a complete, specific report for each instrument with deviations (action items for improvements) allowing for targeted improvement, (4) results based on the evaluation of all single data, not only accuracy, but also precision (although not taken into account for the ranking), (5) a certificate of participation demonstrating commitment in quality management, and (6) a certificate displaying performance in comparison to the median of all the participating instruments.

Personnel

All personnel must be competent to perform their designated tasks and duties based on their training, skills and experience.

Test Methods

A standard test method *provides detailed directions on performing specific tests*. For reference purposes it is recommended to have up to date copies of all the standard test methods either in hardcopy or online and easily accessible.

Conclusion

In order for the cotton industry to move to the objective measurement by high volume testing instruments, some technical and operating issues will need to be overcome to ensure that classing facilities and all other testing facilities provide dependable, consistent, and repeatable results. These include sampling, layout and design of the facility, atmospheric conditions, conditioning of samples, maintenance and condition of instruments, testing procedures and protocols, calibration and verification of the instruments, participation in local and international Round Trials as well as training, experience and management of the personnel all play a pivotal role in providing results that are accepted and trusted by the cotton trade as a whole. These requirements being a prerequisite for obtaining either ISO 17025 accreditation, ISO 9001 or ICA Bremen certification.

It is also worth mentioning that the requirements outlined above can be utilized for any testing facility performing testing and inspection services for most materials and products.

References

Information for this article has been extracted from the following sources:

1. Guideline for Standardized Instrument Testing of Cotton, version 4.0, 46 pp, February 2025.
2. ICA Bremen International Laboratory Certification Programme, 30 pp, July 2014.

Obstacles and Research Approaches in Cotton Recycling — a Comprehensive Overview

*By Justin Kühn, Thomas Gries
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Abstract

The increasing demand for sustainable practices within the textile industry has catalyzed research into cotton recycling, a process that holds significant promise for reducing waste and conserving resources. However, several obstacles hinder the efficient recycling of cotton fibers, particularly when blended with synthetic materials. This article explores the current state of cotton recycling, identifies critical deficits in existing methodologies, sets forth ambitious goals for future research, outlines innovative approaches to overcome these challenges, and discusses current measures being implemented within the industry. By addressing these issues comprehensively, we aim to contribute to the advancement of cotton recycling technologies and promote a circular economy in textiles.

State of the Art

Cotton is the most widely used natural fibre globally, producing 26 million Tons every year. It's often-careless production is resource-intensive, leading to environmental concerns regarding water usage and pesticide application. The textile industry's shift towards sustainability has prompted interest in cotton recycling as a viable solution to mitigate these impacts. Presently, various methods exist for recycling post-consumer cotton waste; however, they are predominantly mechanical processes that often result in shorter lengths and diminished quality compared to virgin cotton.

Research has demonstrated that recycled cotton can be reintroduced into new products by at least 65 %. Garment typically contains a blend of materials—most notably man-made fibers from sewing yarns—that complicate the recycling process. The presence of dyes and finishes also poses challenges due to their unpredictable friction behaviors during processing. Furthermore, consumer handling may lead to unknown pre-treatments and damages that further complicate fiber recovery.

Despite advancements in technology aimed at improving recycling rates – such as R9 (Refuse, [...] Reuse, [...] Recycle, [...])–based approaches – current practices indicate that recycled cotton is often sold batch-wise with qualities classified similarly to virgin material but at significantly higher costs (approximately 1.5 times). Machine manufacturers have noted that yarn openings in pre-spinning machines can be adversely affected by residual yarn pieces from previous processes. Spinning machine manufacturers recommend either blending materials or implementing extensive cleaning procedures prior to spinning to ensure appropriate length distributions are achieved.

Deficit

While there exists a foundational understanding of the complexities involved in cotton recycling, significant deficits remain unaddressed within this domain. One primary obstacle lies in the mixed materials prevalent in post-consumer textiles; specifically, synthetic blends complicate separation processes due to differing melting points and chemical properties. Consequently, mechanical recycling methods yield shorter fibers which exhibit inferior performance characteristics compared to their virgin counterparts.

Moreover, dyed and finished fibers introduce variability into friction behavior during processing stages – a factor not sufficiently accounted for in current methodologies. The lack of standardized protocols for assessing pre-treatments or damages resulting from consumer handling further exacerbates inconsistencies within recycled batches.

Current market practices reflect an inclination toward conservative estimates regarding recycling potential: while some companies report achieving up to 50% recycled content within their products based on post-consumer waste streams, academic research suggests possibilities nearing 100%. Bridging this gap necessitates enhanced collaboration between academia and industry stakeholders focused on optimizing fiber recovery techniques while maintaining product integrity.

Goal

The overarching goal of this research initiative is to:

1. develop innovative strategies that enhance the efficiency and effectiveness of cotton recycling processes
2. establish standardized metrics for assessing fiber quality derived from recycled sources relative to virgin materials

Achieving these objectives will facilitate greater acceptance of recycled content among manufacturers while simultaneously promoting consumer confidence in sustainably sourced textiles.

To realize this vision requires multidisciplinary collaboration encompassing material science innovations alongside advancements in processing technologies tailored specifically for mixed-fiber inputs commonly encountered during textile recovery efforts.

Approach

To address identified deficits effectively requires a diverse approach, centered around three core strategies:

1. **Material Separation Techniques:** Advancements such as near-infrared spectroscopy (NIRS) could revolutionize sorting capabilities by allowing precise identification of fiber compositions prior to processing stages. This enables targeted interventions designed explicitly around specific material types present within collected waste streams. Moreover, material treatments, e. g. simple moisturization improves processing behavior.
2. **Mechanical Processing Optimization:** Research should focus on refining mechanical methods employed during shredding or carding operations aimed at reducing fiber degradation while maximizing recovery yields through iterative testing against varying input compositions.

Swimming (uncontrolled moving fibers in a drafting zone) need to be reduced and be under control.

3. Quality Assessment Standards: Establishing universally accepted testing methods and benchmarks will facilitate comparability among different sources' outputs. This allows manufacturers clearer insight into performance expectations associated with varying types and qualities. It is derived from recycled feedstocks versus traditional inputs utilized historically throughout production cycles.

Current Measures

In light of ongoing challenges surrounding effective cotton recycling initiatives worldwide today's landscape reflects both progresses made thus far alongside recognition still needed across multiple sectors involved therein:

- Several organizations have begun implementing pilot programs aimed at quantifying potential benefits derived from increased utilization rates pertaining specifically towards recovered fibers. This is done at university as well as company side.
- Collaborative efforts between universities engaged deeply within textile engineering disciplines alongside private sector partners demonstrate promising advancements towards developing proprietary technologies capable not only enhancing yield ratios but also improving overall product durability once reintroduced back into retail markets.
- Industry conferences focusing on sustainable textile practices provide platforms wherein stakeholders converge regularly exchange ideas foster collaborative relationships ultimately driving forward collective ambitions shared amongst all parties invested long-term success surrounding circularity principles woven intricately throughout modern-day fashion ecosystems globally recognized today!

In conclusion, despite existing obstacles impeding progress towards widespread adoption effective systems facilitating comprehensive solutions. It is necessary to overcome inherent limitations associated with conventional methodologies. Moving forward unlocking full potential inherent found within realm sustainable practices surrounding cotton recycling! Therefore, this shall mark the starting point of currently ongoing textile research at RWTH Aachen University. Further results will be shared in the next issues.

A List of Reference can be requested from the author at: justin.kuehn@ita.rwth-aachen.de.

Corresponding pictures:



Left: many yarn pieces after tearing a untreated denim fabric; longer fibres with many yarn pieces



Right: 100 % cotton from knitwear, treated with water before tearing; very short fibres without yarn pieces

About the Author:

Justin Kühn is Head of the Staple Fibre Technologies Department at the Institut für Textiltechnik of RWTH Aachen University, since beginning of 2024. His textile career started in 2014 with studying mechanical engineering while working in R&D for the textile machine manufacturer Saurer. After 3 years full time equivalent working, he started research in Staple Fibres at RWTH Aachen University. Major fields of his research are Ginning, Rotor spinning, cotton science, bast fibre science and personal protective equipment (PPE). The still rising field of research in recycling material rounds off his profile.



Global Apparel Market Insights, Textiles and Apparel Policy Framework, and Strategic Enablers for Competitiveness

By Kanwar Usman
ICAC Head of Textiles

The apparel market has consistently demonstrated remarkable resilience and growth over the past few decades. In 2024, the global apparel industry is poised to reach USD 1.79 trillion, and its expansion is expected to continue into the next decade. This growth is largely driven by several key factors, including rising middle-class consumption, urbanization, and the digitalization of retail platforms, particularly in emerging markets.

As more consumers gain access to global fashion trends through digital channels, demand for affordable, stylish apparel continues to surge. This transformation is not just limited to established markets, but is increasingly seen in developing economies where urbanization is advancing at a rapid pace.

However, despite the financial success of the apparel sector, there remains a significant imbalance in how the benefits of the cotton-textiles-apparel value chain are distributed across the globe. While some countries have successfully capitalized on the opportunities presented by this booming industry, others particularly those in regions with substantial cotton production have yet to harness the full potential of their textile sectors.

As global apparel trade continues to grow, it is vital to understand the distribution of economic benefits and the potential pathways for countries, especially in Africa and cotton-rich regions, to participate more fully in the value chain.

In this article, we will first take a close look at the global apparel market, analyzing the key drivers behind its growth. We will examine how the consumption of apparel has been evolving, with a particular focus on the largest importing and consuming nations. Next, we will turn our attention to the major apparel manufacturing hubs around the world, identifying the leading countries that drive the global production of textiles and garments.

