



GOING FOR GREEN

SUSTAINABILITY SOLUTIONS
FOR EAST AFRICA'S TEXTILE
AND LEATHER SECTORS

TECHNICAL REPORT

Cover pictures:

front: (cc) Image by Free-Photos from Pixabay
(cc) Make It Kenya Photo / Stuart Price

back: (cc) Make It Kenya Photo / Stuart Price



GOING FOR GREEN

Sustainability Solutions for East Africa's
Textile and Leather Sectors

PREFACE

The global fashion sector is seeing a marked shift towards more sustainable supply chains. Large international brands are leading the change, requiring their suppliers to adhere to increasingly stringent environmental standards. At the same time, end consumers, with their growing insistence on supporting brands with minimal environmental impact, are driving the shift. These trends have a direct bearing on the competitiveness of East Africa's textile and leather sectors. Governments and business support organizations (BSOs) must, therefore, equip local manufacturers with the capability to comply with international standards on environmental sustainability.

The eligibility to enter the supply chains of most global apparel brands is based on compliance with international environmental standards and practices, put in place by organizations like the Zero Discharge of Hazardous Chemicals (ZDHC) and the Sustainable Apparel Coalition (SAC). The degree of adherence to sustainable production practices and conforming to international standards will determine the competitiveness of the East African leather and textile sectors. Thus, besides the obvious environmental dividends in terms of reduced pollution, there is a clear economic imperative to going green.

At present, in the Federal Democratic Republic of Ethiopia, the Republic of Kenya, the Republic of Rwanda, the United Republic of Tanzania and the Republic of Uganda, information on and understanding of the international standards is often scant among policymakers and BSOs. Infrastructural bottlenecks, poor access to finance, capacity constraints and inadequate implementation of existing environmental regulations compound the problem of attaining sustainable value chains in these countries.

The intended outcome of this report is:

- a. To enable target groups (governments and industry stakeholders) to understand why sustainable production is key for competitiveness of the country, sector and individual manufacturers;
- b. To familiarize target groups with key environmental challenges and solutions in leather and textile production in easy language;
- c. An overview on existing international initiatives;
- d. A set of concise and actionable policy recommendations that can support governments in establishing the physical and regulatory infrastructure for installing sustainable production methods and waste management practices.

While these global standards can act as good references for East African countries to align environmental legislation, special emphasis must be put on the local context and constraints.

The findings in this report are a result of detailed stakeholder engagement exercises with national and international experts. The resulting recommendations consider best practices in the Global South, as well as specific challenges and contribute sustainability gaps in East African countries, towards institutionalizing sustainability in the East African fashion sector. With the right type of support, sustainability and competitiveness objectives can coexist.

About SITA

Supporting Indian Trade and Investment for Africa (SITA) is a project funded by the United Kingdom of Great Britain and Northern Ireland's Foreign, Commonwealth & Development Office (FCDO), implemented by the International Trade Centre (ITC), and runs in 2015–21.

SITA's outcome is to improve the competitiveness of select value chains: textiles and apparel (T&A), pulses, spices, sunflower oil, leather, and emerging sectors of five East African countries (Ethiopia, Kenya, Uganda, Rwanda, and the United Republic of Tanzania) through the provision of partnerships from institutions and businesses from the Republic of India.

The programme's key objective is to increase the value of trade and investment flows between India and the selected African countries to create jobs and income opportunities, while also allowing for technology and knowledge transfer. India is well positioned to improve the productive and export capacities of African partner countries. With the growing importance of South–South cooperation, India's expertise can be leveraged to build trade capacities in African partner countries through the sharing of knowledge, technology and lessons learned.

ACKNOWLEDGEMENTS

We express our gratitude to Kurt Kipka, Jessica Kosak, Sarah Elaine Lewis, K Ramesh, and Mohan Seneviratne for contributing incisive thought pieces on the current industrial trends in sustainability.

Soumyajit Kar led the drafting and design of the report. Anda Valla Efendija and Carolin Averbeck provided valuable support to the stakeholder engagement exercises that informed much of the research for the report.

Siva Ramakumar Pariti provided information on industry standards and contributed to the drafting of the report.

Vanessa Finaughty edited the report. Jesús Alés designed and prepared the copy for printing. Elijah Njenga prepared the illustrations.

Govind Venuprasad supervised the design and preparation of the report.

Special thanks go to Abhishek Bansal, Joy Busolo, Nishat Chowdhury, James Otieno and Chris Wootton for their insightful inputs on the global landscape in wastewater management, and Elena Alonso Esperanza, Carmen Chan, Charles Dickinson, Shariful Hoque, Francesco Pianca and Cen Williams for their valuable inputs on brand requirements.

We thank and appreciate the contributions of Hezekiah Bunde, Girma Gemechu, Steven Niyonzima, Patience Nsereko, Fabien Nshizirungu and Nasra Yusuf towards understanding the current policy challenges in East Africa in implementing sustainability legislation.

We thank Abdul Hakiim Sekandi, Abel Kamau, Allen Kimario, Joseph Kyalimpa, Salim Malalo, Dennis Ndemezo, Goshu Negash, Harryson Rwehumbiza, Georgina Wachuka and Adam Zuku, who provided useful insights on the bottlenecks faced by manufacturers in East Africa.

Most of all, thanks to the United Kingdom's Foreign, Commonwealth & Development Office (FCDO) for funding Supporting Indian Trade and Investment for Africa (SITA).

ACRONYMS AND ABBREVIATIONS

Unless otherwise specified, all references to dollars (\$) are to United States dollars, and all references to tons are to metric tons.

Aii	Apparel Impact Institute
BSO	Business support organization
CETP	Common effluent treatment plant
FDI	Foreign direct investment
GHS	Globally Harmonized System
IFC	International Finance Corporation
MSMEs	Micro, small and medium-sized enterprises
PaCT	Partnership for Cleaner Textile
SAC	Sustainable Apparel Coalition
SDGs	Sustainable Development Goals
SDS	Safety Data Sheet
SITA	Supporting Indian Trade and Investment for Africa
ZDHC	Zero Discharge of Hazardous Chemicals
ZLD	Zero liquid discharge

CONTENTS

PREFACE	II
ACKNOWLEDGEMENTS	IV
ACRONYMS AND ABBREVIATIONS	V
<hr/>	
EXECUTIVE SUMMARY	1
<hr/>	
CHAPTER 1. SUSTAINABILITY AND COMPETITIVENESS: WHERE THE LINK LIES	3
ENVIRONMENTAL IMPACT OF THE TEXTILE AND LEATHER SECTORS.	3
THE NEED FOR SUSTAINABILITY	5
THE FOCUS OF THE REPORT	6
<hr/>	
CHAPTER 2. CHEMICAL AND WASTE MANAGEMENT IN LEATHER AND TEXTILE INDUSTRIES	7
WHAT IS CHEMICAL MANAGEMENT?	7
WHAT IS WASTE MANAGEMENT?	8
CHEMICAL AND WASTE MANAGEMENT PROCESSES.	9
Input management.	9
Process management	11
Output management	13
<hr/>	
CHAPTER 3. WITH BETTER ENFORCEMENT, BUYERS CAN DRIVE THE CHANGE	15
INSIGHTS FROM INTERVIEWS WITH INTERNATIONAL BUYERS.	15
Lack of adequate local legislation.	16
Lack of technical capacity	16
Insufficient policy commitment	16
Technology obsolescence	16
Lack of reliable information	17
<hr/>	
CHAPTER 4. MANUFACTURERS NEED MORE SUPPORT TO GO GREEN	19
INSIGHTS FROM INTERVIEWS WITH MANUFACTURERS IN EAST AFRICA.	19
Enforcement is often counterproductive	20

Inadequate access to information	20
Lack of capacity	20
Lack of financing and long-term planning.	20
Technology obsolescence	21
<hr/>	
CHAPTER 5. NATIONAL STANDARDS IN EAST AFRICA: CURRENT CONSTRAINTS	23
INSIGHTS FROM INTERVIEWS WITH POLICYMAKERS IN EAST AFRICA	23
Lack of comprehensive information on standards	24
Lack of technical capacity	24
Insufficient monitoring and evaluation indicators	24
Insufficient infrastructure and access to finance.	24
<hr/>	
CHAPTER 6. INTERNATIONAL INITIATIVES ON SUSTAINABILITY IN THE LEATHER AND TEXTILE SECTORS	25
MAJOR INTERNATIONAL INITIATIVES ON FASHION SECTOR SUSTAINABILITY	25
ZERO DISCHARGE OF HAZARDOUS CHEMICALS (ZDHC)	26
SUSTAINABLE APPAREL COALITION (SAC)	26
APPAREL IMPACT INSTITUTE (Aii)	27
PARTNERSHIP FOR CLEANER TEXTILE (PACT).	27
SWEDEN TEXTILE WATER INITIATIVE (STWI)	29
LEATHER WORKING GROUP (LWG)	30
ALLIANCE FOR WATER STEWARDSHIP (AWS).	30
<hr/>	
CHAPTER 7. POLICY RECOMMENDATIONS AND BEST PRACTICES	31
RECOMMENDATIONS	31
Recommendations on physical infrastructure development	31
Recommendations for a stronger regulatory environment.	36
Recommendations on capacity building and awareness.	40
Recommendations on creating an enabling environment	44
<hr/>	
ANNEXES	53
ANNEX I	53
Design criteria for an effluent treatment plant	53
Pre-treatment	53
Primary treatment	54
Secondary treatment	54
Tertiary treatment	55
ANNEX II.	56
Recommended limits for wastewater	56

FIGURES

Figure 1: Pollution in the textile industry.	4
Figure 2: Pollution from tanneries and leather processing	5
Figure 3: The need for chemical management in textile mills and tanneries	7
Figure 4: Elements of waste management	8
Figure 5: Purposes of waste management	9
Figure 6: Basic components of a GHS-compliant label	12
Figure 7: Pillars of PaCT.	28
Figure 8: Schematic diagram of a landfill site	36
Figure 9: Recommendations at a glance.	51

TABLES

Table 1: PaCT key aspects.	28
Table 2: Selected wastewater criteria of the STWI guidelines	29

BOXES

Box 1: Recommendations on better chemical management in textile mills and tanneries	37
Box 2: Case study – ALP North Kenya.	47

THOUGHT PIECES

Thought piece 1: Environmental sustainability of the textile dyeing industry	33
Thought piece 2: Collaboration for wastewater treatment – a pathway to sustainability	43
Thought piece 3: Financing sustainability in the textile and apparel sector – challenges and solutions	45
Thought piece 4: Expanding sustainability efforts in the midst of uncertainty	49



EXECUTIVE SUMMARY

Textile and leather are promising sectors in East Africa, thanks to their potential in generating employment, spurring innovation and economic growth, and promoting exports. These sectors have also been prioritized by most governments in the region, in their industrial blueprints, as vehicles on the road to higher incomes. At the same time, these sectors are among the most polluting, impinging on the local environmental quality, especially water resources.

The international leather and textile value chains are making concerted efforts towards going green and reducing their ecological footprint. Most of this change is being driven by large global fashion brands, who require the suppliers in their supply chains to adhere to internationally agreed standards on wastewater and chemical management. For East African businesses, being unable to comply with these standards creates a risk of being left out of global supply chains and represents a high cost in missed export market opportunities. It is thus of paramount importance, both environmentally and economically, to empower East African businesses in improving compliance.

Despite the presence of comprehensive global standards and best practices, such as those promoted by international initiatives like the ZDHC and SAC, an understanding of the necessary steps towards compliance is lacking in East Africa. Local policymakers, enforcement authorities and manufacturers find it difficult to align local legislation with international standards due to this information asymmetry. Even when there is a fair understanding of the sustainability requirements from global brands, poor access to finance and inadequate technical capacity thwart better compliance.

This report has benefitted from an elaborate stakeholder engagement exercise, including interviews with representatives of major global brands, policymakers in East Africa, manufacturers in the East African leather and textile sectors, as well as international experts on sustainability. Chapters 3, 4 and 5 summarize the findings of this exercise, enumerating the challenges faced by each of these stakeholder groups in achieving better compliance.

There are myriad international coalitions and initiatives that are working towards better wastewater and chemical management in the textile and leather value chains. Chapter 6 lists a few of these initiatives that are pertinent to East African policymakers and businesses in better understanding the needs of the industry. As compliance requirements become increasingly strict, attaining the relevant certification attesting to sustainable production practices proves to be a worthwhile investment in attracting international buyers. Many of these initiatives provide internationally recognized accreditation pertaining to specific activities in the value chain, such as sustainable management of effluents.

Based on best practices from other countries in the Global South and interviews with subject experts, and considering the unique challenges towards greening in East Africa, Chapter 7 proposes 16 actionable recommendations for the leather and textile sectors to improve environmental compliance.

Recommendations for infrastructure development

- a. Build integrated industrial sites and industrial parks;
- b. Target effluent harmonization through common effluent treatment plants (CETPs);
- c. Certify testing labs and create a monitoring and database management system for industrial waste;
- d. Undertake accreditation and approval of waste disposal sites.

Recommendations for a stronger regulatory environment

- a. Create a comprehensive and coherent chemical control system;
- b. Demonstrate legislative commitment to enforce and uphold the sustainability legislation;
- c. Incorporate sustainability considerations while attracting foreign direct investment (FDI) – allow only up-to-date technologies and strictly adhere to international environmental requirements;
- d. Allow multi-stakeholder engagement in drafting national standards and in enforcing them.

Recommendations for capacity building and awareness

- a. Institute training programmes on sustainability infrastructure and practices for manufacturers and create a national pool of experts;
- b. Institute capacity building exercises for policymakers and sustainability inspectors;
- c. Sensitize local manufacturers on international sustainability guidelines and the business benefits of compliance;
- d. Collaborate with experts and international stakeholders on creating a sustainability curriculum mindful of the local context and constraints.

Recommendations for creating an enabling environment

- a. Provide appropriate financial incentives and ease access to finance;
- b. Build an effective data collection infrastructure that will aid monitoring and evaluation of sustainability efforts and facilities, and inform enforcement;
- c. Earmark expenditure on physical infrastructure for sustainability and prioritize reducing environmental impact in national industrial development plans;
- d. Partner with relevant international initiatives and organizations to provide a support system for micro, small and medium-sized enterprises (MSMEs) to facilitate greening.

These recommendations are generic to East Africa's leather and textile sectors and apply to Ethiopia, Kenya, Rwanda, the United Republic of Tanzania, and Uganda in varying degrees. While they provide a robust starting point for national governments and business support organizations to improve the overall fashion sector sustainability, further research is required to customize policy and business solutions for each country.