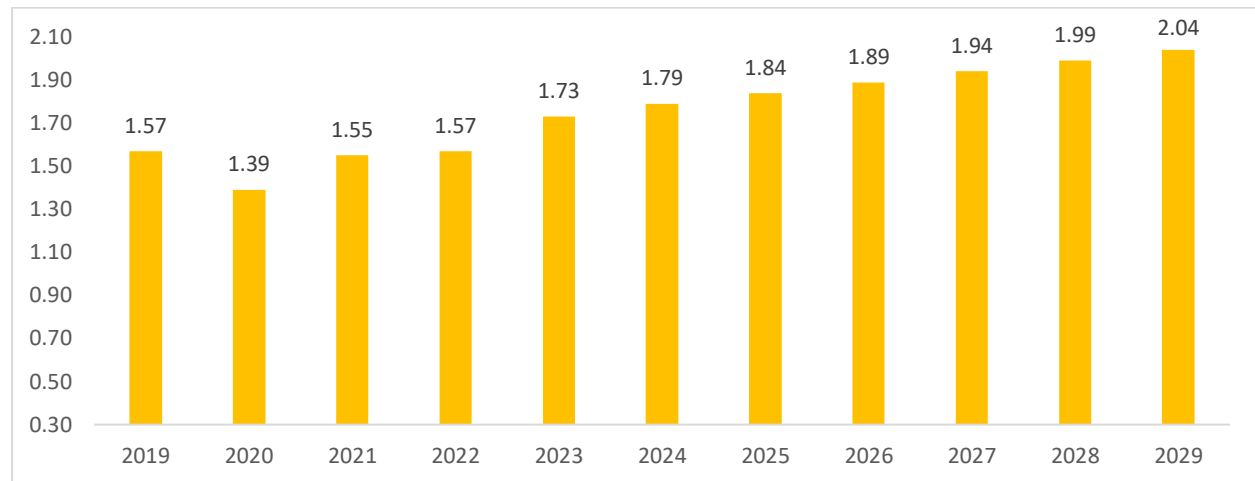
From there, we will explore the role of Africa in the global apparel export landscape, evaluating its current share of the market and identifying opportunities for growth. Finally, we will investigate how cotton-rich countries can develop and implement robust textiles policies that attract investment, promote sustainable practices, and strengthen their position within the global textiles and apparel value chain.

This analysis aims to offer valuable insights into the interplay between economic growth, and policy development in the textile sector. It will highlight the challenges and opportunities faced by countries looking to leverage their cotton production and textile industries for long-term economic development. By understanding the global dynamics at play, we can identify pathways for cotton-rich countries to enhance their textile policies and become more competitive players in the ever-expanding apparel market.

The Expanding Global Apparel Market

The apparel industry has consistently demonstrated resilience and growth over the past few decades. As global demand for apparel continues to rise, it is essential to understand the sector's financial trajectory, which presents significant economic opportunities. This growth is fueled by factors such as rising middle-class consumption, urbanization, and the rapid expansion of e-commerce particularly in emerging markets. As the market expands, it brings with it new challenges and opportunities that will shape the industry's future. In this section, we examine the global revenue trends of the apparel sector.

Table 1: Global Apparel Revenue, in USD Trillions



The global apparel industry has demonstrated both resilience and growth over the past decade, withstanding major disruptions such as the COVID-19 pandemic. In 2019, global revenue from apparel stood at USD 1.57 trillion. This figure fell sharply to USD 1.39 trillion in 2020 due to pandemic-related lockdowns, reduced consumer demand, and widespread supply chain interruptions. Recovery began in 2021, with revenue climbing to USD 1.55 trillion, nearly matching pre-pandemic levels. By 2022 and 2023, the market had fully rebounded, reaching USD 1.73 trillion.

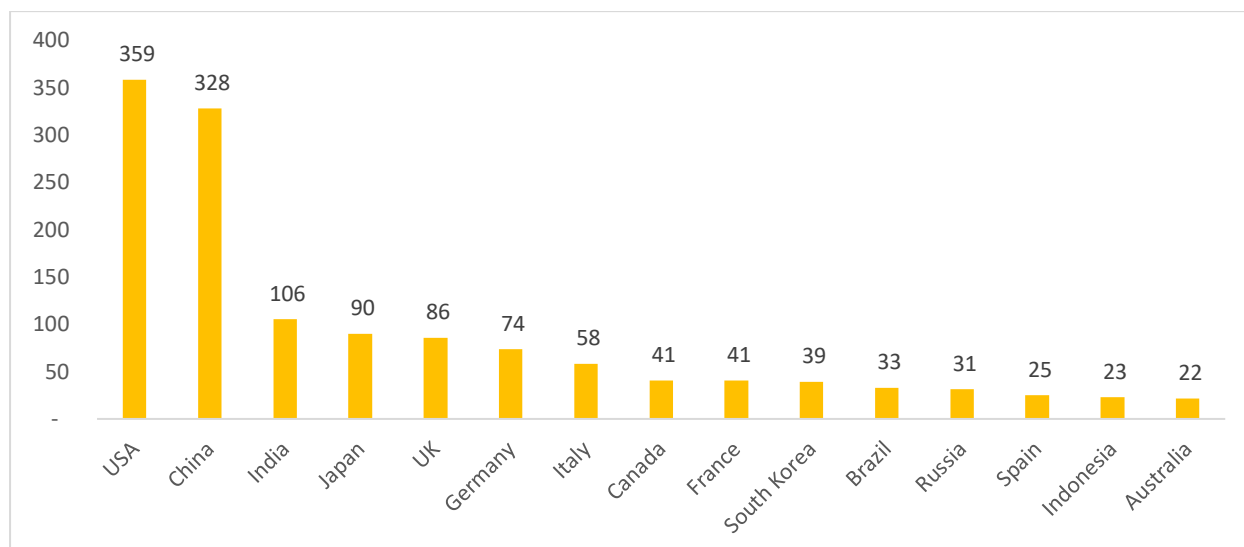
Looking ahead, the apparel sector is expected to maintain a steady upward trajectory, with revenue projected at USD 1.79 trillion in 2025 and USD 2.04 trillion by 2029, a compound annual growth rate (CAGR) of approximately 2.65% over the 2025–2029 period.

The projected USD 2.04 trillion market value underscores the sector's enormous economic weight. For governments and businesses, this represents a vast opportunity to tap into emerging markets, expand production capacity, and innovate across product segments. The potential for growth positions apparel as a key driver in the global economy and a strategic priority for investment, innovation, and market development.

Global Distribution of Apparel Revenue: A Country-Level Analysis

While the global apparel market is set to exceed USD 2 trillion by 2029, as shown in the previous section, this growth is far from evenly distributed. A closer look at country-level revenues reveals significant concentration among a small number of economies. The next section examines this distribution and explores how income levels, population size, and cultural consumption patterns shape the global apparel landscape. Understanding these disparities is crucial for identifying growth opportunities and designing strategies that support inclusive market expansion, ensuring that both developed and emerging economies can fully participate in the apparel value chain.

Table 2: Revenue of the Apparel Market Worldwide by Country in USD Billion



The global apparel market in 2024 is valued at USD 1,790 billion, encompassing both developed and emerging economies. Of this, the top 15 countries account for approximately USD 1,355 billion, 76% of the total market. These economies collectively represent just over half of the world's population (4.4 billion people), while the remaining 24% of apparel revenue (USD 435 billion) is generated by 3.7 billion people across less developed or smaller markets.

Table 3: Comparative Apparel Expenditure Metrics

	Apparel Market Revenue 2024 (USD Billion)	Per Capita Apparel Expenditure (USD)	Apparel Expenditure as % of GDP Per Capita
USA	359	1,055	1.23%
China	328	233	1.75%
India	106	73	2.70%
Japan	90	726	2.23%
UK	86	1,240	2.36%
Germany	74	868	1.58%
Italy	58	987	2.45%
Canada	41	991	1.82%
France	41	594	1.29%
South Korea	39	761	2.11%
Brazil	33	155	1.52%
Russia	31	215	1.45%
Spain	25	514	1.47%
Indonesia	23	80	1.62%
Australia	22	801	1.21%

These 15 countries account for 54% of global population, their disproportionate share of revenue reflects higher incomes and a greater consumer orientation toward fashion. This dominance highlights a concentration of purchasing power, brand influence, and retail infrastructure. The average per capita apparel expenditure in these countries is USD 308, more than double the USD 116 average in the rest of the world. Apparel spending globally constitutes approximately 1.62% of GDP, with considerable variation by country.

The United States leads with USD 359 billion in revenue, 20% of the global market, despite comprising only 4.2% of the population. This is driven by the world's highest GDP per capita and an annual apparel spend of USD 1,055 per person (1.23% of income). Key drivers include online shopping penetration, brand loyalty, and frequent seasonal consumption cycles.

China follows with USD 328 billion (18.4% of global market share). Despite a lower per capita spend (USD 233), apparel accounts for 1.75% of income, signaling rapid growth driven by urban middle-class consumers and digital retail expansion. India, with USD 106 billion in apparel revenue, spends the highest proportion of income on clothing i.e. 2.70%, despite a low per capita GDP of USD 2,711. This indicates a large share of essential spending and strong latent demand as incomes rise.

Japan, with USD 90 billion in revenue, exhibits a mature apparel market where high fashion consciousness results in per capita apparel expenditure of USD 726 (2.23% of GDP per capita), driven by aesthetics, quality, and a blend of domestic and international brands. The UK, with USD 86 billion in sales, records the highest per capita apparel spend (USD 1,240), 2.36% of GDP per capita. Fashion holds cultural prominence, supported by strong e-commerce systems and London's global fashion status.