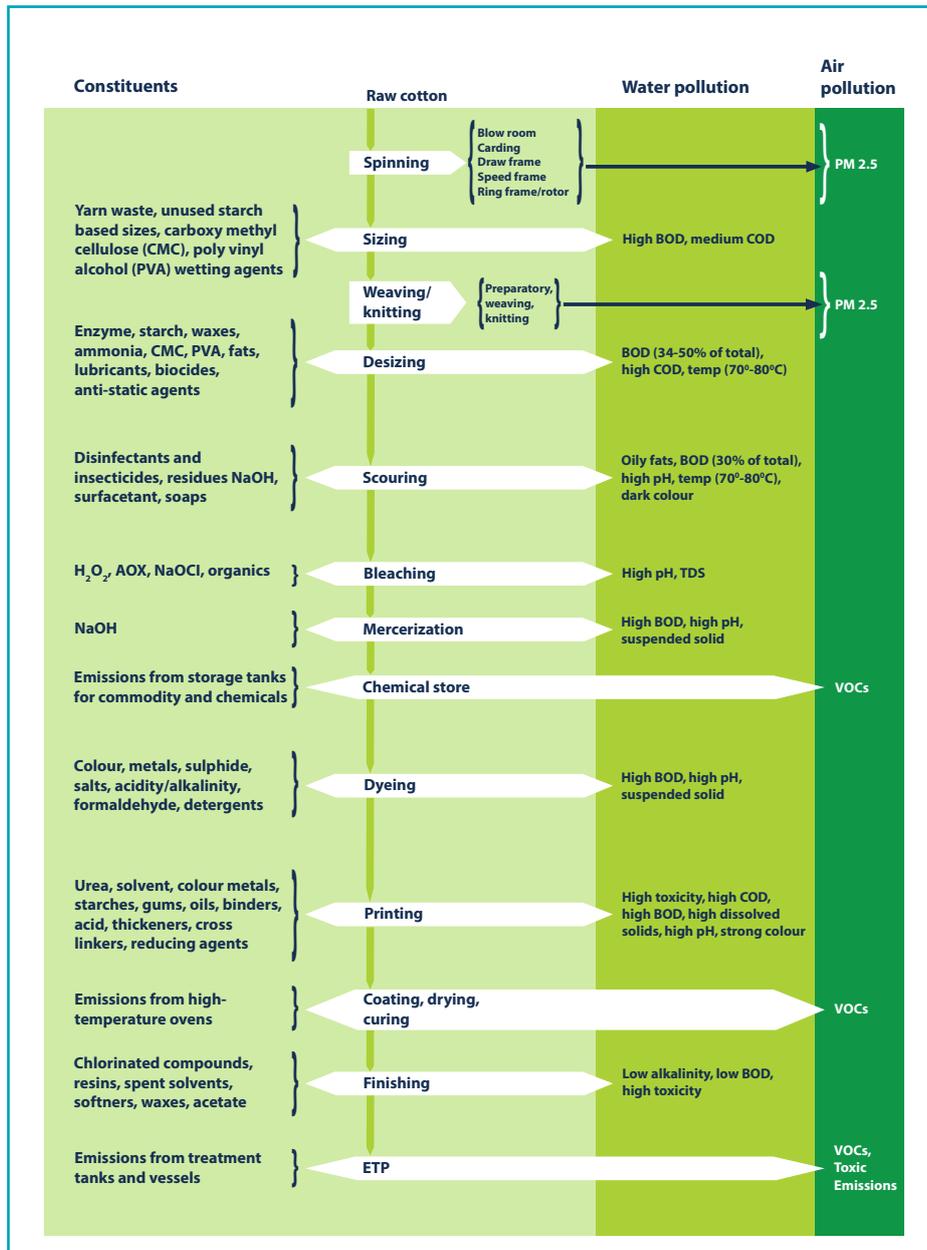
CHAPTER 1. SUSTAINABILITY AND COMPETITIVENESS: WHERE THE LINK LIES

Environmental impact of the textile and leather sectors

The textile and leather sectors are among the largest contributors to environmental pollution. They are also resource intensive – having a large ecological footprint along the value chain and at each step of the product life cycle. The Apparel Impact Institute (Aii)¹ notes that, globally, water used in textile production adds up to nearly 25 trillion gallons. As per the World Resources Institute, 5.9 trillion litres of water are used each year for fabric dyeing alone. Approximately 20% of industrial water pollution in the world comes from treatment and dyeing of textiles, and approximately 8,000 synthetic chemicals are used to turn raw materials into textile. Furthermore, according to a study by the Ellen MacArthur Foundation, textile production greenhouse gas emissions exceed combined emissions of international aviation and maritime shipping. Resource-efficient production technologies and an emphasis on achieving circularity (reducing waste and encouraging reuse of waste as inputs) can potentially save up to 30% of resources used in the textile industry while also minimizing the waste generated. Figure 1 illustrates the major constituents of pollution in the textile and apparel sector.

1.– See <https://apparelimpact.org/program-areas/#water>.

Figure 1: Pollution in the textile industry



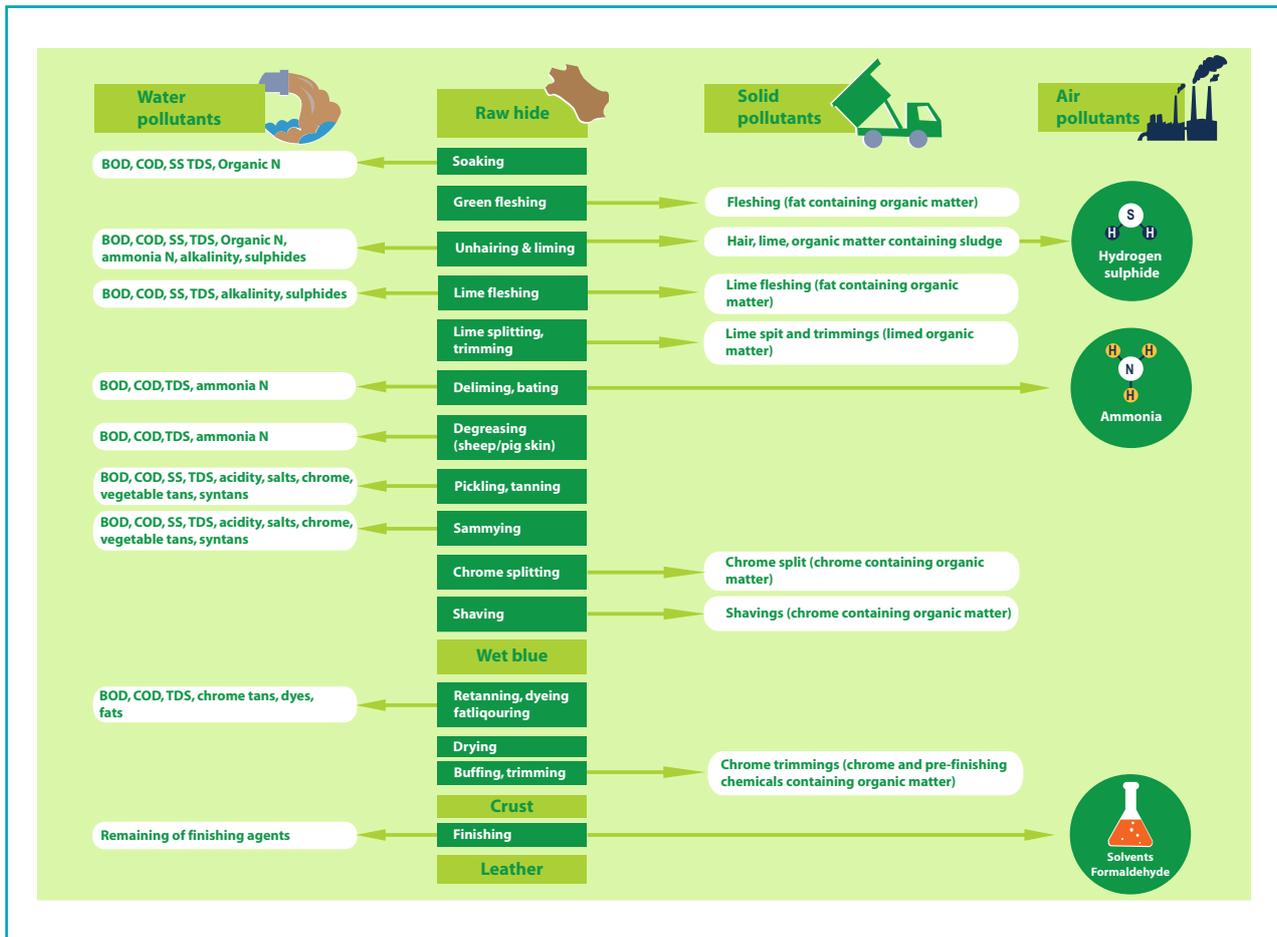
Source: Authors' illustration.

Likewise for leather, the availability of freshwater and wastewater treatment systems remains a challenge for many countries. Wet processing in tanneries is a significant source of solid waste, industrial wastewater and air pollution. In general, processing 1 ton of hides requires approximately 60,000 litres of water,² of which 30,000–50,000 litres is discarded as industrial wastewater,³ and it produces 150kg of sludge as solid waste. Tannery effluents constitute a high amount of dissolved and suspended organic and inorganic solids that, if not treated adequately, substantially contaminate water bodies. Chrome tanning is the most commonly used approach in commercial leather production, which uses a large quantity of basic chromium, a significant pollutant in wastewater. Figure 2 illustrates how tanneries pollute the environment.

2.– Fela, Wieczorek-Ciurowa, Konopka, & Woźny (2011).

3.– INTEGRATION International Management Consultants GmbH (1998).

Figure 2: Pollution from tanneries and leather processing



Source: Authors' illustration.

The need for sustainability

The need for sustainability is both an economic and an environmental imperative, and governments have a responsibility to reconcile the two. With the rise of environmental consciousness, no brand would want to associate itself with environmentally irresponsible suppliers in countries with little regard for sustainability. Therefore, the question of environmental compliance is very much a question of competitiveness. In other words, sustainability concerns are intrinsic to competitiveness—international buyers in the textile and apparel, and leather and footwear industry have become increasingly strict on environmental compliance requirements from their suppliers. Most of them demand adherence to international standards like those of the ZDHC as a minimum requirement to be considered for business. In absence of compliance with these standards, East African manufacturers would not be competitive or be able to benefit from the shift in the global sourcing patterns by attracting international buyers.

At the same time, consumers, especially of a younger demographic, are making conscious choices to gravitate towards environmentally sustainable businesses and are demanding traceability of the final products. In July 2017, the Global Textile Sustainability Consumer Research commissioned by OEKO-TEX, which surveyed 11,000 purchase

decision makers across 10 countries,⁴ found that 70% of the respondents are committed to living in a sustainable, environment-friendly way, while approximately 60% want to know if their clothing or home textile items have been sustainably produced.⁵

Inability to take appropriate, adequate and durable action against pollution by these industries could undermine the attainment of several Sustainable Development Goals (SDGs) in East African countries. These include SDG 13 (climate action), SDG 14 (life on land) and SDG 15 (life under water).

The focus of the report

While sustainability in the leather and textile industries is manifested through a variety of dimensions (social, economic, environmental, political, etc.), this report focuses on environmental sustainability. International environmental standards demanded by buyers in global markets mainly constitute guidelines on wastewater treatment, chemical management, circularity, and resource and energy efficiency. While current common standards do not put substantial emphasis on air emissions, the authors perceive an incipient, but steady trend towards bringing air pollution mitigation under the fold of common industrial standards such as those of the ZDHC.

Developing countries are often faced with a plethora of policy trade-offs. With major concerns on income and employment generation, environmental sustainability and enforcement of environmental laws in the industry are not always prioritized. However, with environmental sustainability progressively becoming a global priority in the textile and leather sectors, economic goals are no longer alien to it. National governments in East African countries should thus try to align local environmental legislation with international standards and be committed to strict enforcement. This will engender an enabling regulatory environment for the leather and textile industries to function in a sustainable fashion.

Finally, as these sectors in most developing countries are characterized by the presence of a large number of micro, small and medium-sized enterprises (MSMEs) with substantial financial and capacity constraints, besides strict enforcement, governments should also empower them to comply better and transform their production processes. Almost all countries in East Africa have included the textile sector in their industrial development plans, and in order for the sector to drive income and export earnings, enabling environmental compliance among its constituent units is crucial.



© ITC

4.– Australia, the Federative Republic of Brazil, Canada, the People's Republic of China, the Federal Republic of Germany, India, Japan, the Kingdom of Spain, the Swiss Confederation, and the United States of America.

5.– See https://www.oeko-tex.com/fileadmin/user_upload/ELO-Downloads/Factsheet_The_Key_to_Confidence_EN.pdf.

CHAPTER 2.

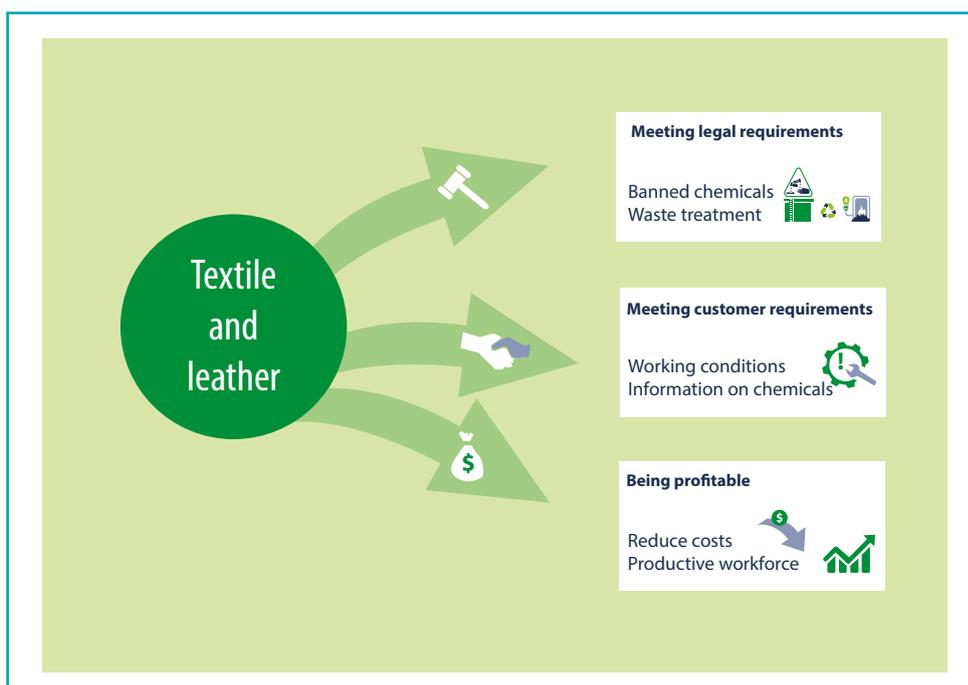
CHEMICAL AND WASTE MANAGEMENT IN LEATHER AND TEXTILE INDUSTRIES

What is chemical management?