Germany contributes USD 74 billion with per capita spending of USD 868 (1.58%). Known for its pragmatic and value-conscious consumers, the market is driven by quality, functionality, and an increasing tilt toward sustainable choices. Italy's USD 58 billion market reflects deep fashion traditions. At USD 987 per person (2.45% of GDP per capita), spending is strongly influenced by local luxury labels and artisanal craftsmanship. Canada's USD 41 billion market shows high per capita expenditure (USD 991 or 1.82%), with consumers driven by climatic needs, brand loyalty, and rising interest in ethical fashion.

France also contributes USD 41 billion, though per capita spending is lower at USD 594 (1.29%). South Korea's USD 39 billion market is notable for high urban fashion sensibilities and cultural influence. Consumers spend USD 761 per capita (2.11%). Brazil contributes USD 33 billion with modest per capita spending (USD 155 or 1.52%) but significant local production and consumption. Russia's USD 31 billion market is shaped by economic and climatic conditions, with apparel spend at 1.45% of income.

Spain's USD 25 billion revenue is bolstered by global fast fashion brands like Inditex. At USD 514 per person (1.47%), the market blends domestic consumption with export capacity. Indonesia adds USD 23 billion, with low per capita spending (USD 80 or 1.62%), but strong demand driven by urbanization and a young demographic. Australia's small population still contributes USD 22 billion. At USD 801 per capita (1.21%), demand is steady, supported by high income and growing lifestyle wear preferences.

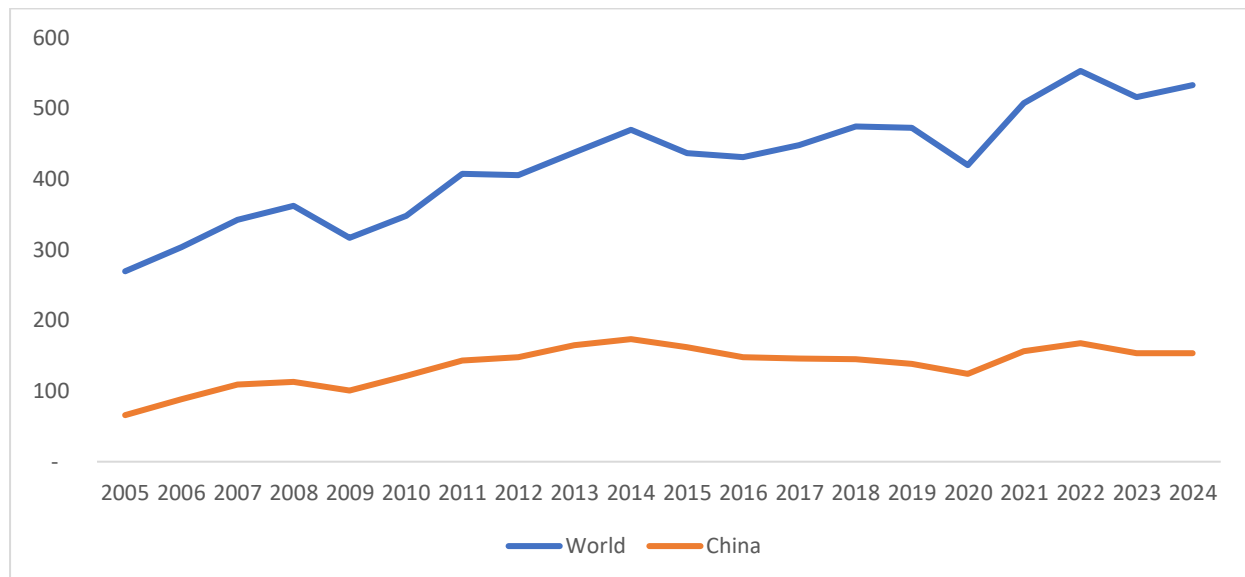
In short, the 2024 global apparel landscape is marked by sharp contrasts. Developed countries dominate in per capita spending, while emerging economies, despite lower absolute figures, allocate a larger share of income to apparel.

Global Apparel Manufacturing: Top Exporting Countries and Shifting Dynamics

Apparel production is concentrated in a select group of nations, shaped by cost competitiveness, trade access, industrial policy, and manufacturing capabilities. China remains the world's largest apparel exporter, but several South and Southeast Asian countries have rapidly expanded their global roles over the past two decades. High-income European economies also maintain a strong presence, with eight of the top 15 exporters, including Germany, Italy, Türkiye, France, Netherlands, Poland, Belgium, and Spain are

leveraging advanced manufacturing, branding, nearshoring, and specialization in high-value segments.

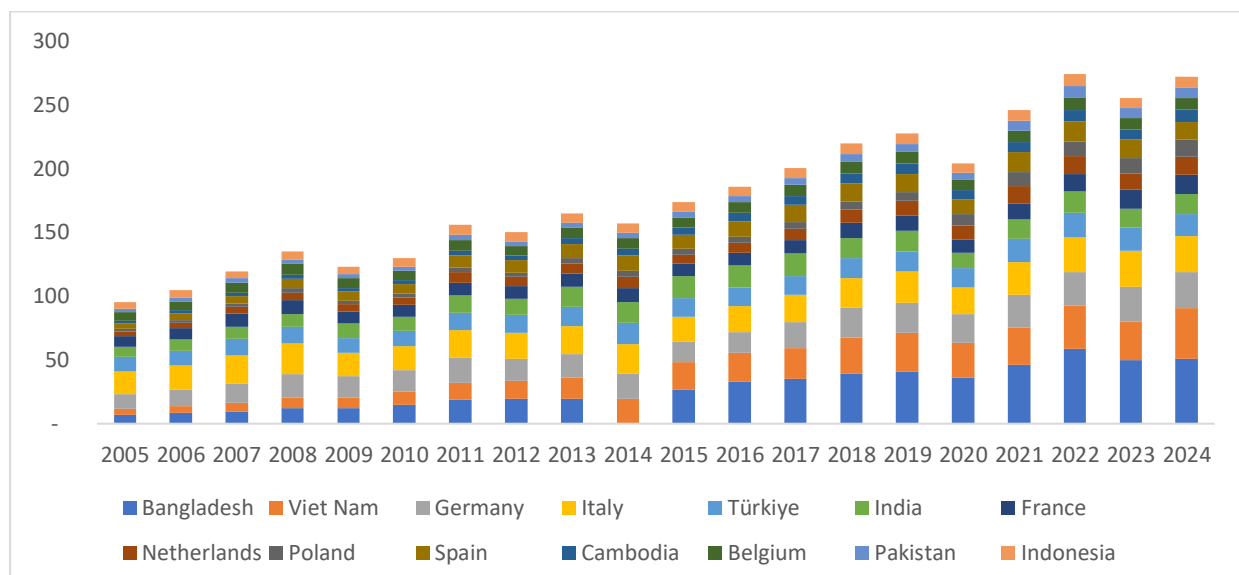
Table 4: World and China Apparel Exports in USD Billion



Between 2005 and 2024, global apparel exports grew from USD 269 billion to USD 533 billion, a CAGR of 3.66%. This growth has been uneven: some countries surged ahead, others slipped, and a few maintained stable shares despite global headwinds.

China's exports rose from USD 66 billion to USD 153 billion (CAGR 4.54%), increasing its share from 24.45% to 28.73%. Rising labor costs and sourcing diversification have not eroded its dominance, thanks to unmatched scale, infrastructure, and vertical integration.

Table 5: Top Apparel Exporting Countries After China in USD Billion



Among the most remarkable growth stories are Bangladesh and Vietnam, now ranked 2nd and 3rd globally. Bangladesh increased its apparel exports from USD 7 billion in 2005 to USD 51 billion in 2024, posting an impressive CAGR of 11.15%. Its global share surged from 2.54% to 9.57%, and its ranking improved dramatically from 9th to 2nd. Leveraging duty-free access to major market and a cost-competitive workforce, Bangladesh has

become a go-to hub for global brands. Vietnam outpaced all others with a 12.03% CAGR, lifting its apparel exports from USD 5 billion in 2005 to USD 39 billion in 2024. It moved from 14th to 3rd in the rankings, increasing its global share from 1.69% to 7.4%. Strong trade agreements, a stable investment environment, and rising capabilities in complex garments contributed to this rise.

India posted a modest CAGR of 3.48%, growing its apparel exports from USD 8 billion to USD 16 billion over the period. While it remained among the top 10 exporters (ranked 7th in 2024, down from 6th in 2005), its global share slightly declined from 3.04% to 2.95%, reflecting supply-side inefficiencies and missed opportunities in deeper integration with global supply chains.

Pakistan, despite being a textile-centric economy, recorded a CAGR of 5.8%, with apparel exports increasing from USD 3 billion to USD 9 billion. Its global share grew from 1.11% to 1.63%, improving its rank from 21st in 2005 to 14th in 2024. However, its potential remains underutilized due to energy and financing challenges.

Cambodia delivered an 8.17% CAGR, increasing exports from USD 2 billion to USD 10 billion, raising its global share from 0.82% to 1.84% and improving its rank from 27th to 12th. Cambodia remains attractive for buyers looking to diversify sourcing beyond China, although infrastructure limitations persist.

Indonesia, with a slower CAGR of 2.82%, saw its apparel exports rise from USD 5 billion to USD 8 billion. Its share declined from 1.82% to 1.56%, and its rank dropped from 11th to 15th, highlighting stagnation in competitiveness.