Chemical management in the textile and leather industries entails a set of measures and elements to track and control chemicals, identify and assess chemical hazards, manage the risks associated with the use of these chemicals, and planning and preparing for any emergencies involving said chemicals. As Figure 3 illustrates, a sound chemical management system in the textile and leather sectors ensures the following:

- Compliance with legal and regulatory requirements;
- Compliance with requirements put in place by international buyers (clients);
- A profitable and productive work environment.

Figure 3: The need for chemical management in textile mills and tanneries



Source: Authors' illustration.

What is waste management?

Waste can be defined as any material or substance that is discarded from a facility and can potentially pollute and contaminate the environment and surrounding communities. It can also include expired raw materials, materials generated from production processes with no further use on-site, expired finished products, by-products and redundant equipment, etc.

Waste management encompasses all the actions required to collect, treat and dispose of solid, liquid or gaseous materials that have served their purpose in the production process and are no longer useful. A prudent chemical management system, regardless of the industry, should have the three broad elements of waste management shown in Figure 4.

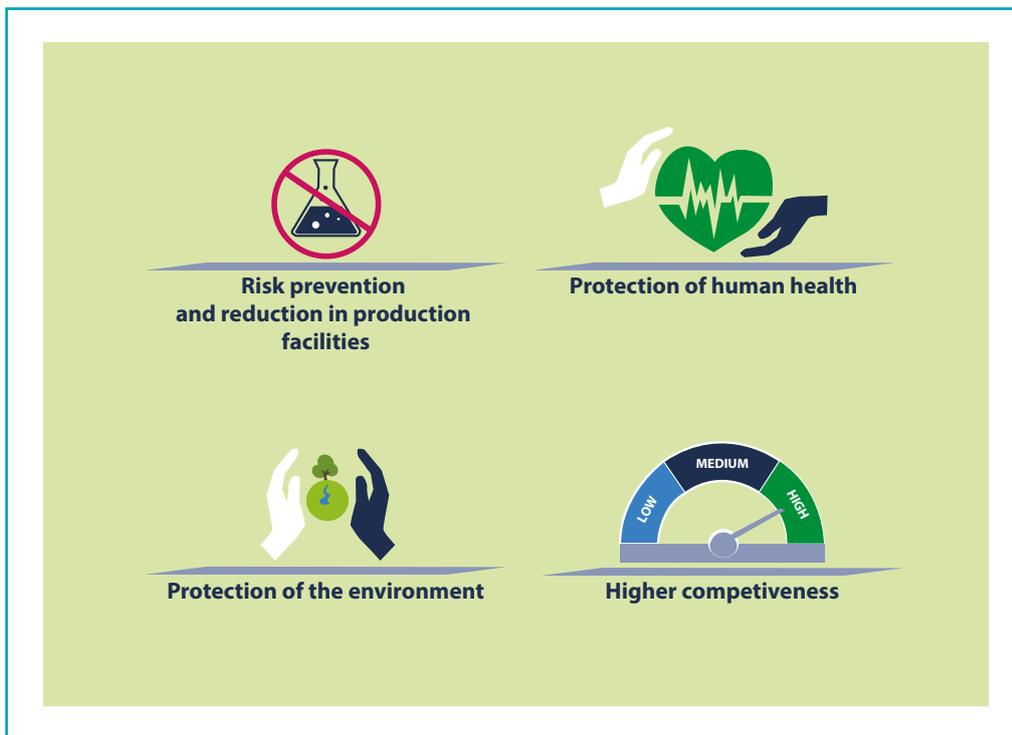
Figure 4: Elements of waste management



Source: Authors' illustration.

As Figure 5 shows, judicious waste management serves the following purposes:

- Risk prevention and reduction in production facilities during transport and treatment of hazardous waste;
- Protection of human health (workers and population) and the environment (natural resources);
- Enhanced competitiveness through better-organized and better-equipped industries and economic regions.

Figure 5: Purposes of waste management

Source: Authors' illustration.

Chemical and waste management processes

Integrated frameworks in the textile and leather industries, such as the ZDHC Chemical Management System Framework,⁶ provide a unified basis from which to operate. In general, chemical and waste management can be incorporated into a wider management system with the goal of attaining sustainability, such as a comprehensive environmental management system. The ZDHC CMS Framework can be adopted by brands, suppliers, facilities, and other supply chain partners. The framework is a base to ensure a sound chemical management system that supports worker safety and the reduction of environmental impact within the community and the broader environment.

Chemical and waste management in the textile and leather industries for enhanced compliance with sustainability requirements can be segregated into the following three sections based on the production process.

INPUT MANAGEMENT

Measures for enhancing efforts towards sustainability should begin at the outset of the production process, with better management of inputs.

6.– See [https://uploads-ssl.webflow.com/5c4065f2d6b53e08a1b03de7/5efdf1ba4c835ede88199ddf_ZDHC CMS Framework_MAY2020.pdf](https://uploads-ssl.webflow.com/5c4065f2d6b53e08a1b03de7/5efdf1ba4c835ede88199ddf_ZDHC%20CMS%20Framework_MAY2020.pdf).

Chemical procurement policy: Choosing the right supplier

Manufacturing units in textile and leather sector companies must have a proper guideline/policy for selecting chemical suppliers and purchasing chemicals from them. Such a policy should have the following salient elements:

- Provision of up-to-date Safety Data Sheets and technical data sheets by the supplier; e.g. as per the Globally Harmonized System (GHS) of classification and labelling of chemicals;
- High-quality labelling on chemical containers (e.g. as per GHS);
- Provision of Manufacturing Restricted Substance List (MRSL) and Restricted Substances List (RSL) chemical declarations;
- Availability of a positive list of chemicals that have been assessed for safety;
- Commitment to worldwide chemical safety and responsibility initiatives such as the Responsible Care Global Charter.⁷

Safety Data Sheets

A Safety Data Sheet (SDS) is a guidance document for chemical safety management and technical information for chemical standard operating procedures.⁸ Chemical manufacturers, distributors or importers are responsible for providing the SDSs of chemicals. It is intended to provide workers and emergency personnel with instructions for safe handling of chemicals during the transport, storage and production processes.

Common elements of SDS include information on:

- Chemical properties;
- Toxicity/hazards;
- Environmental impact;
- Information for safe handling and transportation;
- Leakage and emergency response;
- Relevant rules and regulations related to the use of the chemical.

The SDS needs to be prepared in the local/national language of the production site and be provided for each chemical substance used in the production process. It needs to be filed at the production site and be available there for each chemical input to provide information about safe handling of the chemical input. Finally, it should be prepared in accordance with a commonly accepted norm as follows:

- ANSI Z400.1-2004 – used in the USA;
- ISO 11014-1 – few countries follow this system;
- 1907/2006 EC (REACH) – most countries are now revising their SDSs according to this system;
- 2001/54/EC 2001/58/EEC – used in European Union countries since 2001;
- GHS – every country has a specific target date to implement this system.

7.– See <https://responsiblecare.americanchemistry.com/Guiding-Principles/>.

8.– Standard operating procedures are concise, step-by-step processes prepared by an institution to assist workers in carrying out routine operations in a particular industry.



© ITC

Chemical Inventory List (CIL)

A CIL is a list of chemicals that includes **all chemicals** that are present in the facility and used for different operations such as production processes, to support production processes,⁹ waste treatment, and research and development (R&D).

Maintaining a CIL is the first step in achieving traceability of inputs used throughout the production process. While maintaining a CIL is a mandatory requirement by various international standards and regulations as well as buyers, it also holds several benefits for the production facility:

- A CIL creates a structured base of information for more efficient storage, chemical, environment, health and safety management;
- It systematically identifies all chemicals stored and in use;
- It can help track shelf life and expiry of stored substances;
- It helps in retroactively investigating chemical properties and establishing traceability of inputs.

PROCESS MANAGEMENT

Once the inputs have been procured and catalogued based on the requirements above, the next logical step in sustainable management of production processes is to ensure a high standard of storage, handling and labelling of chemical inputs.

9.– For example, chemicals for machine cleaning during production, solvents to remove paints, gums and adhesives, chemicals used to clean screens, spot removers, chemicals used in boilers, chillers and janitorial chemicals, etc.

Chemical labelling

Chemical labelling is an integral element in communicating the level of hazard associated with the chemical and it must follow basic requirements according to standards such as the GHS. Figure 6 illustrates the key components of a GHS-compliant label.

Figure 6: Basic components of a GHS-compliant label



Source: Sample label courtesy of Weber Packaging Solutions.

Storage and handling of chemicals

Storing and handling of hazardous chemicals as part of the production process must follow pertinent SDS and general storage best practices. These include ensuring good ventilation, a flat and impermeable floor surface, adequate lighting, appropriate presence of extinguishers in the storage space, and appropriate shelves, cabinets and storage containers as required.

In addition, a regular clean-out is required to dispose of expired chemicals in a timely manner and make an inventory of chemicals no longer required. Chemical spills should be addressed immediately.

The following are a few supplementary requirements to follow in order to establish a secure process management, especially of particularly hazardous material.¹⁰

10.– The most common hazard classes include flammables/combustibles, corrosive acids, corrosive bases, toxics, highly toxics, oxidizers, compressed gases, cryogenics, pyrophorics, water reactive and explosives.

- a. Input materials used in the production process should always be segregated and stored according to their chemical family or hazard classification.
- b. Chemicals should not be stored alphabetically unless they are compatible; groups of compatible chemicals should be stored together.
- c. Oxidizers (hydrogen peroxide, nitric acid and perchloric acid, etc.) need to be stored separately from organic chemicals (fuels).
- d. Particularly dangerous chemicals should be isolated in storage (e.g. hydrofluoric acid and pyrophoric materials, etc.).

OUTPUT MANAGEMENT

This section forms the bulk of the efforts towards sustainable production practices and includes all types of liquid, solid and gaseous waste management. As illustrated in the previous chapter (Figure 1), the major routes of pollution in the textile sector are through:

- a. Water (effluents containing suspended solids, toxic material, dyestuffs and pollutants with high biochemical oxygen demand (BOD) and chemical oxygen demand (COD) content, which reduce dissolved oxygen in water bodies, challenging aquatic life);
- b. Air emissions (toxic gases, volatile organic compounds and other harmful particulate matter, detrimental to human, plant and animal life).

Currently, international standards on waste management are mainly focused on wastewater management, but there is a marked trend towards incorporating air pollution standards across the industry.

In the leather sector, pollution occurs across all three domains – wastewater, air emissions and solid waste. As illustrated in the previous chapter (Figure 2), solid waste includes flesh trimmings, hair, lime, fat-containing organic matter, chrome-containing organic matter, and sludge. The major constituents of air pollution from leather processing are ammonia, hydrogen sulphide and odour. Finally, wastewater from leather processing, which is a substantial environmental threat, contains suspended solids, compounds with high biochemical oxygen demand and chemical oxygen demand content that restrict the availability of dissolved oxygen in water bodies, dissolved harmful salts, dyes, chrome salts and compounds that are highly acidic or alkaline. Annex I discusses the pollutants from leather processing in further detail.

Compared to sustainable input and process management, output management requires a longer gestation period to be established, owing to the capital infrastructure investments that are often required to sustainably treat waste. This is one of the chief reasons that both international and national efforts at «cleaning up» the leather and textile value chains have emphasized investments in better output management – both in technical capacity and in physical infrastructure. The stakeholder engagement exercises carried out by SITA among East African policymakers and manufacturers and international buyers and experts also brought out the challenges and expectations in achieving sustainable output management more than input and process management. This does not diminish the importance of the latter two in ensuring overall environmental sustainability and compliance in these two sectors; rather, it points towards the lack of general awareness on input and process management standards.



CHAPTER 3. WITH BETTER ENFORCEMENT, BUYERS CAN DRIVE THE CHANGE

Insights from interviews with international buyers

SITA conducted in-depth interviews with major international buyers to understand their environmental sustainability requirements and discuss challenges in the current regulatory framework in East Africa and elsewhere. In recent years, international buyers in the textile and footwear industry have become increasingly committed to ensuring sustainability along the entire value chain. Many of them have clear requirements on solid and liquid waste, and a few also have requirements on air emissions, resource efficiency and circularity. Even though suppliers can choose not to comply, compliance is in the interest of their business, as most international buyers demand strict conformance to common guidelines.

Until a few years ago, buyers acting as singular entities often found it difficult to demand compliance with international sustainability standards, specifically on wastewater and chemical management, from their suppliers. However, with the emergence of coalitions of buyers, such as the Sustainable Apparel Coalition (SAC), and unified guidelines managed by a common entity such as the ZDHC, buyers have greater bargaining power owing to common requirements and standards, which they can leverage to ensure compliance from suppliers. In other words, when buyers across the board demand similar environmental standards, suppliers have no choice but to comply with them. In the absence of local government regulation, brands have the potential to drive the change in sustainable production in the textile and leather sectors by holding their supply chains to strict standards and, in many developing countries, buyers have indeed driven significant positive change.

Interviews with major buyers outlined the following existing challenges that threaten better compliance with environmental standards along their value chains.

LACK OF ADEQUATE LOCAL LEGISLATION

International buyers are of the view that local legislation in many countries is not commensurate with what is required by international standards. For an international brand, an added layer of complexity is when different sourcing countries have disparate regulations on wastewater and chemical management. This necessitates common benchmarking requirements for all suppliers irrespective of geography, rendering the ZDHC a huge value addition in streamlining the industry requirements. Moreover, even when developing countries have stringent sustainability regulations with benchmarks similar to international standards, enforcement is often inadequate, making the local standards ineffective.

LACK OF TECHNICAL CAPACITY

Textile and leather industries in many developing countries do not always have a technically sound workforce ready to implement strict international sustainability standards from one day to the next. Retention of trained experts in waste and chemical management is another significant challenge – in some cases, despite the presence of training programmes for factory workers, trained staff often leave for better opportunities once they receive the training. There is also a lack of effective learning programmes to enable the creation of a local pool of sustainability experts in the industry. However, with the rapidly globalizing nature of the textile and leather supply chains, lack of capacity in developing countries is expected to get less prohibitive as a challenge in the near future.