A perhaps underappreciated trend is the continued prominence of European exporters, eight of which are among the top 15 apparel-exporting countries in 2024: Germany, Italy, Türkiye, France, Netherlands, Poland, Belgium and Spain. Despite being high-income economies with high labor costs, these countries have leveraged automation, niche specialization, nearshoring, and high-value design segments to maintain their market presence.

Germany increased its apparel exports from USD 12 billion to USD 28 billion, growing at 4.76% CAGR and retaining its 4th rank. Its global share grew from 4.35% to 5.31%, signaling strength in quality-focused and premium segments. Italy, while experiencing slower growth (2.44% CAGR), saw exports rise from USD 18 billion to USD 28 billion. Its share declined from 6.55% to 5.24%, and it dropped in ranking from 3rd to 5th. Nevertheless, Italy's luxury and heritage fashion sectors remain globally influential.

Türkiye posted USD 17 billion in 2024 exports, up from USD 11 billion in 2005, with a CAGR of 2.25%. Its global share slipped slightly from 4.25% to 3.28%, and its rank moved from 5th to 6th. France increased exports from USD 8 billion to USD 15 billion, with 3.41% CAGR. Its share decreased modestly from 2.99% to 2.86%, though it maintained a respectable 8th position in global rankings.

Netherlands, with 7.1% CAGR, saw apparel exports grow from USD 4 billion to USD 14 billion, and its global share increased from 1.39% to 2.59%, improving its rank from 17th to 9th, a clear example of the rising importance of re-export hubs and regional consolidation in Europe.

Poland was another standout, with a CAGR of 10.28%. Apparel exports rose from USD 2 billion to USD 14 billion, and its share climbed from 0.79% to 2.57%, pushing it from 28th to 10th, an extraordinary ascent, possibly driven by integration with EU supply chains and growing technical apparel exports. Spain, too, grew steadily at 6.37% CAGR, expanding

exports from USD 4 billion to USD 14 billion. It moved from 16th to 11th in the global rankings, reflecting its strength in fast fashion and regional sourcing networks.

These performances highlight that Europe, despite its high income status, has not retreated from apparel manufacturing. On the contrary, these countries are using advanced manufacturing, branding, sustainability, and nearshoring to remain relevant and preserve employment in a traditionally labor-intensive sector.

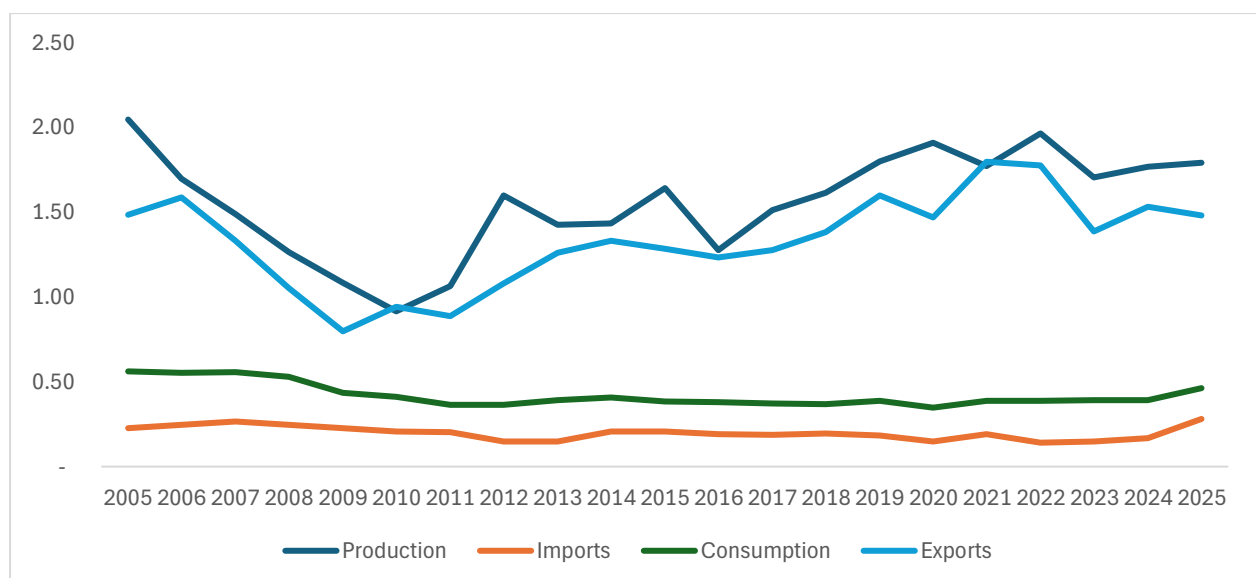
The global apparel trade between 2005 and 2024 reflects a dynamic interplay of cost competitiveness, policy frameworks, trade access, consumer proximity, and technological adaptation. While China remains dominant, countries like Bangladesh, Vietnam, and Poland have emerged as fast-growing alternatives. Meanwhile, European exporters have shown resilience, proving that value and innovation can counterbalance cost disadvantages.

As the industry heads into an era defined by sustainability demands, digital supply chains, and regulatory changes, these trends will continue to evolve. Emerging economies will need to balance scale with compliance, while established ones must innovate to retain market share. What remains clear is that apparel remains one of the most globalized and geographically diverse sectors in world trade.

Africa's Cotton Production and Its Role in the Global Apparel Market

While many leading apparel exporters such as Bangladesh, Vietnam, Germany, Italy, the Netherlands, Cambodia, and Belgium have little or no domestic cotton production, Africa has been a significant cotton producer for decades. Yet, despite this long-standing position, the continent's share in global apparel exports remains modest. Understanding why requires examining Africa's cotton production, consumption, and trade trends to identify the underlying challenges and untapped opportunities.

Table 6: Africa Cotton Statistics in Million Tons



Over the past two decades, Africa's cotton production has fluctuated but remained relatively stable, peaking at 1.80 million tons in 2019. The overall trend shows a marginal decline, with a CAGR of -0.67%. The 2024 estimate of 1.77 million tons suggests a possible

recovery after recent dips, though production remains vulnerable to climatic variability, input costs, and market volatility.

Cotton imports have been minimal compared to production, with a modest CAGR of 1.10% and occasional spikes the highest in 2025 at 0.28 million tons. These imports reflect the needs of certain countries where domestic output does not meet consumption requirements.

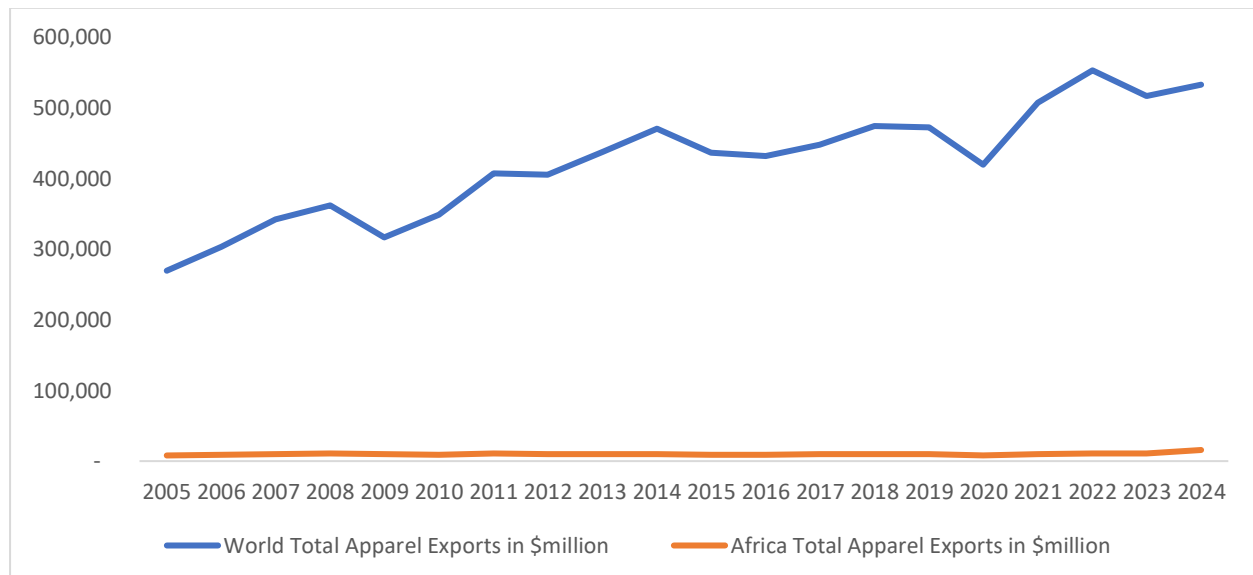
Domestic consumption has followed a declining path, falling from a peak of 0.56 million tons in 2005 to a projected 0.46 million tons in 2025 (CAGR -0.98%). This level of utilization is low by global standards, indicating limited downstream textile capacity despite growing populations and rising consumer markets in parts of the continent.

Exports, largely in raw fiber form, remain a core feature of Africa's cotton trade. Shipments peaked at 1.80 million tons in 2021 but have since declined slightly, with a CAGR of -0.02%. While Africa maintains a significant role in global cotton supply, the lack of domestic value addition limits its ability to capture higher margins and build competitive apparel industries.

Africa's Share in Global Apparel Exports

Africa produces an average of 1.6 million tons of cotton annually, exporting around 1.3 million tons, approximately 80% of its output. By contrast, Bangladesh imports 1.8 million tons of cotton yet generates apparel exports worth USD 51 billion. This stark disparity underscores the urgent need for Africa to move beyond raw fiber exports and develop robust domestic textile and apparel manufacturing to capture more value.