INSUFFICIENT POLICY COMMITMENT

Developing country governments face veritable trade-offs in their endeavour to raise incomes and generate employment. Most developing countries compete on attracting FDI by offering benefits to investors, without paying adequate heed to sustainability considerations. Presently, the discourse on environmental sustainability is not fully integrated into investment promotion policies. This needs to change, as compliance with international environmental standards can potentially become one of the most significant deterrents to competitiveness in the textile and leather sectors. As more and more buyers are demanding strict compliance, a lack of adequate local policies to integrate and boost sustainability risks exclusion from the global supply chains in the leather and textile sectors.

TECHNOLOGY OBSOLESCENCE

Outdated technology, while already detrimental to productivity, workplace safety, quality compliance and overall competitiveness, can have a direct bearing on non-compliance with environmental standards. In the race to attract FDI, developing countries should not disregard the need for up-to-date technology; they should disallow investors from accompanying FDI with second-rate technology.



(cc) Make It Kenya Photo / Stuart Price.

LACK OF RELIABLE INFORMATION

International buyers agree that, for most suppliers in their supply chains in developing countries, a big bottleneck is the lack of comprehensive information on what standards are required, and where they fall short. In some cases, even if the suppliers have the required certification, gaps might exist in effectively communicating with buyers on the attainment of said certification. Lack of sensitization to the need for compliance also necessitates fundamentally influencing supplier mindsets, making a case for firmly integrating sustainability in their production functions. This problem also exists within the same country – pockets of innovation and best practices might exist in a country, but they are not scaled up and propagated elsewhere. Global initiatives are trying to bridge this information gap, but a lot more needs to be done, especially in Africa.

Depending on specific country contexts, there might be additional constraints that buyers face; however, the above-mentioned ones are commonly experienced by most buyers when sourcing from developing countries, including Africa. Buyer interviews also provided possible solutions to these constraints; these have been discussed in detail in Chapter 7.



CHAPTER 4. MANUFACTURERS NEED MORE SUPPORT TO GO GREEN

Insights from interviews with manufacturers in East Africa

SITA conducted interviews with several manufacturers and manufacturers' associations in the textile and leather sectors, representing East African countries – Ethiopia, Kenya, Rwanda, the United Republic of Tanzania, and Uganda. Interestingly, the key bottlenecks identified by international buyers were also recognized by suppliers as major hindrances.

For African businesses to firmly situate themselves in the global supply chains of brands in the textile and leather sectors, the presence of necessary knowledge and skills to be compliant with the relevant standards is of paramount significance. Manufacturers need to be able to evaluate their production practices and identify areas that require better conformance to global standards. Especially for MSMEs, there needs to be a unified, industry-wide strategy to improve compliance, and it requires active support from policymakers. Ensuring adequate financing opportunities, bridging asymmetric information gaps and building requisite technical capacities are required to render the sectors sustainable and, hence, competitive in East Africa. This means that governments have a vested interest in supporting the industries in their respective countries to achieve higher compliance.

The following constraints were revealed in the course of SITA's discussions with the manufacturers in East Africa. Most of them are common across sectors and countries.

ENFORCEMENT IS OFTEN COUNTERPRODUCTIVE

The objective of environmental legislation and its enforcement is to penalize manufacturing units that flout regulations, but also to work with businesses to capacitate them to meet the regulatory standards. As discussions with manufacturers demonstrated, the enforcement is often undertaken by officials without sufficient knowledge of the larger industrial context, resulting in a singular focus on penalizing non-compliance. This lack of understanding of the core constraints facing manufacturers precludes cooperation between regulatory authorities and businesses in improving overall compliance of the industry through learning, as the focus is primarily on punitive rather than corrective action.

INADEQUATE ACCESS TO INFORMATION

As seen in the previous chapter, being equipped to comply with global sustainability standards demanded by global brands in the leather and textile industries is increasingly becoming one of the most crucial entry requirements in the global supply chains. However, in East African countries, manufacturers in these industries, especially MSMEs, are not fully aware of the required standards, which puts them at the risk of being excluded from the supply chains. The information on standards and certification is not comprehensive, is obsolete or is completely absent. As agreed by all stakeholders in East Africa, this information asymmetry between buyers and suppliers is probably the biggest handicap facing African businesses in the realm of sustainability.

LACK OF CAPACITY

Manufacturers across the board concur on the dearth of technical capacity in the industry to adopt sustainable production practices. They have to bring in international experts at high cost or hire local staff with insufficient training. There is also a lack of specialized training programmes and curriculum commensurate with the sustainability requirements of the textile and leather industries. The talent pool is also severely limited, as not many in these countries are willing to receive the training required to enter the textile and leather sectors. Even with investments in technology to improve compliance, in the absence of human resources with the required technical capacities to lead sustainability efforts, compliance will be difficult to achieve.

LACK OF FINANCING AND LONG-TERM PLANNING

Manufacturers' associations across East Africa agree that, while MSMEs' lack of access to financing to undertake sustainability efforts is a veritable bottleneck, many of them do not see merit in investing in best practices for environmental sustainability. This is due to the fact that many of the required facilities to improve compliance demand substantial capital investments. In addition, the production functions of manufacturers in many of these cases are geared to the short-term economic returns, and they do not perceive the value of being environmentally compliant. Together with the lack of financing opportunities, this dampens the incentive to invest in compliance. In other words, many manufacturers do not consider environmental compliance to be a key dimension to be competitive in the global industry. Clearly, this is a structural handicap, and its rectification requires active policy intervention.



(cc) Make It Kenya Photo / Stuart Price.

TECHNOLOGY OBSOLESCENCE

Technology obsolescence as a constraint often sits at the crossroads of the challenges discussed above. Manufacturers agree on the role obsolete technologies play in hindering compliance, but often they do not have the funds to invest in technology upgradation or they lack the technical capacity to operate up-to-date technology. A 2019 SITA survey of 110 textile manufacturing units in East Africa revealed just that – access to finance and lack of technical capacity are the biggest deterrents to technology upgradation, followed by high power costs.¹¹ In some cases, when manufacturers invest in up-to-date technology to improve compliance and productivity, the lack of spare parts in the local market, coupled with inadequate maintenance, acts as a roadblock to a seamless integration of the machinery into the production facilities.

11.– See https://bsm-india-itme.s3.ap-south-1.amazonaws.com/Technology_Upgradation_v3_web-ITC.pdf.



CHAPTER 5. NATIONAL STANDARDS IN EAST AFRICA: CURRENT CONSTRAINTS

Insights from interviews with policymakers in East Africa

SITA conducted in-depth interviews with policymakers responsible for environmental policymaking across Ethiopia, Kenya, Rwanda, the United Republic of Tanzania, and Uganda. These interviews revealed the priorities of environmental policymaking in East Africa, focusing on tackling industrial waste, but also shed light on the constraints in formulating binding environmental regulations and enforcing them effectively. In general, the degree of awareness among policymakers on the exact areas that require further support is high. Across all five countries, policymakers attribute the tenuous progress towards more sustainable production facilities to the lack of information, appropriate infrastructure, and capacity constraints, which partially mirror the insights from international buyers and East African manufacturers in the leather and textile sectors.

It is imperative that national policies on sustainability in East African countries nurture and support the manufacturing units in the leather and textile sectors. Many of these units are MSMEs and, without the required support, they will not be competitive or able to take the necessary steps required to comply with the environmental requirements laid down by international brands. Thus, as a first step, policymakers need to take stock of what the most pressing constraints are, in order to address them effectively. Sustainability concerns should be accorded importance while formulating policies to attract FDI.

The following were the principal bottlenecks towards environmental policymaking, identified in course of the interviews.

LACK OF COMPREHENSIVE INFORMATION ON STANDARDS

Most policymakers realize the need to align national legislation on industrial chemical and waste management with the requirements of the global industry, but fall short of having a comprehensive knowledge of said requirements. Policymakers in East Africa often refer to standards in other countries in the Global South, China, India and the Republic of South Africa, for example, or even standards laid out by international organizations such as the United Nations Industrial Development Organization (UNIDO) or the International Organization for Standardization (ISO). However, policies and standards that stem from doing so are often alien to the local constraints and contexts in East Africa. This lack of an appropriate reference point from which to formulate environmental regulation, keeping in mind the requirements of the buyers as well as the constraints of the manufacturers, is perhaps the biggest void at present.

LACK OF TECHNICAL CAPACITY

In some cases, policymaking authorities on industrial chemical and waste management lack the requisite technical capacity to interpret the requirements of global brands. This is also reflected in enforcement – as discussed previously, when enforcement officials lack the technical knowledge of standards and the context in which the manufacturers operate, the enforcement becomes solely punitive, rather than corrective. Furthermore, in many of these countries, depending on the government's priorities and constraints, environmental policymaking units are often understaffed, rendering both legislation and enforcement a challenge.

INSUFFICIENT MONITORING AND EVALUATION INDICATORS

Several policymakers pointed towards the absence of indicators to gauge compliance with industrial chemical and waste management regulation. Data collection on compliance at various stages of the value chain is also missing, which makes enforcement difficult. There is a general understanding among policymakers that more investment needs to be made to develop commensurate pollution measurement indicators and analyse the resulting data to make effective regulation.

INSUFFICIENT INFRASTRUCTURE AND ACCESS TO FINANCE

Many of the interviewed policymakers attribute the manufacturers' inability to comply with environmental regulation to the lack of access to finance and inadequate infrastructure. The lack of industrial zones to homogenize solid waste and effluents, as well as the absence of common effluent treatment plants (CETPs) to treat effluents efficiently renders good legislation ineffective. These infrastructure gaps require substantial financing to fill, which is insufficient in most of the countries studied. Compliance entails infrastructure upgradation in production facilities, which also requires financing. Since manufacturing units, especially MSMEs, cannot easily access the required funds, it dampens their motivation and ability to undertake sustainable production practices. As we saw in the previous chapter, lack of access to financing is one of the key bottlenecks faced by manufacturers, and policymakers seem to agree.

CHAPTER 6. INTERNATIONAL INITIATIVES ON SUSTAINABILITY IN THE LEATHER AND TEXTILE SECTORS

Major international initiatives on fashion sector sustainability

This chapter discusses a few of the major international initiatives targeted at ensuring sustainability in the leather and textile value chains. With environmental compliance assuming paramount importance, appropriate certification attesting said compliance is a good investment. It helps in advertising a facility's sustainable production practices, helps brands choose cleaner supply chain partners and provides a uniform benchmark to guide efforts towards greening the fashion value chain.

Several of the initiatives discussed here focus on capacity development for mills and tanneries and issue certificates at the end of a training programme, validating the attainment of special skills pertaining to cleaner technologies and practices, usually through an assessment and audit.



(CC BY-NC-ND 2.0) World Bank Photo Collection

Zero Discharge of Hazardous Chemicals (ZDHC)¹²

The Zero Discharge of Hazardous Chemicals is one of the most authoritative frameworks towards sustainability in the leather and textile sectors. It was launched in 2011 in the wake of a rising scrutiny on the fashion industry's polluting nature, and an investigation into wastewater discharge, by Greenpeace International.

The ZDHC Foundation was established in 2015 in Amsterdam with a vision of collaborative efforts from brands towards mainstreaming sustainable chemistry, sustainable innovation in the value chain and a firm commitment to best practices in the fashion industry to protect consumers, workers and the environment. The foundation oversees the Roadmap to Zero programme, a comprehensive set of guidelines towards better chemical and wastewater management in mills and tanneries, through input, output and process management. The ZDHC also offers a holistic approach to greening the fashion value chain, offering not only science-based standards and targets, but also implementation support and capacity development. Its three-step approach (foundational, progressive and aspirational parameters) covers production facilities across the spectrum of environmental compliance and makes conformance to standards feasible for the majority of mills and tanneries. The Roadmap to Zero programme has 160 contributors across the global fashion sector, representing a vast multi-stakeholder initiative.

The ZDHC aims to capitalize on effective collaboration between global fashion brands, suppliers and the chemical industry. The key elements of its approach are:

- a. Establishing industry endorsed and industry aligned guidelines and tools for sustainable chemical management;
- b. Facilitating actual implementation of these standards in production facilities;
- c. Embracing a holistic stakeholder engagement process to empower producers at all points in the supply chain to manufacture safer products with minimal environmental impact.

Sustainable Apparel Coalition (SAC)¹³

The Sustainable Apparel Coalition is a non-profit alliance with 250 members across the globe, representing an international multi-stakeholder initiative to institutionalize sustainability in the fashion industry. Its members constitute global textile, apparel and footwear brands, industry and trade associations, suppliers, non-governmental organizations (NGOs) and educational institutions, among others. It is one of the pioneering industry collaboratives in the sector working towards environmental sustainability and owes its origins to a partnership between Patagonia and Walmart, leading efforts in the industry to assess the environmental impact of their products.

12.– See Roadmap to Change. Available from <https://www.roadmaptozero.com/>.

Through its Higg Index, SAC fills the assessment gap in the industry – sustainability efforts are rendered ineffective in the face of negligible knowledge on quantifiable environmental impact. The index is a set of sustainability tools covering each step in the fashion supply chain to assess environmental and social impact of the production process, identify areas for improvement and leverage industry benchmarking to drive overall improvement in value chain sustainability.

The Higg suite has several modules serving a wide cross section of the value chain. For example, the Higg Facility Environmental Module (Higg FEM) is a self-assessment tool (not an audit) that standardizes how production facilities gauge and evaluate their environmental performance.

Apparel Impact Institute (Aii)¹⁴

The Apparel Impact Institute was established in 2017 by the Sustainable Apparel Coalition, the Sustainable Trade Initiative, and Target Corporation to strategically lead sustainability improvements in the fashion industry. The Aii manages partnerships with industry and other professional services to scale up initiatives with demonstrated impact, in the process enhancing the efficacy of apparel supply chain solutions that tackle the most urgent sustainability needs. At its heart, the Aii is a solutions-oriented entity, with an objective to popularize the uptake of sustainability practices that work. By integrating the existing Clean by Design (CbD) programme best on promoting best practices, the Aii works towards developing simple, singular frameworks on reducing ecological footprints of textile mills that can be applied universally. On average, affiliate mills that have undergone the programme have seen 10% CO₂ reductions, 20% water savings and \$440,000 savings after 14 months – the monetary savings can potentially be reinvested towards further sustainable practices.

The Aii's programmes are impact driven, with a focus on measurable impact and data transparency, and target water, energy and chemical management as principal programme areas. It also places a premium on sustainable capacity development among the partner mills – impact that can outlast the training period and bring about durable impact. Aii programmes usually follow a financial approach wherein the mill undergoing the training covers one-third of the training fee and the rest is shared by the brand that the mill supplies to and the Aii (through its network of donors).

Partnership for Cleaner Textile (PaCT)¹⁵

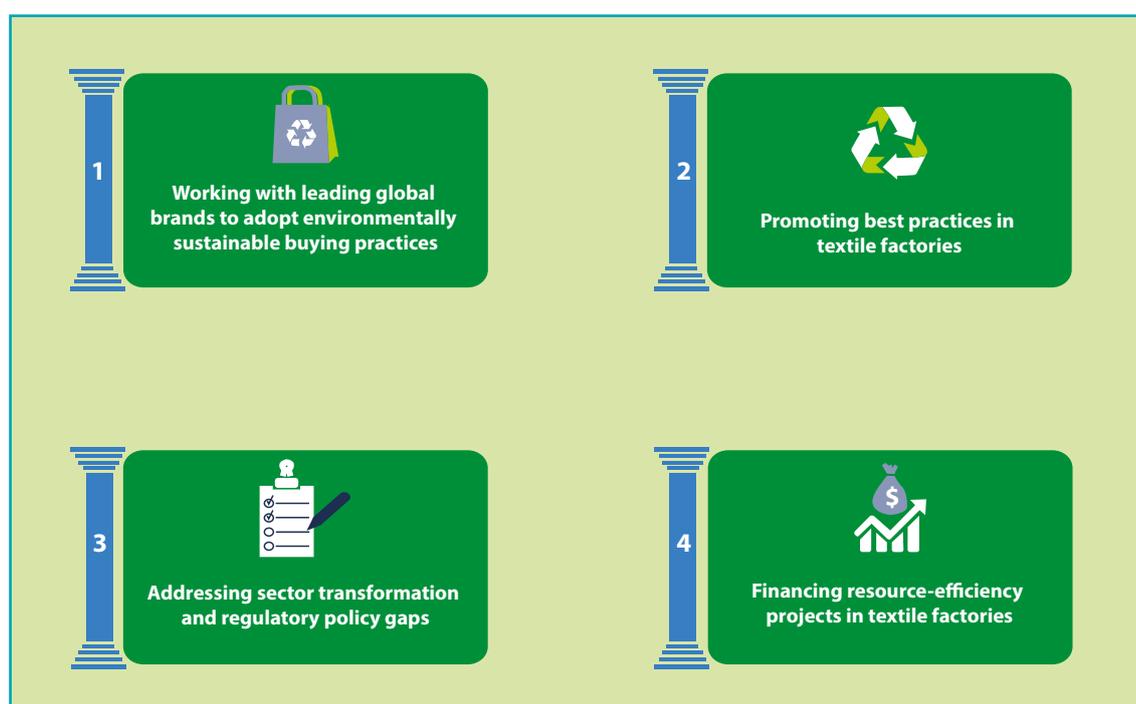
The Partnership for Cleaner Textile is an example of global initiatives that leverage partnerships among the industry, governments and international stakeholders to address key constraints in implementing sustainable production, such as access to finance. PaCT focuses on ensuring long-term competitiveness and environmental sustainability of the textile wet processing sector. At the heart of its approach lie the establishment and

14.– See <https://apparelimpact.org/about/>.

adoption of best practices for resource efficiency and cost optimization, by reducing water, energy and chemical use. While contributing to a leaner production function that facilitates higher profitability, the best practices also contribute to efforts towards greening the textile value chain.

PaCT rests on four pillars that tackle crucial issues thwarting resource efficiency in the textile supply chain – partnering with global brands to drive market adoption of sustainable practices, promoting best practices in textile mills, addressing gaps in large-scale sector transformation and regulatory hurdles, and easing access to finance. Figure 7 illustrates these four pillars.

Figure 7: Pillars of PaCT



Source: Authors' illustration.

PaCT was launched in 2013 by the International Finance Corporation (IFC), with financial support from the Governments of Australia, the Kingdom of Denmark and the Kingdom of the Netherlands. PaCT has seen projects in several countries, including the People's Republic of Bangladesh, India, the United Mexican States, the Islamic Republic of Pakistan, South Africa, the Democratic Socialist Republic of Sri Lanka and the Socialist Republic of Viet Nam. Table 1 lists some of PaCT's key aspects.

Table 1: PaCT key aspects

Production facilities assisted	338
Freshwater consumption reduction achieved	25 million m ³ /year
Wastewater discharge reduction achieved	21.08 million m ³ /year
Energy savings achieved	2.5 million MWh/year
CO2 emission reduction achieved	489,796 tons/year

Source: PaCT website: <https://www.textilepact.net/what-is-pact.html>.

PaCT in Bangladesh is one of the largest advisory programmes under the World Bank Group and it is implemented in collaboration with the international non-governmental organization Solidaridad, the Embassy of the Kingdom of the Netherlands, 13 global apparel brands and two technology suppliers, textile factories, and the Bangladesh Garment Manufacturers and Exporters Association (BGMEA). Advocacy by PaCT also led to the creation of a \$200 million Green Transformation Fund, which helps the Government of Bangladesh to provide low-cost financing to institute resource-efficiency projects in production facilities.

Sweden Textile Water Initiative (STWI)¹⁶

The Sweden Textile Water Initiative, jointly launched by the Stockholm International Water Institute (SIWI) and the Swedish textile and leather sector, has developed guidelines for sustainable water use in the production and manufacturing processes of leather. The guidelines are applicable to leather production and manufacturing processes from thread and raw hide to the finished product.

Table 2: Selected wastewater criteria of the STWI guidelines

	Level 1: Minimum	Level 2: Improver	Level 3: Achiever
Effluent segregation	–	<ul style="list-style-type: none"> • Effluent-containing sulphide to be oxidized or precipitated before mixing with other effluent. • Effluent containing chromium to be segregated and chromium (III) to be precipitated and recycled. 	Wastewater streams from different process steps (including rainwater) to be separated so that clean stream can be reused with little or no treatment.
Treated wastewater quality	To comply with legal requirements	To be better than legal requirements.	To be better than legal requirements and be compliant with target values of the guidelines that are mostly taken from direct discharge requirements in European Union best available techniques (BAT) conclusions on industrial emissions for the tanning of hides and skins (European Commission, 2013).
Treated wastewater recipient	To be known	Impact on recipient to be evaluated.	Recipient to remain fit for the purpose of downstream water uses (e.g. drinking water, swimming and irrigation).

Source: Information compiled by the Ramboll Group.

16.– See <https://www.siwi.org/what-we-do/business/swedish-textile-water-initiative/>.

Leather Working Group (LWG)¹⁷

The Leather Working Group, founded in 2005, has more than 1,000 members comprising brands, retailers, manufacturers and suppliers across the value chain, and industry associations representing the sector. It is a not-for-profit group that administers the most authoritative environmental certification in the industry. The group's audited tanneries represent close to one-fifth (20%) of the world's production of footwear leather and make up approximately 16% of total global leather volume. Once a tannery is audited successfully, a certificate is issued that entitles the leather manufacturer to membership in the LWG.

The certification is categorized into four levels: gold, silver, bronze and audited. Each rating entails the attainment of minimum scores in the particular level. The audit protocol criteria include waste management and effluent treatment.

The effluent treatment aspects contributing to the scores include:

- Provision of separate site drainage system (for surface run-off, sanitary effluent and process effluent);
- Wastewater treatment plant operations;
- Salt discharge;
- Monitoring of wastewater discharge quality;
- Verification of monitoring of wastewater discharge;
- Wastewater discharge quality.

Alliance for Water Stewardship (AWS)¹⁸

The Alliance for Water Stewardship is an international membership-based collaborative that is composed of businesses, non-governmental organizations (NGOs) and the public sector. It is responsible for the International Water Stewardship Standard or the AWS Standard, which is a universal framework to inform and guide the sustainable use of water and water resources. The AWS Standard promotes, accredits and rewards good water stewardship performance. It provides a globally accepted and applicable water use framework for water users to evaluate the impact of their water use, and a set of directives to work collaboratively in enhancing the sustainable use of water on-site.



(cc0) pixabay, Image by Arek Socha from Pixabay.jpg

17.– See <https://www.leatherworkinggroup.com/who-we-are/about-us>.

18.– See <https://a4ws.org/about/>.

CHAPTER 7. POLICY RECOMMENDATIONS AND BEST PRACTICES

Recommendations

Stakeholder engagement exercises with international buyers, East African suppliers in the fashion value chain, policymakers and international sustainability experts, while contributing towards gauging the bottlenecks to compliance in East Africa, also yielded concise, actionable recommendations. These recommendations are generic to all East African countries and represent international best practices, especially in countries of the Global South, as well as the specific constraints faced by East African stakeholders in the industry. The recommendations have been grouped into four buckets, based on the action they entail – physical infrastructure development, changes in regulatory and enforcement environment, creating local technical capacity and awareness, and nurturing an overall enabling environment to encourage environmental compliance.

RECOMMENDATIONS ON PHYSICAL INFRASTRUCTURE DEVELOPMENT

These recommendations address the infrastructural gaps in East African countries, which contribute to the difficulties in better treatment of solid waste, wastewater and air emissions. As these entail substantial project outlays, and their benefits in terms of a cleaner environment and higher sector competitiveness accrue to both the society and businesses, such infrastructure development projects should ideally be a collaborative endeavour between the government and the industry. Adequate support from the government is required to ensure that the long-term nature of the undertakings does not thwart access to finance.

Build integrated industrial sites and parks

East African governments need to promote clustered industrial activity, wherein production sectors are grouped together in a physically proximate unit. Industrial parks are an effective infrastructural solution wherein the industries that produce similar effluent loads through their manufacturing and processing activities undertake efficient waste management. As the waste generated from each unit is similar to the other's waste, this makes waste treatment more cost-effective. In addition, as shown in the next recommendation, industrial parks engender the possibility to leverage circularity in chemical processes to ensure that waste or non-productive output from one facility can be used as input for another.

In the Global South, including in East African countries, the merits of industrial parks are well known, in exploiting economies of scale, reducing consumption of utilities, facilitating export logistics and reducing the effects of greenhouse gas emissions. However, integrated waste management is one of the most significant advantages of grouping industrial sectors in the same location on the basis of the characteristics of waste generated. For new industrial parks, thus, special emphasis should be placed on only allowing facilities whose effluents meet pre-specified treatability requirements.



(cc0) Image by Hands off my tags! Michael Gaida from Pixabay

Target effluent harmonization and circularity through common effluent treatment plants (CETPs)

As a logical next step to creating industrial parks on the basis of common effluent properties, governments in East Africa should look at creating or incentivizing common effluent treatment plants. This will ensure that the wastewater generated from the industrial parks with similar production processes generates homogeneous effluent and the effluent quality and quantity can be effectively treated.

The below thought piece discusses CETPs in the Indian state of Tamil Nadu and how it allows for significant cost reduction on two fronts. Through economies of scale in waste treatment, the operation costs are much lower for CETPs, although their initial construction outlay is higher than captive treatment plants. At the same time, in integrated industrial sites, CETPs allow for cost savings by leveraging circularity in an effective fashion – clean water and salts, which are by-products in effluent treatment, can be fed back into the industry as inputs, reducing input costs and the dependence on clean water availability.



Thought piece 1: Environmental sustainability of the textile dyeing industry

By **K Ramesh**, Senior Manager (Process Engineering),
Tamil Nadu Water Investment Company Limited.

The textile industry exports a high volume of garments made of cotton/synthetic materials to foreign countries. As such, the industry makes important revenue contributions to the Indian economy. Particularly in the wet processing of fabric, the manufacturing chain uses a high volume of dyes, chemicals, salts and other auxiliaries to manufacture the dyed fabric. It also uses a substantial volume of fresh water in the wet process for chemical preparation and washing of fabrics. Consequently, these industries produce a great amount of wastewater containing unabsorbed dyes, salts and other chemicals that are extremely toxic. Discharging it without the proper treatment can cause serious harm to the environment. Accordingly, this wastewater must be treated before it is discharged into the environment. The primary and secondary stages of treatment can eliminate the organic pollutants, but can't eliminate inorganic contaminants. Thus, the government has created a strict environmental standard to safeguard the environment.

Government regulation on wastewater management

In view of the negative environmental impacts caused by the dyeing industry, the pollution regulatory body, Tamil Nadu Pollution Control Board (TNPCB), has directed all industries in the state of Tamil Nadu to implement effluent treatment plants based on zero liquid discharge (ZLD) to prevent the discharge of partially treated/untreated wastewater into nearby water bodies. As directed by the TNPCB, few dyeing industries in Tirupur have established their own captive ZLD facilities, while the other industries have been connected to the CETPs. ZLD is an engineering approach in which wastewater undergoes various stages of treatment and, at the end of the treatment cycle, valuable resources such as clean water and salts are recovered for reuse in the manufacturing process.

Micro-financial analysis

Since the ZLD system involves many high-end, sophisticated purification technologies to treat the wastewater and produces valuable resources such as pure water and salt (sodium chloride/sodium sulphate) for reuse in the dyeing process, the capital investment for establishing such treatment plants is substantial.

The initial investment for a captive ZLD system is between \$1.8 million and \$2 million per million litres per day (MLD) and between \$2.6 million and \$2.9 million/MLD for a CETP. The recurring cost for maintaining the ZLD-based treatment system in both the cases would be roughly \$3/m³ of effluent. Since a dedicated wastewater transmission pipeline is laid to connect the member units to the common treatment facility, to transport the wastewater, the initial capital investment is considerably higher in this case than in the captive plant. However, the operation, maintenance and monitoring of wastewater treatment units is easier in a common treatment facility. Approximately 60%–70% (approximately \$2/m³ of effluent) of the recurring ZLD system operating cost could be recovered by producing clean water and salt from the wastewater for reuse.

Circular economy approach

All the dyeing industries have implemented state-of-the-art wastewater treatment technologies that comprise biological treatment, reverse osmosis (RO) and thermal evaporation technologies to treat toxic wastewater. At the end of the treatment cycle, the valuable resources such as pure water and sodium sulphate salt are recovered from the wastewater and being recycled back for reuse in the dyeing processes. As a result, these industries produce essential resources (sodium sulphate/sodium chloride and pure water) from the wastewater stream, instead of procuring from the open market.

This sustainable practice is helping the dyeing industry in terms of achieving the regulatory environmental standards, while recovering inputs from the wastewater for reuse in the wet processes. As the textile dyeing operation relies on consistent water supply and quality, its operation is sometimes curtailed due to non-availability of water during the dry season. As a result, the entire dyeing operation has to be paused, entailing huge revenue losses for the industry. To overcome this issue and maintain continuous production by the industry, a ZLD-based wastewater treatment facility can be installed to get uninterrupted water supply for dyeing operations and achieve environmental standards at all times.