Table 7: Africa Apparel Exports Compared to World in \$million



From 2005 to 2024, global apparel exports nearly doubled, rising from USD 269.5 billion to USD 533.2 billion (CAGR 3.66%). Africa's apparel exports followed a similar upward trend, growing from USD 8.33 billion in 2005 to an estimated USD 15.72 billion in 2024 (CAGR 3.40%). While the growth rate is close to the global average, Africa's 2024 share of world apparel exports is just 2.95%, modest given its long-standing cotton production base.

Within Africa's total apparel exports, woven goods dominate. Woven apparel exports increased from USD 5.56 billion in 2005 to USD 10.64 billion in 2024, lifting Africa's share

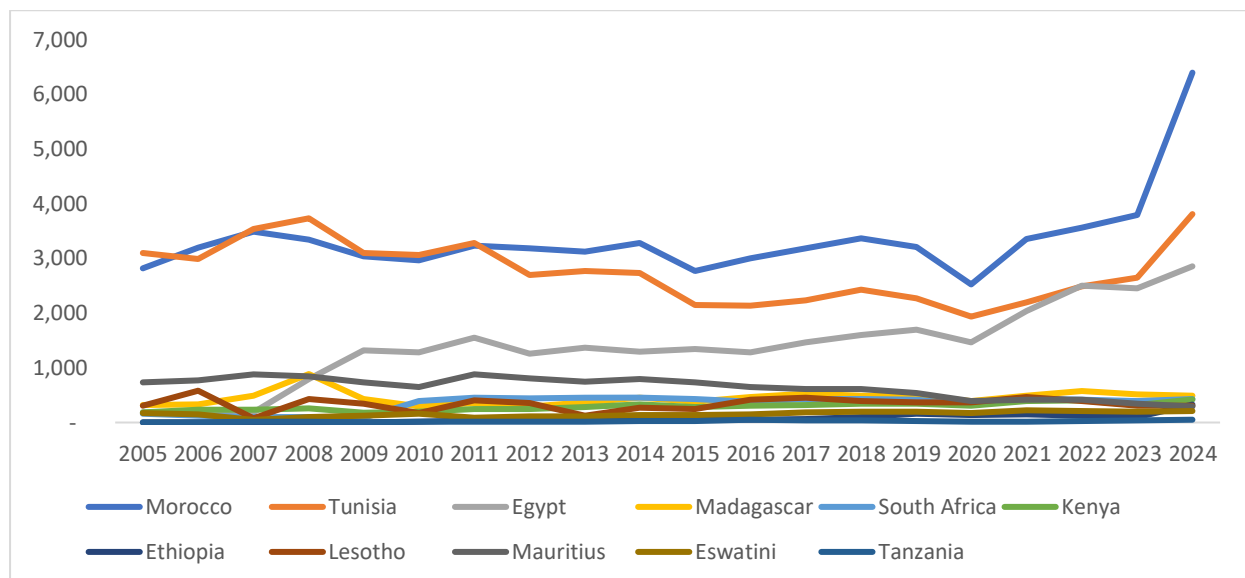
of global woven apparel trade to 3.80%. This segment demonstrates the region's relative strength, though performance has been uneven year-to-year.

Knit apparel growth has been slower. Africa's share of global knit apparel exports rose from 2.01% in 2005 to 2.95% in 2024, with values increasing from USD 2.77 billion to USD 5.09 billion over the same period. While progress is evident, knitwear capacity remains less developed compared to woven apparel. In short, the continent's presence in global apparel markets remains small though significant opportunities exist to expand both woven and knit segments.

Top Apparel Export Performers in Africa

Following the analysis of Africa's overall cotton and apparel trade, it is important to identify the countries driving the continent's apparel exports. While cotton production is widespread across Africa, the degree of value addition through textile and apparel manufacturing varies sharply by country. Concentrating on the top performers provides clarity on where capacity is strongest, how export shares have shifted over time, and which markets these countries are best positioned to serve.

Table 8: Top Apparel Exporting Countries in Africa in \$million



Africa's apparel exports are heavily concentrated in a small number of countries, with Morocco, Tunisia, and Egypt together accounting for more than 80% of the total in 2024. The rest is distributed among smaller but still significant players such as Madagascar, South Africa, Kenya, and emerging exporters like Ethiopia and Tanzania.

Morocco remains Africa's largest apparel exporter, increasing shipments from USD 2.81 billion in 2005 to USD 6.40 billion in 2024 (CAGR 4.42%). Its share of Africa's apparel exports rose from 33.77% to 40.68%, and its global market share improved to 1.20%.

Tunisia, while still the second-largest exporter, saw slower growth, with exports rising from USD 3.09 billion to USD 3.81 billion (CAGR 1.10%). Its share fell from 37.14% to 24.23%, reflecting competition from lower-cost suppliers.

Egypt recorded the fastest growth, climbing from USD 183 million to USD 2.85 billion (CAGR 15.55%). Its share surged from 2.20% to 18.16%, supported by vertical integration, strong cotton supply, and trade preferences with the U.S. and EU.

Madagascar grew from USD 325 million to USD 494 million (CAGR 2.24%), maintaining a niche in mid-range garments for U.S. and EU markets under AGOA. South Africa expanded from USD 159 million to USD 428 million (CAGR 5.34%), though higher costs keep its share modest at 2.72%. Kenya increased from USD 184 million to USD 421 million (CAGR 4.44%), mainly supplying U.S. brands with knitwear and uniforms.

Ethiopia rose sharply from USD 3 million to USD 328 million, driven by industrial parks and foreign investment, capturing 2.08% of Africa's exports. Lesotho remained volatile, with minimal growth to USD 304 million, its share falling from 3.63% to 1.93%. Mauritius declined from USD 739 million to USD 293 million (CAGR -4.76%), shifting toward higher-value, lower-volume orders. Eswatini increased marginally to USD 207 million (CAGR 0.90%), serving niche U.S. markets under AGOA.

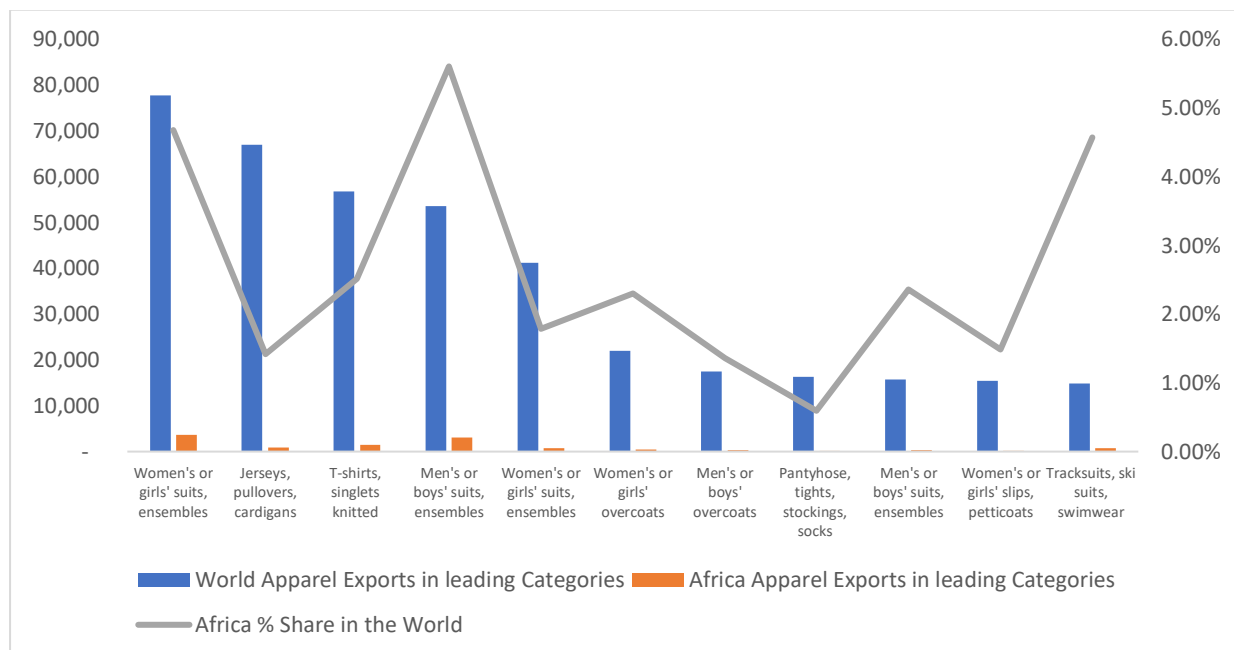
Tanzania, while still small at USD 51 million in 2024, posted a strong CAGR of 11.87%, showing potential if industrial investment accelerates.

Examining these national performances highlights the uneven distribution of Africa's apparel export capacity, with most value concentrated in North Africa and a few Sub-Saharan hubs. This breakdown also signals where targeted investment, trade facilitation, and policy reforms could most effectively boost Africa's competitiveness and diversify its export base.

Africa's Apparel Export Performance in Leading Global Product Categories

To accurately gauge Africa's standing in the global apparel market, it is essential to assess its performance in the key product categories that dominate world trade. Analyzing export values, market shares, and growth trends in these high-demand segments provides a clear picture of the continent's competitive strengths, existing gaps, and untapped opportunities. This approach not only pinpoints the apparel segments where Africa holds a relative advantage but also highlights areas where targeted investment, supportive policy frameworks, and capacity-building initiatives could generate the greatest gains in global market share.

Table 9: Africa Exports in Leading World Apparel Categories in \$million



African apparel exports show a highly uneven performance when measured against the world's leading apparel categories. While the overall values remain modest compared to total global exports, certain product segments reveal competitive strengths. The most notable are women's or girls' suits and ensembles at USD 3.64 billion (4.68% global share), men's or boys' suits and ensembles at USD 2.99 billion (5.60%, the highest share across all categories), and tracksuits, ski suits, and swimwear at USD 677 million (4.57%). These indicate strong potential in formalwear and activewear niches.

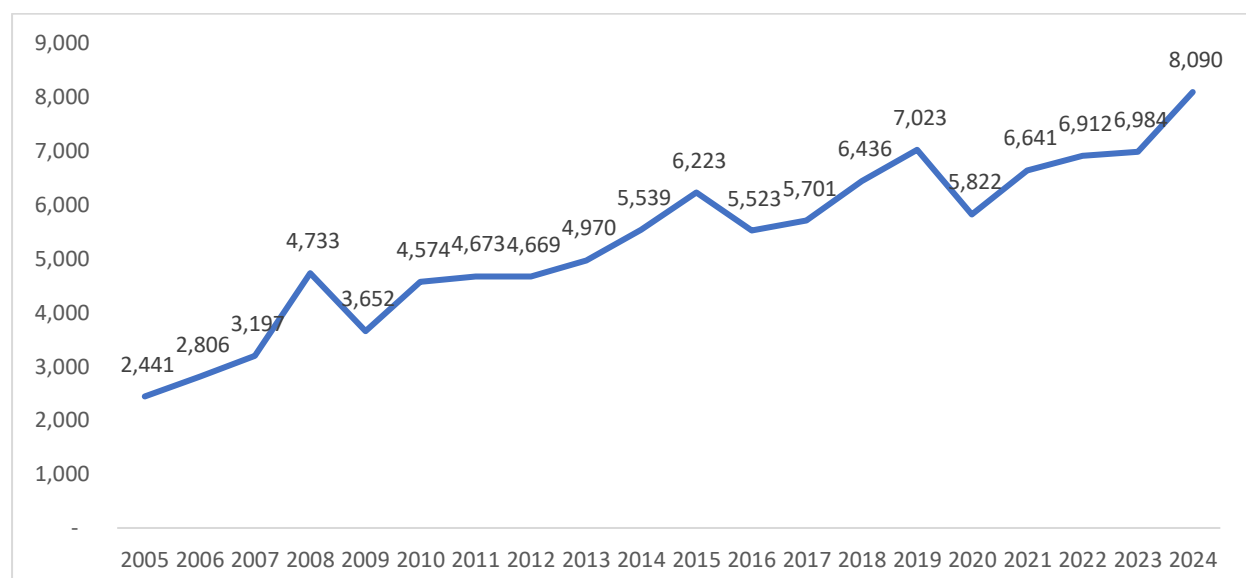
In contrast, Africa's market share is significantly lower in several high-value global categories. Jerseys, pullovers, and cardigans, worth USD 67 billion globally, register only a 1.42% African share. T-shirts and knitted singlets, a USD 56.8 billion market, account for just 2.52% from Africa, while hosiery items (pantyhose, tights, stockings, and socks) represent the weakest performance at 0.59%.

Mid-range performers, such as women's or girls' overcoats, men's or boys' overcoats, women's slips and petticoats, and men's knitted suits and ensembles, each hold between 1.3% and 2.4% market share. This suggests some production capacity but insufficient scale or competitiveness for significant global impact.

Overall, Africa demonstrates clear competitive positioning in select formalwear and activewear segments but remains underrepresented in high-demand casualwear, knitwear, and hosiery markets. Addressing these gaps will require targeted investment, capacity building, and value chain integration to grow production in large-volume global categories where current African participation is low.

While exports reflect Africa's growing participation in global apparel supply chains, import trends provide equally important insights into the continent's consumption dynamics, domestic production gaps, and market potential. Apparel imports often signal rising demand among Africa's expanding middle class, shifts in fashion preferences, and the influence of trade agreements that shape sourcing patterns. Examining these trends helps identify opportunities for local manufacturing to substitute imports, attract investment, and strengthen intra-African trade under frameworks such as the African Continental Free Trade Area (AfCFTA).

Table 10: Africa Apparel Imports in \$million



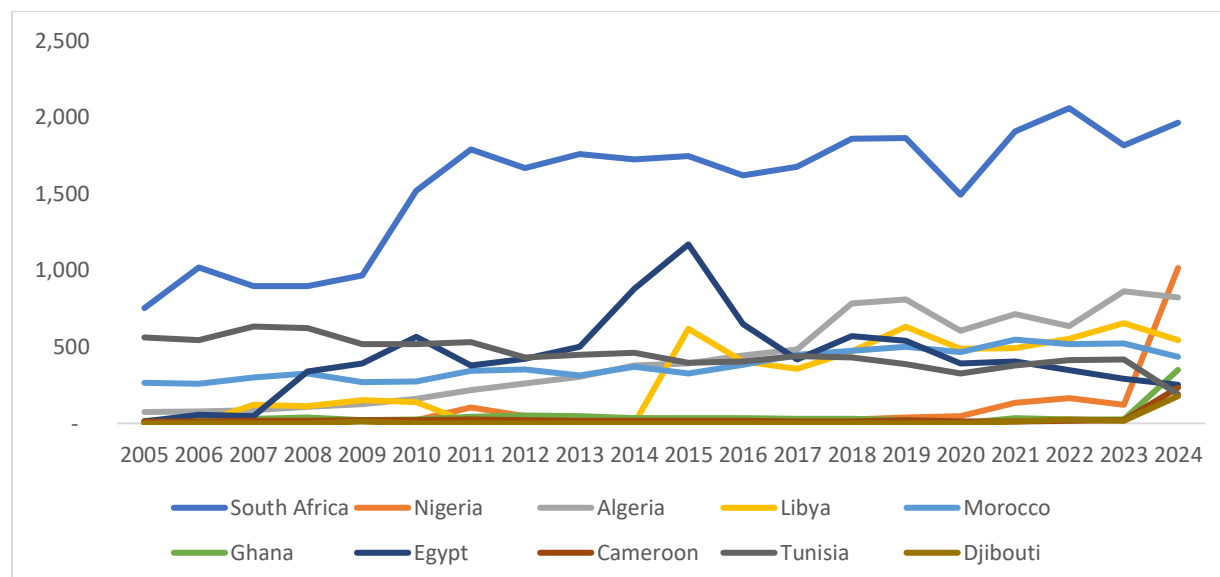
Africa's apparel imports have grown steadily over the past two decades, rising from USD 2.44 billion in 2005 to USD 8.09 billion in 2024, representing a compound annual growth rate (CAGR) of 6.51%. The growth trajectory shows three distinct phases. Between 2005 and 2008, imports expanded rapidly, nearly doubling in just three years, driven by rising consumer demand and urban market growth. However, the 2009 global financial crisis led to a sharp contraction, with imports falling by over USD 1 billion. Recovery was swift, and from 2010 to 2019, the market maintained a largely upward trend, supported by improving economic conditions, growing middle-class populations, and increased retail penetration across the continent.

The pandemic in 2020 caused another downturn, with imports falling to USD 5.82 billion, but the rebound was robust, and by 2024 Africa's apparel import market reached its highest recorded value. The consistent post-pandemic recovery underscores the resilience of African consumer markets and the ongoing structural shift toward greater consumption of imported apparel. With a CAGR of over 6.5% across two decades, the region's import growth outpaces many other developing markets, highlighting Africa's expanding role as a consumer-driven apparel market and a potentially lucrative destination for global apparel exporters.

Africa's Apparel Imports and Country-Level Market Shares

Having reviewed Africa's apparel export performance and its competitive positioning in key global product categories, it is equally important to examine the continent's apparel import trends. These trends offer valuable insights into domestic consumption patterns, evolving market demand, and the balance between local manufacturing capacity and reliance on foreign suppliers. Tracking import growth over time also sheds light on Africa's shifting retail landscapes, as urbanization, rising incomes, and changing fashion preferences drive consumer markets across the continent.

Table 11: Africa's Leading Apparel Importer Countries in \$million



Between 2005 and 2024, Africa's apparel imports increased significantly, from USD 2.44 billion to USD 8.09 billion, representing a compound annual growth rate (CAGR) of 6.51%. This growth outpaced the continent's apparel export CAGR of 3.40%, highlighting that domestic demand for clothing is expanding faster than export capacity.

At the country level, South Africa dominates imports, with USD 1.97 billion in 2024, accounting for 24.28% of Africa's total apparel imports. Its relatively high per capita income, developed retail sector, and diverse fashion market make it a primary destination for international brands. Nigeria has emerged rapidly, with imports rising to USD 1.01 billion in 2024 i.e. 12.53% of Africa's total, reflecting its large population, expanding middle class, and limited domestic manufacturing capacity.

Algeria ranks third, with imports of USD 822 million in 2024 (10.16% share), showing robust growth at a CAGR of 13.50%, driven by demand for both casualwear and formalwear. Libya, despite political and economic volatility, recorded USD 543 million in imports (6.71% share), while Morocco imported USD 434 million worth of apparel (5.36%), partly due to its role as both a producer and a consumer market.

Smaller but fast-growing markets include Ghana (USD 349 million, CAGR 17.13%), Egypt (USD 251 million, CAGR 17.05%), and Cameroon (USD 233 million, CAGR 17.45%), each showing double-digit import growth, reflecting rising consumer demand and evolving retail landscapes. Tunisia is a notable outlier, with imports declining to USD 190 million in 2024 (-5.54% CAGR), possibly due to a stronger domestic apparel production base serving local needs. Djibouti, though small, has seen imports grow to USD 178 million (2.20% share), underscoring its role as a trade and logistics hub.