Government support

To boost the textile industry's growth and achieve an environmentally sustainable production approach, the Ministry of Textiles (MoT), Government of India has announced the Integrated Processing Development Scheme (IPDS) for textile industries to construct common wastewater treatment facilities to which the MSME-based textile wet processing units can be affiliated as a member unit. Under this scheme, the central government will provide 50% of the project cost as a subsidy with a ceiling of INR 75 crores for ZLD projects, while the state government extends a subsidy at 25% of the project cost. The remaining project cost of 25% (15% and 10% as equity and bank loan respectively) shall be brought by the member dyeing units as an upfront project cost. This scheme facilitates to avail the subsidy only on capital investment of the project and not for any recurring cost of the created facility. However, this scheme is not applicable to establish any captive or individual effluent treatment plant by the dyeing industry on its own.

Some dyeing industries increasingly prefer to create their own treatment plants, owing to some technical issues such as:

- Location of dyeing industry;
- Distance from the central treatment facility;
- Volume of wastewater generated;
- Type of wet processing.

Need for technical expertise to operate ZLD facilities

Stringent training is required periodically for the operators/professionals of the ZLD facility. Although the government is providing the financial support to establish high-end wastewater treatment technologies, a dedicated technical crew should be deployed to maintain such ZLD facilities. Thus, technical-*cum*-operational training should be provided to the operators for which the necessary training institutes are essentially to be established with technical experts



(cc0) pixabay, Image by Mikes-Photography from Pixabay.jpg

Certify testing labs and create a monitoring and database management system for industrial waste

A key block in the infrastructural arsenal to combat environmental degradation by the fashion industry is a well-functioning laboratory to assess the chemical properties of effluents and emissions. In other words, a certified laboratory with the capacity to test chemicals, raw materials, wastewater, hazardous waste and sludge is an important aspect of good chemical management system.

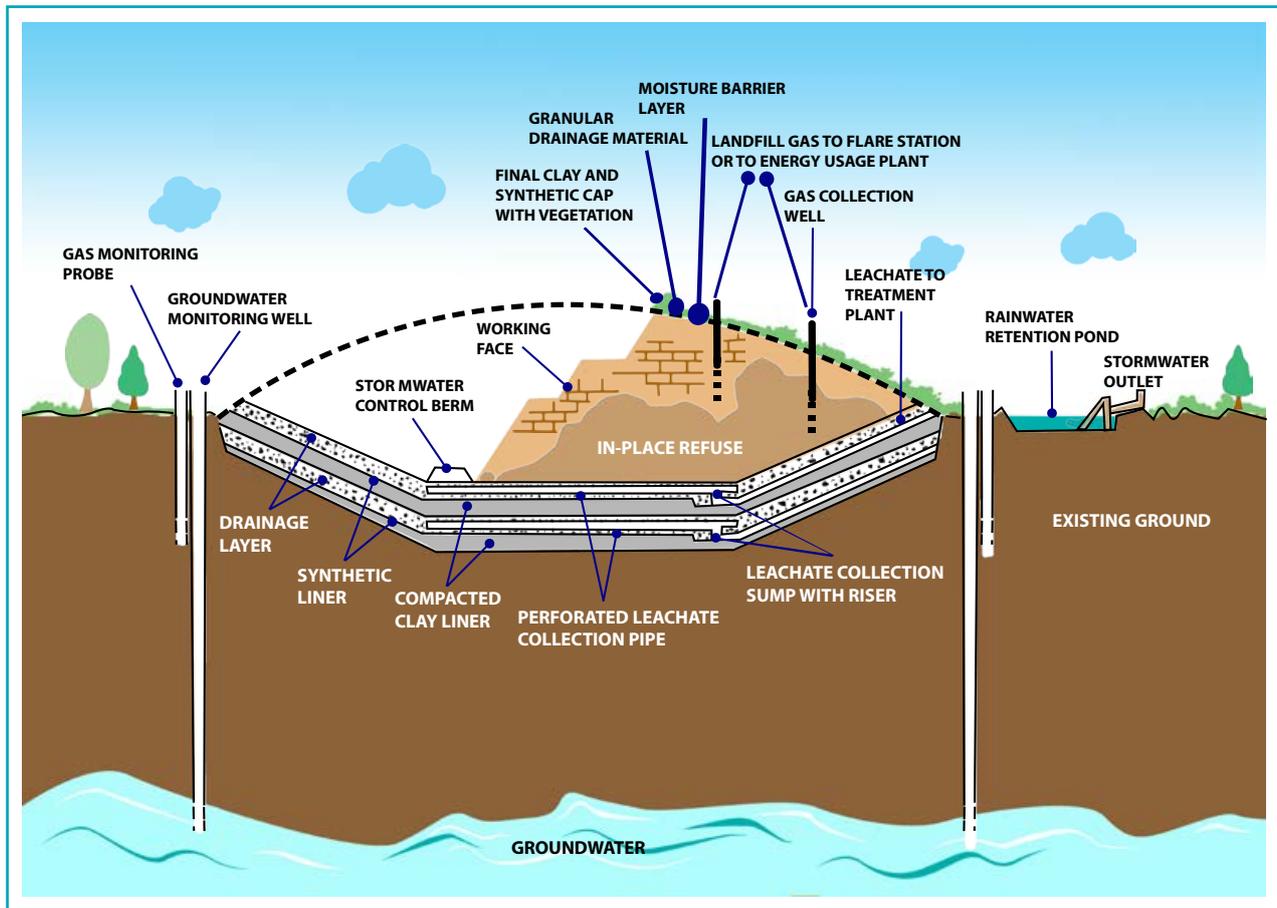
In developing countries, including ones in East Africa, it is often debated whether the laboratories should be public undertakings or privately run. Establishing a government-run verification laboratory is generally not recommended, as it can be burdensome to the public exchequer in terms of maintaining equipment and trained personnel. Instead, governments in East Africa can contract or incentivize certified private sector chemical testing and reference laboratories. The governments can also support private laboratories in procuring requisite international accreditations – this is a worthwhile investment in demonstrating environmental compliance of the local industry to international brands.

Laboratories must meet international best practices and standards for the assessment to be legitimate and have meaningful impact. In particular for the leather and textile sectors, the laboratories should have the capability to test the raw effluent water, discharge water after treatment, sludge for conventional parameters, and hazardous chemical residues, including heavy metals.

Undertake accreditation and approval of waste disposal sites

Governments in East Africa should construct sound landfill and waste disposal sites to minimize the risk of environmental contamination. Environmental bodies should work with civic authorities in approving and certifying disposal sites, which should have controlled incineration, secured perimeters, and sustainably handle all hazardous waste and refractive inorganic and organic waste. Figure 8 illustrates the design of a safe and effective waste disposal site.

Figure 8: Schematic diagram of a landfill site



Source: Irish Environmental Protection Agency guidelines. Available from <https://www.epa.ie/publications/compliance-enforcement/waste/a-guide-to-landfill-site-design.php>

RECOMMENDATIONS FOR A STRONGER REGULATORY ENVIRONMENT

Complementary to a robust physical infrastructure on better waste and chemical management, strong, consistent regulatory structures provided the much-needed guidance and framework to institutionalize sustainable production. In the fashion sector, it is the international buyers who have driven much of the initial sustainability regulation in countries such as Bangladesh, but ideally creating regulation should be a joint effort between the government and the private sector. The government's role is also to respect the local context while legislating on sustainability, while the private sector can add value in reviewing existing government regulation. For example, if utilities such as electricity and water are substantially subsidized by governments, production facilities have little intrinsic incentive to adopt resource efficiency. A good understanding between the government and industry can help address such deficiencies through better regulation, to find a middle path, combining subsidies and resource efficiency.

Create a comprehensive and coherent chemical control system

Countries must design chemical control systems to clearly define, in legislation, the roles and responsibilities of both industry and government, especially with regard to information generation, dissemination and management. Conditions for placing chemicals on the market and the institutional arrangements for decision-making, and enforcement should be defined in said legislation. In addition, the points in Box 1 should be considered by production facilities in chemical management, and can be institutionalized by legislation.

Box 1: Recommendations on better chemical management in textile mills and tanneries

Recommendations – chemical safety

- It is suggested that a **formal certification**, for example, OHSAS 18000, be considered as an overarching management system for safety management and procedure.
- Frequent **training on health and safety** should be conducted. Workers should be informed of the importance of personal protective equipment usage, ideally in local languages.
- Appropriate **personal protective equipment** should be made available to the respective personnel to ensure worker safety and avoid accidents.
- **First-aid boxes** should be easily available and visible in high-risk areas like chemical stores, washing plants and whisker units.
- **Evacuation plans** should be displayed in locations such as stores (chemical stores and raw material stores), workshop areas, whiskers areas, spray booth areas, and powerhouse and boiler areas and exits. All the exits should be cleared.
- There should be an **emergency response plan** for corrective measures, corrective action, and preventive and corrective responses. In case of any chemical leakages, oil or chemical spillages and fire of chemicals or any rapid oxidation reactions of chemicals, chemical burns and corrosion, among others, a course of action should be made available and regular trainings for workers and the team leaders should be ensured. The frequency of the training should be based on the workforce understanding and workforce attrition rate. Mock drills and evaluation of performance of the trained workers during the mock drills will determine the frequency of such trainings and the personnel department should maintain such records and evaluations.
- **Safety equipment** (such as eye shower, safety shower, fire extinguishers, fire alarms and gas leak detector) should be put in place and be in working condition.
- The chemical store should have **restricted entry** and only authorized personnel who are trained in handling the chemicals should be allowed.

Box 1: (cont.)

Recommendations – chemical storage and handling

- Facilities must take note of brand directives on [ventilation and lighting](#), as specific chemicals kept in unlit rooms could pose a safety risk. Facilities could refer to OSHAS 18000 guidelines and engage brands if contradictions to brand requirements occur.
- In order to avoid the wastage of the chemicals and also reduce the chemical load and treatability of chemicals in the effluent treatment plant from chemical spills and washings of the chemicals, it is recommended that [secondary containers](#) be maintained for all liquid chemicals that are being handled. In case of solid chemicals, care should be taken to avoid any spill or cross-contamination while weighing or dispensing.

In order to reduce cross-contamination and ensure full traceability of chemicals, all primary and secondary containers should be maintained with [original labels](#) from the manufacturer. All labels should contain manufacturer name, product name in full, lot number and hazard symbols as minimum requirements. Any repacked materials should have the same information available, with printed labels.

Adopting and implementing the [Globally Harmonized System](#) of Classification and Labelling of Chemicals, including Safety Data Sheets, should be a legal obligation of doing business in a country.

Source: Siva Ramakumar Pariti,

Demonstrate legislative commitment to enforce and uphold the sustainability legislation

In many developing countries, governments already have comprehensive regulations and legislation on promoting environmental sustainability and penalizing non-compliance. However, as discussed in the preceding chapters, enforcement continues to be a challenge, mostly due to capacity constraints. In addition, lack of government commitment to uphold sustainability legislation also thwarts higher compliance. Governments should demonstrate a solid will to institute legislative impact, by airtight enforcement practices.

In India, government commitment went a long way in establishing ZLD practices in the state of Tamil Nadu. Following lukewarm action from the State Pollution Control Board, in 2011, the Madras High Court (apex judicial body in the state) ordered a shutdown of all bleaching and dyeing units in the town of Tirupur, combined with a cut in electricity supply. Reopening was conditional on the industry achieving zero liquid discharge, and a monitoring unit was set up to evaluate compliance with the court's orders. This decisive action by the judiciary concretized sustainability legislation and increased the trust of international brands in regulatory bodies. In SITA's interviews with international buyers, this case was touted as a model for government commitment.

The judicial action was effective in that the industry did try to move towards a more ZLD-based approach in its production. The industry in Tirupur also benefitted financially from the central and state governments to cover ZLD technology installation costs. However, this was limited to the Tirupur cluster and the neighbouring clusters' inability to implement ZLD technologies diluted overall efforts towards curbing pollution.

Incorporate sustainability considerations while attracting FDI – allow only up-to-date technologies and strictly adhere to international environmental requirements

Many developing countries are engaged in a race to attract FDI and with good reason. FDI is a tool in spurring economic development through employment generation, export growth and technology transfers. However, in this race, little regard is accorded to the implications of attracting FDI without a proper framework to address environmental pollution.

An environmental impact study and knowledge of appropriate international standards should be done while attracting FDI, and not retroactively. In addition, developing countries should not allow investors to install second-class or backdated technology, as subpar and obsolete technology contribute to environmental pollution in the textile and leather industries. Technology and knowledge transfers are a key aspect of FDI, and it can only work to the recipient country's benefit when this technology is up to date, commensurate with international sustainability guidelines that facilitate better compliance.

Interviews with international buyers highlighted the case of Ethiopia as a good example. As part of the stakeholder engagement sessions with the industry, the government was advised to incorporate sustainable production technologies by design in its industrial parks, taking into account resource efficiency, zero liquid discharge, waste treatment and circularity. The government saw merit in proactively installing these technologies and heeded the advice. This is crucial in attracting FDI, as the fashion industry will increasingly factor in sustainability while choosing the location of its supply chains, alongside cost considerations.

Allow multi-stakeholder engagement in drafting national standards and executing them

Active stakeholder engagement is a hallmark of responsible and effective policymaking, and environmental legislation is no different. Not only does it shed light on a multitude of insights, ideas, constraints and solutions, engaging diverse stakeholder groups in policymaking also makes implementation smoother.

In this case, among other groups, the government should consult with relevant international initiatives and organizations on sustainability, local and international experts to combine industry benchmarks with local considerations, international brands for better insight into their requirements and local manufacturers. Many international brands are actively supporting their supply chains in enhancing environmental sustainability, and this commitment from them is critical in instilling the required confidence among manufacturers, especially MSMEs, to upgrade their facilities in line with sustainability requirements. The national governments play a key role in greasing communication between diverse stakeholder groups and brokering the underlying trust.

Brands, producers and local governments can also come together and actively participate in instituting circularity. In 2019, Arvind Mills (producer) partnered with the Gap Inc. brand and the City of Ahmedabad (local civic authority) in India to create a partnership on reducing the use of freshwater in industrial processes. Gap had a commitment to recycle 10 billion litres of water by 2020, while Arvind wanted to set up a large-scale water recycling plant towards meeting its goal of eliminating freshwater as an input by

2020. Partnership with the Ahmedabad municipality allowed access to the city sewage pipelines to recycle and treat water and use it as an industrial input. This collaboration has the potential to recycle 8 million litres of city sewage daily. Such partnerships are an effective social model, as every party benefits, and can result from a robust stakeholder engagement process.