Africa's Strategic Advantages

Africa possesses a unique combination of advantages that position it as a potential powerhouse in global apparel production and trade. The continent benefits from a young and expanding labor force, competitive wage levels, and abundant home-grown cotton in many countries, a key raw material that reduces import dependency and strengthens local value chains.

Equally important, global trade dynamics are shifting, with buyers increasingly seeking diversified sourcing beyond traditional hubs. Most African nations already enjoy preferential market access to the world's largest economies through frameworks such as the African Growth and Opportunity Act (AGOA), Economic Partnership Agreements (EPA), and the Generalized System of Preferences (GSP) – including the Everything But Arms (EBA) initiative.

These agreements offer duty-free or reduced-tariff entry into markets like the European Union and the United States, providing African exporters with a strong competitive edge.

At the regional level, the African Continental Free Trade Area (AfCFTA) presents unprecedented opportunities for intra-African trade and the creation of integrated regional value chains.

Imperative for a Textiles and Apparel Policy

The development of a competitive textiles and apparel sector in Africa cannot be left to market forces alone; it requires a deliberate, coherent, and long-term policy framework. This is because textiles and apparel form an industrial value chain that is fundamentally different from cotton, which is primarily an agricultural commodity. While cotton production focuses on growing and harvesting raw fibre, textiles and apparel involve complex industrial processes such as spinning, weaving, knitting, dyeing, finishing, apparel manufacturing, branding, and distribution. These stages demand substantial capital investment, advanced technology, skilled labor, and strict compliance with international quality and sustainability standards, making the sector's development far more challenging than improving agricultural yields.

Understanding this distinction is crucial for designing policies that address the sector's specific needs. Global experience shows that without a predictable policy environment, even countries with strong raw material bases and low labor costs struggle to build scale, attract investment, and secure long-term sourcing commitments from international buyers.

Bangladesh provides a clear example: the establishment of a dedicated Ministry of Textiles and Jute in 1978 and the adoption of its first textiles policy in 2000 created the institutional stability and investor confidence that fueled its rapid export growth. Pakistan followed a similar path, creating a dedicated Ministry of Textiles in 2004 and introducing its first textiles policy in 2009, a framework that helped its apparel exports triple to reach 9 billion USD.

Ultimately, the effectiveness of any textiles policy will depend on a fact-based understanding of the sector's current realities and structural requirements. Unlike cotton, textiles and apparel intersect with multiple economic sectors, including logistics, infrastructure, finance, and trade policy. Therefore, before defining the policy framework, it is critical to establish an accurate picture of existing capabilities, competitiveness, and the key enablers needed to close the gap between potential and performance.

Textiles and Apparel Policy - Prerequisites

Before embarking on the drafting of a textiles and apparel policy, it is essential to undertake a comprehensive and objective assessment of the cotton-textiles-apparel value chain to fully understand the factors constraining its growth. This assessment should quantify the current scale of the industry, identify historical bottlenecks, and map both the opportunities and challenges shaping the sector's trajectory. The review must evaluate existing market access, historical and current industrial growth patterns, resource availability, installed machinery base, industrial infrastructure, and production lead times. A robust situational analysis will provide the factual foundation for sound policy formulation.

This process should be supported by wide-ranging stakeholder consultations. At the federal level, relevant ministries / departments including Finance, Commerce, Industries Agriculture, Industries, Planning, and Economic Affairs, along Department responsible for Revenue, should be engaged. Provincial or state governments, trade bodies, and industry associations must be included, complemented by regional consultations with the private sector, labor representatives, academia, and training institutions to ensure all perspectives are captured.

Equally important is the identification of domestic constraints, including regulatory frameworks, taxation systems, levies, and the overlapping roles of government departments at federal, provincial, and local levels. Infrastructure readiness, skills development capacity, education and training facilities, and technological capabilities must also be examined to identify systemic gaps.

Competitor Analysis – Regional and International Benchmarks

The diagnostic should also incorporate a detailed competitor analysis at both regional and international levels. This should include an assessment of global market trends, the incentive frameworks of leading textile-producing nations, and the "pull factors" that attract global buyers to competing destinations. Benchmarking should cover preferential market access arrangements, trade agreements, production capacities, cost competitiveness, quality standards, and lead times etc.

Such comparative analysis will help position the national industry within the global value chain, identify areas of competitive advantage, and pinpoint capability gaps that must be addressed to compete effectively in export markets.

Cost of Doing Business

The overall cost of doing business is the most decisive factor in determining a country's competitiveness in the textiles and apparel sector. It encompasses the cumulative effect of utility tariffs, labor expenses, financing rates, tax structures, compliance costs, and logistics efficiency. In a highly cost-sensitive industry, even small differences in operational expenses can shift sourcing decisions for major buyers. Countries that maintain a favorable cost structure backed by predictable regulatory frameworks are able to attract investment, expand capacity, and integrate more deeply into global supply chains. Conversely, high costs combined with inefficiencies can erode margins and deter both domestic and foreign investors.

Electricity Costs and Shift to Alternate Energy Source

Electricity is the lifeblood of textiles manufacturing, powering spinning frames, weaving looms, knitting machines, dyeing units, finishing plants, and garment factories. In many countries, energy expenses account for 8–10% of total production costs, with energy-intensive segments such as dyeing and finishing depending heavily on uninterrupted power supply. A competitive textiles policy must therefore prioritize industrial electricity tariffs that are globally benchmarked, stable, and predictable, while also ensuring grid reliability to avoid the high costs associated with backup power generation. Countries that have maintained industrial tariffs in the range of \$0.06–\$0.08 per kWh have demonstrated stronger export competitiveness, as predictable pricing enables better cost control and investment planning.

In the current compliance-driven era particularly in meeting Paris Agreement targets, the textiles and apparel industry is increasingly adopting renewable and alternative energy solutions. Solar, wind, biomass, and other clean energy technologies are being integrated into manufacturing facilities to reduce reliance on conventional fuels, cut carbon emissions, and enhance long-term energy security. Such a transition not only addresses sustainability imperatives but also mitigates the risks of fluctuating fossil fuel prices, positioning the sector for resilience and green growth.

Natural Gas / RLNG

Gas plays a critical role in textiles and apparel manufacturing, providing thermal energy for processes such as boilers, dryers, and heat-setting machines, as well as generating power through captive plants. In competitive markets, industrial gas prices, both for process use and captive power generation are maintained at cost-effective levels, often ranging from \$2 to \$12 per MMBtu, through a combination of domestic production, targeted incentives, and preferential industrial tariffs. A reliable and affordable gas supply lowers production costs in thermal operations, enhances operational stability, and reduces the risk of delays in fulfilling export commitments. Conversely, when gas is costly or unavailable, manufacturers are compelled to switch to alternatives such as furnace oil or diesel, which are significantly more expensive and carry higher environmental impacts.

Financing Rates and Access to Capital

Access to affordable financing is one of the most decisive factors in enabling the textiles and apparel industry to modernize operations, expand production capacity, and integrate new technologies. Given the sector's long capital investment cycles and repayment periods

often exceeding five years to twelve years both short-term and long-term financing solutions are essential.

Short-term financing, such as working capital loans, export financing, and pre- and post-shipment credit, supports day-to-day operations, raw material procurement, and timely order fulfillment. Competitive interest rates and simplified access to these facilities are crucial for maintaining liquidity and ensuring uninterrupted production, especially in export-oriented segments.

Long-term financing is vital for investments in advanced machinery, infrastructure upgrades, and expansion projects. Countries offering low-interest, long-tenure financing for export-oriented industries have been able to modernize rapidly, enhance productivity, and diversify product offerings. In leading textile hubs, long-term industrial credit is available at 3–7% per annum, while short-term export credit can be as low as 3–5%, compared to rates exceeding 12–14% in less competitive markets.

Special incentives should target projects that contribute to sustainability and competitiveness. These may include concessional financing for: Establishing green factories, Adopting renewable energy and alternative fuels, Installing water- and energy-efficient machinery and Implementing process automation and digital manufacturing technologies.

Special focus on SMEs is critical, as they often form the backbone of the apparel value chain but face the greatest difficulty in accessing affordable finance. Dedicated SME credit lines, simplified collateral requirements, and risk-sharing guarantees can enable smaller firms to upgrade technology, achieve compliance certifications, and integrate into export supply chains.

By aligning financing incentives with modernization, sustainability, and SME growth, a textiles policy can stimulate investment, enhance competitiveness, and ensure a more inclusive distribution of benefits across the value chain.

Tax Incentives

Tax structures play a decisive role in shaping profitability, guiding investment flows, and determining the speed at which a textiles and apparel value chain can develop. Globally competitive countries often deploy targeted fiscal measures to attract capital, stimulate exports, and encourage modernization.

Common approaches include tax holidays for new investments, reduced corporate income tax rates for export-oriented units, VAT refunds on export sales, accelerated depreciation allowances for capital equipment, and exemptions from certain local levies. These measures reduce the initial cost of setting up operations, shorten payback periods, and free up working capital for reinvestment.

Importantly, the most effective tax frameworks are clear, predictable, and transparent, giving both domestic and foreign investors the confidence to commit long-term capital. A forward-looking textiles policy should ensure globally benchmarked and stable tax rates for the sector and offer performance-linked tax credits for firms achieving export growth, sustainability certifications, or technology upgrades.