In another example, the Centre for Responsible Business (CRB) in India is spearheading a collaborative campaign called the ReFashion Hub. It aims to leverage social media to reach 5 million young, fashion-conscious consumers as well as textile bodies and manufacturers' associations in four Indian states to improve action on wastewater management. It also plans to create a textile forum constituting key stakeholders in the industry under the India Water Stewardship Network for long-term action on wastewater management. The initiative's desired impact is to involve all stakeholders along the fashion value chain in India to commit to fair fashion.¹⁹

RECOMMENDATIONS ON CAPACITY BUILDING AND AWARENESS

As highlighted in the previous chapters, brands, local manufacturers in the leather and textile sectors, as well as policymakers have concurred on the lack of technical capacity in the industry, to mainstream sustainable production practices. With the global nature of the fashion value chain, capacity constraints and information asymmetries can be easily remedied through targeted capacity building and awareness programmes for East African manufacturers and policymakers. Some international brands facilitate site visits for policymakers and manufacturers wherein they can visit compliant production facilities from the brand's supply chain to learn sustainability practices and regulation hands-on. For this to work, governments should be open to incorporate elements from efficient regulatory systems. Staff that has already been trained on sustainability should be incentivized to stay, reducing the high turnover rates among trained staff, which render the investments in capacity development untenable. Government policy should also encourage in-house research and development (R&D) on sustainable production to align productivity with easier environmental compliance.

Institute training programmes on sustainability infrastructure and practices for manufacturers and create a national pool of experts

National governments should facilitate capacity-building exercises on incorporating sustainable production practices, chemical and waste management, and resource efficiency for manufacturers. There are several international initiatives that provide targeted training, and the government should work with them in tailoring the training content to reflect the local context. Business support organizations (BSOs) should be leveraged in coordinating training for MSMEs as a group, as it might not be viable to provide individual training. The goal of these trainings should also be to facilitate the procurement of internationally acceptable certification that can be used to enter global supply chains.

19.– See <https://www.c4rb.org/refashion-hub-objective>.

It is vital to build a national pool of accredited auditors, advisers, consultants and training providers who can train and advise factory operators and managers in the implementation of cleaner production technologies and practices. This will also enable training enforcement personnel with a firm understanding of the standards, who are able to work with manufacturers in implementing the change.

Every production facility should have a point of contact for sustainability, to evaluate internal compliance with environmental standards, communicate with brands on requirements, and procure the necessary accreditation and certification while liaising with local enforcement authorities. While working with Rivatex in Kenya, SITA did just that – it established a small team to manage compliance and communicate with international buyers. While this is feasible for bigger mills, MSMEs might find the costs prohibitive to establish dedicated compliance teams. In this case, industry associations and BSOs play an important role. BSOs can have their own compliance experts who aid MSMEs in conforming to international standards.

The German Federal Ministry for Economic Cooperation and Development (BMZ) programme is a good example of industrial capacity-building programmes in developing countries through strategic partnerships. The implementation and design partners (Tchibo, Rewe, Aldi and GIZ) sought to empower factories towards better chemical control and ZDHC objectives in China and Bangladesh. As part of the programme, local consultants were trained, and manufacturing facilities were evaluated to improve wet processing to meet ZDHC and Greenpeace Detox requirements.

Institute capacity-building exercises for policymakers and sustainability inspectors

While capacity development of manufacturers is important, for enforcement to be effective, policymakers and enforcement officials also need to be capacitated adequately. As was evidenced in interviews, local legislators can benefit from training on international environmental guidelines that act as a benchmark and reference. Moreover, training enforcement officials and sustainability inspectors on the local context will enable them to work with the industry in effecting change, besides penalizing non-compliance.

Sensitize local manufacturers on international sustainability guidelines and the business benefits of compliance

SITA's interactions with local manufacturers revealed a lack of comprehensive understanding of the compliance requirements of international brands. As the leather and textile sectors grow in East Africa, on the back of concerted government commitment to capitalize on these sectors, export growth will depend on knowledge of international environmental standards. Governments, through BSOs and other industry associations, should, therefore, focus on creating a common information portal to pool these standards to increase awareness in the industry. The portals can also make use of self-evaluation tools along the lines of the Higg Index to help manufacturers assess their level of compliance and record the data for better enforcement and subsequent improvement. BSOs can also help administer targeted awareness programmes and seminars for affiliate MSMEs in the leather and textile sectors.



Image by tookapic from Pixabay.jpg

Collaborate with experts and international stakeholders on creating a sustainability curriculum mindful of the local context and constraints

To create durable impact in technical capacity geared towards environmental sustainability, modifying the curriculum in technical education is vital. A hands-on curriculum will blend in theory with best practices in sustainable production and resource efficiency while also laying out key brand requirements. This will ensure a steady stream of trained individuals ready to contribute to the greening of the East African fashion value chains. South-South exchanges and knowledge transfer is a good way to accomplish this, through memoranda of understanding between higher education institutes, to make curricula more reflective of industrial demand. While in many cases developing countries invite foreign experts to help upgrade industrial facilities and advise policymakers, these experts can also contribute to improving curricula for technical education, rendering the impact more effective and bottom-up.

Even beyond creating a coherent sustainability curriculum, as the following thought piece from The Sustainability Consortium shows, international collaborations among experts can be leveraged to produce comprehensive learning portals, which bring together training resources on wastewater management and form a community of practice.



Thought piece 2: Collaboration for wastewater treatment – a pathway to sustainability

By [Sarah E. Lewis](#), Senior Director, Innovation, The Sustainability Consortium and [Jessica Kosak](#), Manager, Technical Development, The Sustainability Consortium

Enabling future generations to live and thrive is at the heart of why creating sustainable systems is so important. The success of our businesses, our communities and the ecosystems on which we rely requires that we consider and minimize the impacts we have as we make decisions. Without this consideration, we increase our risks, the very thing that business strives to reduce. By working to better understand the Earth's systems that provide the basis of what we need to live and work, as well as the supply chains that move the products we want to make and sell, we can make decisions that are based on more visibility and more certainty. These efforts reduce the risks of losing access to supply, polluting soil, air and water, and help ensure equity and well-being throughout communities.



The Sustainability Consortium (TSC) uses science and collaboration to collectively address the sustainability challenges associated with the manufacture, use and disposal of consumer goods. TSC has created a system called THESIS that enables supply chain actors to increase visibility into their supply chains, identify the sustainability issues associated with those supply chains, and better communicate to their retail customers. This type of performance assessment provides insight into how to prioritize areas of one's supply chain where partnership might be needed to address an issue or where investment may be needed to reduce the risks associated with an issue.

One of the issues identified for many consumer goods is wastewater treatment. The International Union for Conservation of Nature (IUCN) estimates that 80% of the world's wastewater flows back into the environment without being treated or reused and it is estimated that industry accounts for at least 26% of the world's grey water footprint, meaning water that is used and then returned to a nearby catchment (Zhang et al. 2013). These numbers demonstrate that we have a big opportunity to drive change at scale by shifting the way we do business and further valuing the water that makes it possible for us to live and work.

As a result of the need to address the issue of wastewater, a group of members and partners of TSC came together to tackle this issue. The creation of the collaboration coincided with a study conducted by China Water Risk that noted three main drivers of lack of treatment by manufacturers – access to financing, training, and knowledge of how to source green chemistries. With these findings, the task force set out to create a programme to address these needs. This effort started with facilitating access to global resources, assuring that 100% of the supply chain would have access to resources related to properly treating wastewater and, as part of this, demonstrating the business incentives for taking action.

Together, the group created the Wastewater 101 Toolbox, an online database of curated wastewater resources. The toolbox enables users to find relevant information based on their role in the supply chain, their location and their topic of interest. Initially designed to focus on the textiles industry, the task force is actively expanding the scope to include all sectors of the consumer goods industry.

The Wastewater 101 Toolbox is already being used in three ways:

1. To help people start a conversation about wastewater with their customers, clients and supply chain partners;
2. To enhance their ability to tell their sustainability story to customers and clients;
3. To inform trainings and introductions to wastewater.

RECOMMENDATIONS ON CREATING AN ENABLING ENVIRONMENT

Instrumental to the success of sustainable value chains in the East African leather and textile sectors is a nurturing ecosystem that combines appropriate policy, regulatory and infrastructural support. This ecosystem must provide incentives to private industry to internalize sustainable production practice, awarding compliant manufacturers, while also make monitoring and enforcement easy and data based.

Provide appropriate financial incentives and ease access to finance

Access to finance has been identified as one of the biggest challenges to undertaking investments in sustainability. For MSMEs in particular, it is difficult to access affordable sources of financing to upgrade machinery in line with the requirements of international guidelines. National governments should work towards closing this gap in financing and assist local manufacturers towards accessing a wider variety of financing instruments like soft loans, grants, equity and development finance, etc.²⁰

Apart from funding assistance, financial incentives are instrumental towards driving the uptake of sustainable production practices. A good example is green subsidies provided to resource-efficient production facilities with a good compliance record with waste and chemical management guidelines. Similarly, commercial loans forwarded to improve environmental compliance could have favourable terms and lower interest rates.

Even for governments in East Africa, investments in physical infrastructure, to benefit from industrial clusters, safe waste disposal and common effluent treatment, are not easy to fund. Development finance from multilateral institutions, favourable credit lines from other governments and public–private partnerships are some of the viable instruments for East African governments to explore. The below thought piece lays out some solutions to ease access to financing for sustainable fashion value chains in East Africa.

20.– See a 2021 SITA report on Access to Finance for East African MSMEs. Available from <https://www.india-itme.com/elibrary/individual-research-paper/?id=784>.



Thought piece 3: Financing sustainability in the textile and apparel sector – challenges and solutions

By [Mohan Seneviratne](#), former Global Lead Textiles, International Finance Corporation.

The textile and apparel industry is one of the largest industries in the world, with annual revenue (pre-pandemic) of \$2.5 trillion and one of the largest contributors to environmental degradation.²¹ Global apparel consumption is intricately linked with rising incomes and population increase. The fashion industry's upward growth was dealt a devastating blow by the COVID-19 pandemic. McKinsey estimates that the global fashion industry's profit is expected to fall by 93%²² in the pandemic years. In this environment, improving the competitiveness of suppliers through the lens of sustainable use of resources is an even bigger challenge. International brands' primary interest is being able to purchase apparel at an affordable price without undue risk to reputation due to poor labour practices, high water and energy use, and poor chemical management.

From a supplier's perspective, one of the key challenges to sustainable improvements is financing and access to finance, especially for small and medium sized industries (MSMEs). Many MSMEs have trouble getting funding at advantageous terms to improve their competitiveness, let alone financing sustainability. Some even have trouble getting access to foreign exchange.

Financing water and energy efficiency

The textile and leather sectors' usage of water and energy resources is high. Elevated costs of electricity, diesel and energy inefficient equipment are the prime reason for this high energy use and costs in many developing countries. For an example, in Kenya, the grid electricity tariff is \$0.22 per kWh, which is four times that of Ethiopia. Moreover, grid unreliability creates the need to maintain spare generators and their operation also contributes to the production costs and greenhouse gas emissions. Within the textile apparel sector, the highest resource consumption occurs in the wet dyeing and finishing sector.

Therefore, financing schemes to promote the uptake of capital-intensive, resource-efficient equipment would go a long way to increase the industry's competitiveness, reduce energy emissions and improve the bottom lines of the suppliers. An [export development fund \(EDF\)](#) could be created by the respective central banks to fund sustainable development opportunities in the textile and leather sectors. This will offer loans to the textile sector through the financial institutions for purchasing water and energy efficient equipment at a discount to the prevailing interest rates as long as the loans are only earmarked for purchasing of such equipment such as boilers and funding water-efficient process equipment, etc.

21.– CDP (2020). «Interwoven risks, untapped opportunities». Available from <https://www.cdp.net/en/research/global-reports/interwoven-risks-untapped-opportunities>.
22.– McKinsey (1 December 2020). «*The State of Fashion 2021: In search of promise in perilous times*».

Given the importance of the \$32 billion textile and apparel sector to the economy of Bangladesh, where close to 80% of exports are from this sector, Bangladesh Bank created a Green Export Development Fund (EDF) in 2015. The GEDF is a \$500 million revolving fund intended to facilitate financing in foreign exchange for resource efficiency in the textiles and leather sector of Bangladesh. In the context of Bangladesh, high cost of diesel, unreliability of grid-connected electricity, low gas pressure, limited new gas connections, fast-declining water table and high cost of cleaning up chemicals are some of the reasons the textile and leather sector is considering resource-efficiency measures. Some of the top buyers/brands are also encouraging their suppliers to adopt resource efficiency in their production process. In this backdrop, Bangladesh Bank has committed the EDF to ensure that soft funds are available to the factories adopting resource-efficiency initiatives that will result in a reduction of energy/water/chemical costs, improvement of environment and working conditions and reduction of greenhouse gases in Bangladesh. The tenor was 5–7 years; all manufacturers were eligible, and interest rates were set at 2.5% + LIBOR (London Interbank Offered Rate).

A second option is to access the \$10 billion Green Climate Fund (GCF), the world's largest fund set up to address climate change in developing countries that aims to catalyse climate finance for low-emission equipment. In Bangladesh, the 6,000-strong ready-made garment industry is the most energy intensive industry. The energy saving potential is estimated at 1,159 tons of oil equivalent (TOE)/year. The Infrastructure Development Company Limited (IDCOL) in Bangladesh received a loan of \$150 million with a co-financing of another \$100 million to promote large-scale adoption of energy saving technologies. The GCF loan has a disbursement of 20 years and a grace period of five years.²³

However, to make the best use of these funds, domestic financial institutions need to be ready to avail themselves of these opportunities. This requires a sustained effort in creating awareness within the local financial sector on the attractiveness of going beyond vanilla envelope financing of trade opportunities. A central organization needs to be created, like the IFC's PaCT, which would be able to undertake the required training to the sector.

Green mortgages for green buildings

Globally, buildings and their operations use large amounts of resources and emit a variety of pollutants. More than half the world's resources are consumed in the construction of buildings. To mitigate the emissions from the construction and operation of buildings, green buildings are being promoted. Green buildings reduce the overall environmental impact of the built environment by conserving material resources, water, and energy use, reducing air, water and land pollution and mitigating disturbance to the local ecology and biodiversity.

The IFC estimates that the green building industry is forecast to be \$24.7 trillion by 2030.²⁴ The United States green building certification system, Leadership in Energy and Environmental Design (LEED), is the market leader. The IFC has also developed its green building certification system known as EDGE. EDGE requires that a building achieve a minimum projected reduction of 20% in energy and water use, and embodied energy in materials as benchmarked against a standard building. In the apparel sector, garment factories can be built as green buildings.