Import Tariff and Temporary Import Schemes

Import tariffs directly affect the cost of raw materials, intermediate goods, and machinery, influencing the competitiveness of textiles and apparel production. Competitive nations often provide duty-free or concessional tariffs on the import of fabrics, accessories, dyes, chemicals, and advanced machinery, enabling faster scaling of value-added

manufacturing. Tariff-free access to intermediate goods and production machinery has been instrumental in allowing advanced textile-producing nations to expand capacity rapidly and integrate into global supply chains. By contrast, high tariffs and unpredictable enforcement can discourage investment, inflate production costs, and undermine export competitiveness.

Alongside tariff incentives, temporary import schemes such as bonded warehouses, inward processing reliefs, and customs duty drawback facilities are critical tools for export-oriented manufacturers. These mechanisms allow the import of raw materials, fabrics, trims, and accessories without paying duties or taxes, provided they are used in the production of goods for export. This significantly reduces working capital requirements, shortens production lead times, and ensures access to a wider range of inputs that may not be available locally.

When designed with clear procedures, minimal bureaucracy, and robust compliance mechanisms, these combined measures lower production costs, improve operational efficiency, and strengthen a country's ability to compete in regional and global markets. For many successful apparel-exporting nations, the integration of tariff exemptions with efficient temporary import schemes has been a cornerstone policy for building export capacity and embedding themselves in global value chains.

Labor Costs, Skills Development and Productivity

Labor is one of the largest cost components in apparel manufacturing, particularly in labor-intensive garment assembly. Competitive countries maintain minimum monthly wages in the range of \$100–\$150 while simultaneously investing in skills development to enhance productivity. The balance between fair wages and productivity is critical, as higher wages can be sustained if matched by greater efficiency, better technology adoption, and reduced waste.

The textiles sector is a major source of employment, and scaling up its capacity to process 1.2–1.5 billion meters of fabric annually across a range of fabric types and apparel categories, could generate around 300,000 industrial jobs within the textiles value chain. The bulk of this workforce, approximately 250,000 jobs, would be concentrated in labor-intensive apparel manufacturing. Meeting such a demand will require a nationwide mass training initiative that blends factory-based, on-the-job learning with structured classroom instruction. Vocational schools can act as hubs for preparing master trainers, while close collaboration with industry and development partners will ensure training programs remain responsive to evolving market needs. This integrated approach will enable rapid workforce expansion while safeguarding quality, productivity, and compliance standards.

Compliance – Domestic and International

Compliance with international labor, safety, and environmental standards is now a non-negotiable requirement for accessing premium global markets. The textiles and apparel sector must meet a wide range of recognized certifications covering social accountability, worker safety, environmental sustainability, and product quality. Specific certifications vary by buyer, requiring manufacturers to remain agile and responsive to diverse and evolving compliance demands.

While adherence to international standards is essential, an efficient, predictable, and transparent domestic regulatory framework is equally critical. Streamlined national regulations on social and environmental issues not only reduce administrative burdens for manufacturers but also ensure alignment between local laws and global compliance expectations. Since international buyers are obligated to comply with both their own

sourcing standards and the laws of the country of production, a robust and well-enforced domestic regulatory system enhances credibility, facilitates market access, and strengthens the sector's competitive position.

Logistics

Efficient logistics are essential to keeping lead times competitive in the global apparel market. This includes well-maintained roads, efficient ports, reliable rail and air freight systems, and integrated digital tracking systems. Poor infrastructure or congested trade routes can increase shipment costs, delay deliveries, and cause buyers to shift orders to more reliable suppliers. Investment in logistics infrastructure especially dedicated textile and apparel export corridors can significantly reduce the cost and time involved in moving goods from factory to market.

Special Economic Zones (SEZs), Integrated Industrial Parks, Plug & Play Apparel Manufacturing, Product Development Centers and Testing Laboratories

Special Economic Zones (SEZs) and industrial parks dedicated to the textiles sector can serve as powerful catalysts for rapid industrial growth. Equipped with dedicated infrastructure, fiscal incentives, and streamlined operational procedures, these zones should operate under a single-window clearance system to handle all approvals and permits through one point of contact, significantly reducing setup times and administrative burdens. Strategically locating SEZs in cotton-growing regions and integrating them with efficient logistics corridors comprising roads, rail, ports, and dry ports will lower transportation costs, improve supply chain efficiency, and enable vertically integrated value chains from raw cotton to finished apparel.

Well-designed industrial parks should include common facilities such as effluent treatment plants, captive power generation or alternate energy systems, and waste management services, which lower both the cost of investment and production for individual units. SEZs also offer advantages such as tax exemptions, preferential financing, and duty-free import of machinery and raw materials.

To further promote apparel manufacturing and encourage small and medium enterprise (SME) participation, plug-and-play factory units can be developed within these zones, allowing new entrants to start operations quickly without heavy upfront capital investment. By aligning legal certainty, fiscal benefits, shared infrastructure, and modern facilities, SEZs and industrial parks can provide an investor-friendly environment that drives sustainable growth across the textiles value chain.

Product development centers, accredited testing laboratories, and on-site regulatory agencies offering one-stop compliance services can also be embedded into these parks, further streamlining operations and reducing delays.

Marketing and Branding

A well-designed marketing and branding strategy is essential to position a country's textiles and apparel industry as a credible and competitive force in global markets. This begins with a national branding campaign that communicates a clear identity and value proposition, highlighting strengths such as quality, innovation, sustainability, craftsmanship, and cultural heritage. The campaign should be backed by consistent messaging across international platforms, ensuring that global buyers associate the country's products with reliability and distinctiveness.

Government-backed support for industry participation in major international trade fairs is critical to this effort, enabling direct engagement with high-value buyers, sourcing agents,

and distributors. To reinforce visibility, the establishment of an annual national textiles and apparel expo paired with targeted international buyer outreach can serve as a flagship event to showcase capabilities, foster partnerships, and attract investment.

Complementary initiatives should include structured B2B matchmaking programs, trade missions to strategically selected markets, and the creation of digital engagement platforms that provide year-round access to product catalogues, supplier databases, and virtual sourcing events.

These measures will not only raise brand recognition but also build long-term buyer confidence, helping to transition the textiles and apparel sector from being perceived as a supplier of commodity goods to being recognized as a source of premium, differentiated offerings. A strong, consistent brand identity reinforced by proactive marketing can secure a lasting and competitive position in global value chains.

Drawback Regime and Creating a Level Playing Field

To elevate the global competitiveness of the textile sector, it is essential to address structural constraints such as limited availability of key raw materials, absence of economies of scale, incomplete integration of the textiles value chain, high operational costs, and reliance on imported inputs in the early stages of development. These challenges, compounded by a shortage of skilled labor and the underdevelopment of allied industries, such as dyes, chemicals, trims, and accessories, often place domestic exporters at a disadvantage compared to international competitors. Additional constraints, including restricted access to spare parts, specialized inputs, and the prevalence of small-scale production, further increase operational costs, as manufacturers are often compelled to maintain large inventories of imported materials to safeguard against supply disruptions.

A targeted and transparent drawback regime can play a pivotal role in neutralizing these disadvantages by reimbursing or offsetting eligible costs directly associated with export production. Such a system should be designed to cover all disadvantageous costs that undermine competitiveness, tailored to specific product categories to ensure relief measures are proportionate to the actual competitive gaps identified. A comprehensive, data-driven analysis should guide the scope, eligible inputs, and rebate levels, ensuring maximum impact. Properly structured, these schemes can also stimulate export diversification and encourage the development of a broader range of value-added products, enabling manufacturers to access new markets and reduce dependence on a narrow set of product lines.

Advancing Competitiveness Across All Stages of Development

While the measures outlined are important, they represent only a portion of the wide-ranging actions still required to fully strengthen the textiles and apparel sector. They are intended to catalyze a sustained and inclusive dialogue among ICAC member countries, recognizing that each is at a different stage of development, ranging from those with minimal textiles and apparel capacity, to those with established industries, and a select few operating at advanced levels. Regardless of their starting point, every member possesses significant potential to enhance competitiveness and capture greater value from their resources.

For African cotton-producing countries in particular, there is an urgent need to prioritize integrated value chain development and, where relevant, adopt semi-processed or finished fabric-forward models. Moving beyond the export of raw materials toward higher-value, export-oriented manufacturing will create durable industrial jobs specially for women and youth while unlocking broader socio-economic benefits. While this article provides an

overview of the apparel value chain and critical competitiveness measures, we will be presenting more in-depth analyses on other priority topics, including the full scope of circularity, sustainability and sectoral policy measures for the textiles and apparel value chain. Textiles and apparel value chain may appear straightforward, but it is in fact one of the most complex and multifaceted industries, requiring coordinated action across agriculture, manufacturing, trade, technology, and sustainability.

Realizing this vision demands a deliberate and sustained commitment from governments to provide an enabling environment. This includes improving ease of doing business, investing in strategic infrastructure, and addressing cost disadvantages through targeted measures. Lowering the cost of doing business, ensuring the ready availability of inputs, offering tax concessions to offset production expenses, and introducing incentives to stimulate domestic production will reduce manufacturing costs, encourage industrial diversification, and establish a stronger foundation for long-term competitiveness.

The work is challenging and requires unwavering commitment, but the rewards are immense: bringing high-quality industrial jobs to people's doorsteps and building the economic foundations of a prosperous, high-income nation. The strategic importance of the textiles and apparel value chain as a driver of economic transformation is well established. Among the world's top 15 apparel exporters, eight are high-income European countries. a clear testament to the sector's capacity to generate large-scale employment, sustain industrial growth, and underpin enduring national prosperity.

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