23.– Green Climate Fund (15 May 2019). «Promoting private sector investment through large scale adoption of energy saving technologies and equipment for garment sector of Bangladesh». Available from <https://www.greenclimate.fund/document/promoting-private-sector-investment-garment-sector-bangladesh>.

24.– International Finance Corporation (2019). «Green Buildings: A Financial and Policy Blueprint for Emerging Markets». Washington, DC, USA.

In Sri Lanka, leading companies like MAS, Brandix and Hirdaramani have built green buildings, with innovative features such as solar photovoltaic (PV) on rooftops, net zero emissions, hydroelectricity, compressed earth bricks, heat block paving to minimize air-conditioning usage, rainwater harvesting, wastewater recycling, LED lighting controls and extensive gardening. Brandix claims to have reduced its carbon footprint by 77%.²⁵

It is well accepted by the property industry that green buildings attract higher sale prices, stronger rents, lower vacancy rates, reduced outgoings and better returns for more sustainable buildings. Given the reduced climate risk, financial lending institutions could offer lower interest rates to promote green building uptake, which can be backed by central bank programmes to address climate change. The green building claims and proposed reduction in emissions can easily be checked using pre-set standards such as the EDGE calculator. The banks also benefit by developing a stronger real estate portfolio that is resilient to financial, regulatory and reputational risks. Many multilateral and bilateral development finance institutions such as the IFC could be interested in providing such loans to partner banks.

Box 2: Case study – ALP North Kenya.

Africa Logistics Properties in Kenya has a vision for a more sustainable warehouse industry. The company's environmentally friendly ALP North Logistics Park is the first modern Grade A logistics and distribution park in Kenya. Consisting of three warehouses with a total of 50,000 square metres of leasable space, it sits on 22 acres. By certifying its warehouses with EDGE, ALP conserves natural resources, reduces operating costs and provides a more comfortable work environment for its tenants. It has also installed solar panels and reflective paint to reduce energy use. Predicted savings are \$192,000 per year, cutting operational costs in half with energy savings of 41% and water savings of 52%.

Source: Mohan Seneviratne

Build an effective data collection infrastructure that will aid monitoring and evaluation of sustainability efforts and facilities, and inform enforcement

Availability of credible data on compliance is a cornerstone of a robust enforcement mechanism. A comprehensive platform is required for manufacturers to disclose their sustainability performance, certifications with dates of expiry and compliance status, which all stakeholders can peruse to drive accountability and transparency. This centralized platform, curated by a government body, will be a useful tool for enforcement personnel as well as international buyers in assessing manufacturing facilities for non-compliance. With poor-quality data, monitoring of production facilities against extant regulations will be a subpar, futile undertaking.

25. – Anukshi Jayasinha (26 November 2016). «Five Of Sri Lanka's Best Green Buildings», Roar Media. Available from <https://roar.media/english/life/economy/green-buildings-sri-lankas-corporates-can-keep-clean>.



(cc0) Image by Lorenzo Cafaro from Pixabay

International brands that SITA consulted concurred on the effectiveness of the monitoring model in China. In China, the local governments are extremely proactive in monitoring and recording violations to local standards on a government website. A non-governmental environmental research organization, the Institute of Public & Environmental Affairs (IPE), collects and collates the data from the government websites to create an accessible database that can be used to track environmental performance of facilities. The resulting database serves towards sustainable procurement in global and regional value chains, environmental policymaking and targeting incentives for the compliant facilities. Brands can use the database to monitor the environmental performance of suppliers in their supply chains and take appropriate action in case of violations. The IPE is a good example of data collection and use through cooperation between civil society, businesses and government. The IPE plans to expand into India and Viet Nam and will surely be a value addition in these countries' compliance infrastructure.

The following thought piece discusses the evolution of sustainability efforts in the fashion industry in wake of the COVID-19 pandemic, through better data collection, communities of practice and local expertise.



Thought piece 4: Expanding sustainability efforts in the midst of uncertainty

By Kurt Kipka, VP of Programs at the Apparel Impact Institute (Aii).

The Apparel Impact Institute (Aii) was formed in 2017 with an objective to identify, fund, scale and measure the apparel and footwear industry's proven environmental improvement solutions, focusing on energy, water and chemical reductions. Its best-known and most successful programme is Clean by Design (CbD), which uses a «best practices» methodology for facilities of any size, type or location to reduce their environmental footprint. After reaching 200+ facilities in more than a decade of implementing the programme, it has emerged as a bankable model that delivers quantifiable results.

When the realities of COVID-19 set in, the Aii had to quickly adapt to new ways of working and rapidly innovate within its programmatic approach to continue making progress. Some of the changes included coming up with creative ways to replace in-person site visits and training, and other changes meant solving how to grow and expand programming at a time of uncertainty. The Aii was not alone in facing these challenges, and other organizations can definitely benefit from what we learned during this year of change.

Expanding or starting programmes in new locations is complex and nuanced even without a global pandemic to navigate. Still, the indicators of success that the Aii has identified have only become more critical when considered in a post-COVID industry. The Aii is adapting current programmes to meet the needs of the moment and the new realities of the industry. For example, it has developed remote processes to replace in-person site visits while still maintaining high standards of partner engagement and verified results. Making these kinds of changes «in flight» is made possible with a solid programmatic foundation already established.

Establish a community of practice

One of the most important elements of building any programme is creating a support system for carrying it out. Prior to COVID-19, this work would have been accomplished in large kick-off events during small group discussions where peers could share experiences, challenges and solutions with one another. That peer-to-peer engagement is where the Aii's programme participants gain the confidence and motivation to implement their own environment projects. However, during a pandemic, these honest conversations must be facilitated virtually. Pre-webinar questionnaires that help to categorize participants into smaller groups for targeted discussions on what is most meaningful to them have been found to be particularly useful. With the changing realities of interaction, the community of practice needs to evolve accordingly.

Use local technical expertise

To be successful in implementing and sustaining quality programming, it is critical to have technical experts and engineers available and committed to supporting the work. Most importantly, the experts should be located in the programme region whenever possible. Local experts are better equipped to overcome cultural and language barriers and

adapt the programme to account for regional nuances brought on by regulations and available technology. Plus, leveraging local partners can reduce travel expenditures for a programme and, of course, during a pandemic, experts are more likely to avoid travel and physically visit a factory only if needed.

Simplify information gathering

It is impossible to begin doing good work in a new region without good data. Starting out, one can gather primary data while conducting on-site visits. Even if the intent is to use a specific tool or question set for future information gathering, personal experience can lead to a line of questioning that maximizes the quality and conformity of data collected. When site visits are not possible, in many cases, the same results are possible by starting small with a limited question set and one-on-one discussions. In doing so, one can establish the programme's goals and objectives, establish relationships and slowly build up to the level of foundational information needed to attain quality programmatic data.

Regardless of the programme, there are foundational attributes that can help ensure success. Still, perhaps the most critical of all is to align the project with organizations and people who are as passionate about the work as you are. Having a network of support enables ongoing learning and innovation necessary for adapting when challenges arise.

Earmark expenditure on physical infrastructure for sustainability and prioritize reducing environmental impact in national industrial development plans

Pre-emptive action and budgetary allocation to improve environmental compliance is cheaper and easier than retroactive action on remedying polluting production facilities, especially in the aftermath of disasters. If national budgets earmark specific costs towards making the leather and textile sectors environmentally sustainable, not only will it render the sectors competitive in an increasingly compliance-oriented international market, it will also mitigate environmental, social and economic risks from ecological degradation. Given the importance of these sectors to the East African economies and their industrial development blueprints, such a budgetary allocation is also politically sustainable.

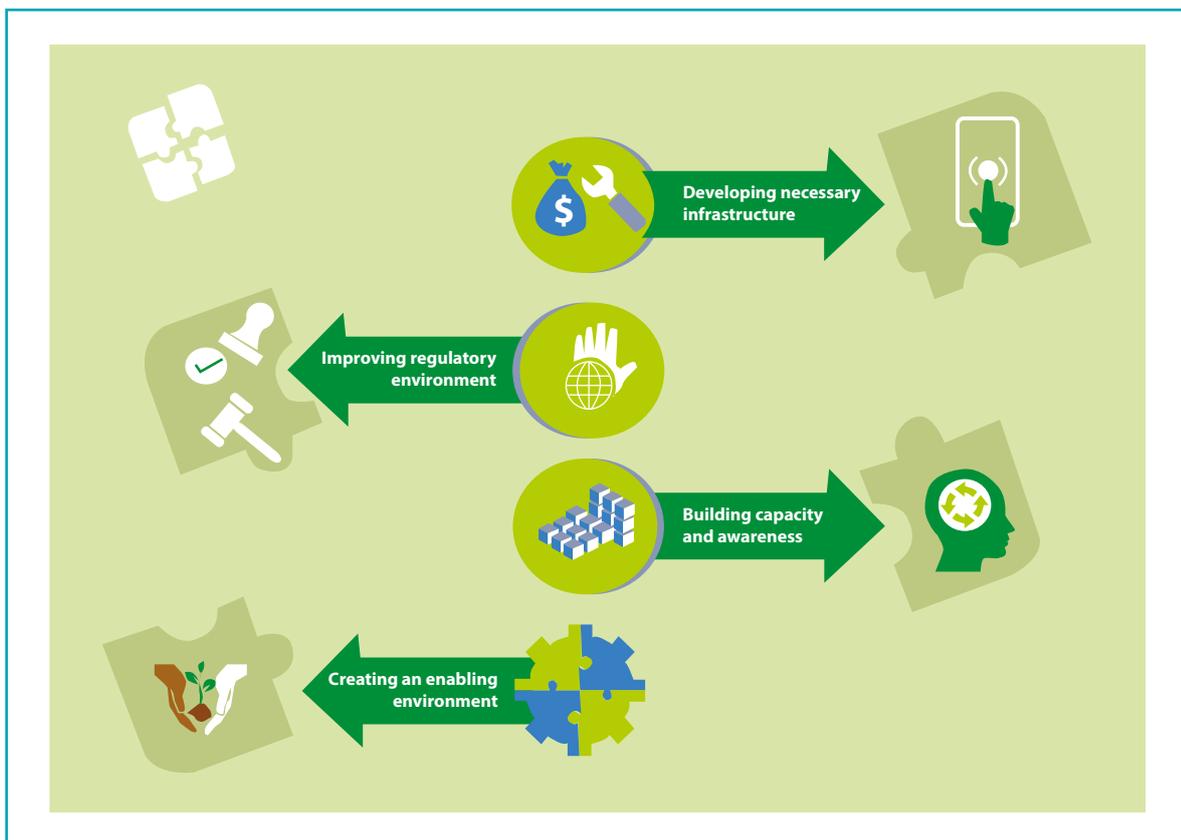
Partner with relevant international initiatives and organizations to provide a support system for MSMEs to facilitate greening

Chapter 6 discusses several international initiatives that assist manufacturing facilities, including MSMEs, with access to finance, capacity development and awareness on sustainable practices in the fashion sector. The Apparel Impact Institute (Aii) and the Partnership for Cleaner Textile (PaCT) are key examples, which help in scaling up proven solutions to improve sustainability by engaging with local stakeholders, focusing on the durability of the solution. National governments in East Africa must capitalize on these

initiatives, partnering with relevant organizations to access soft loans, development aid, grants and focused training targeted to institutionalize sustainable fashion value chains.

Another example is the European Union's InTex²⁶ project, implemented by the United Nations Environment Programme (UNEP). InTex (2020–23) is helping MSMEs and industry associations in Kenya, South Africa and the Republic of Tunisia to develop their textile value chains across sustainable dimensions, incorporating eco-innovation, circularity and life cycle approach through capacity development and policy recommendations. InTex aims to target a broad cross section of the textile sector stakeholders by incorporating discussions with policymakers on mainstreaming ecological considerations in industrial policy, and capacity development for MSMEs as well as industry associations and BSOs. It also aims to focus on fashion sector sustainability through a gender perspective, investigating hurdles endemic to women-owned businesses in the textile value chain.

Figure 9: Recommendations at a glance



Source: Authors' illustration.

26.– Innovative Business Practices and Economic Models in the Textile Value Chain (InTex). Available from <https://www.unep.org/intex>.

ANNEXES

Annex I

DESIGN CRITERIA FOR AN EFFLUENT TREATMENT PLANT

To treat this complex effluent, the effluent treatment plant should have some basic processing units before discharging in the environment. We can divide the treatment process into four steps:

1. Pre-treatment
2. Primary treatment
3. Secondary treatment
4. Tertiary treatment

PRE-TREATMENT

Before starting the treatment, raw effluent needs to go through some steps that generally fall under pre-treatment. Pre-treatment consists of the following.

Screening

A process to remove coarse particles using screening devices. Screening devices vary depending on the particle size to be removed. Some common screens used in the industries are bar screen, perforated coarse screen and rotary screens. Screens must be cleaned in a certain interval manually or mechanically.

Grit removal

Grit removal is an important stage, as raw effluent contains a high amount of fat and forms scum layers. Grit materials include sand and gravel, cotton fluff, other heavy solid materials, higher specific gravity items other than organic biodegradable solids, hair and large organic particles like food waste.

Homogenization

Equalization makes the wastewater homogenous by aeration or mechanical mixing. Retention time for homogenization depends on the treatment plant's capacity – generally 8–12 hours. Homogenization is required for the purposes of mixing effluent to achieve a stable composition and to avoid peak flow conditions.

PRIMARY TREATMENT

Primary treatment mainly focuses on reducing the biochemical oxygen demand load by 25%–50% by removing the settleable solids from the homogenized effluent by mechanical and chemical processes.

Primary treatment consists of the following.

Neutralization

Neutralization involves the step to maintain the appropriate pH for the coagulation and flocculation.

Coagulation and flocculation

Chemical coagulation and flocculation remove smaller-sized particles (colloidal matter), which will not normally be settled naturally, by using chemicals like coagulants and flocculants.

Primary clarification

Primary clarification is a process for removal of solid particulates or suspended solids from liquid for clarification and/or thickening. Clarifiers are generally settling tanks built with mechanical means for continuous removal of solids deposited by sedimentation. Sludge is being removed from the clarifiers.

SECONDARY TREATMENT

Secondary treatment mainly consists of biological treatment and clarification. Biological treatment can vary depending on the organic content of the effluent being treated. Commonly used practices include an activated sludge system, anaerobic treatment and aerobic treatment. Leather industry wastewater is rich in organic load and suitable for anaerobic treatment.

Secondary clarifier is used to remove biological sludge generated from biological treatment.

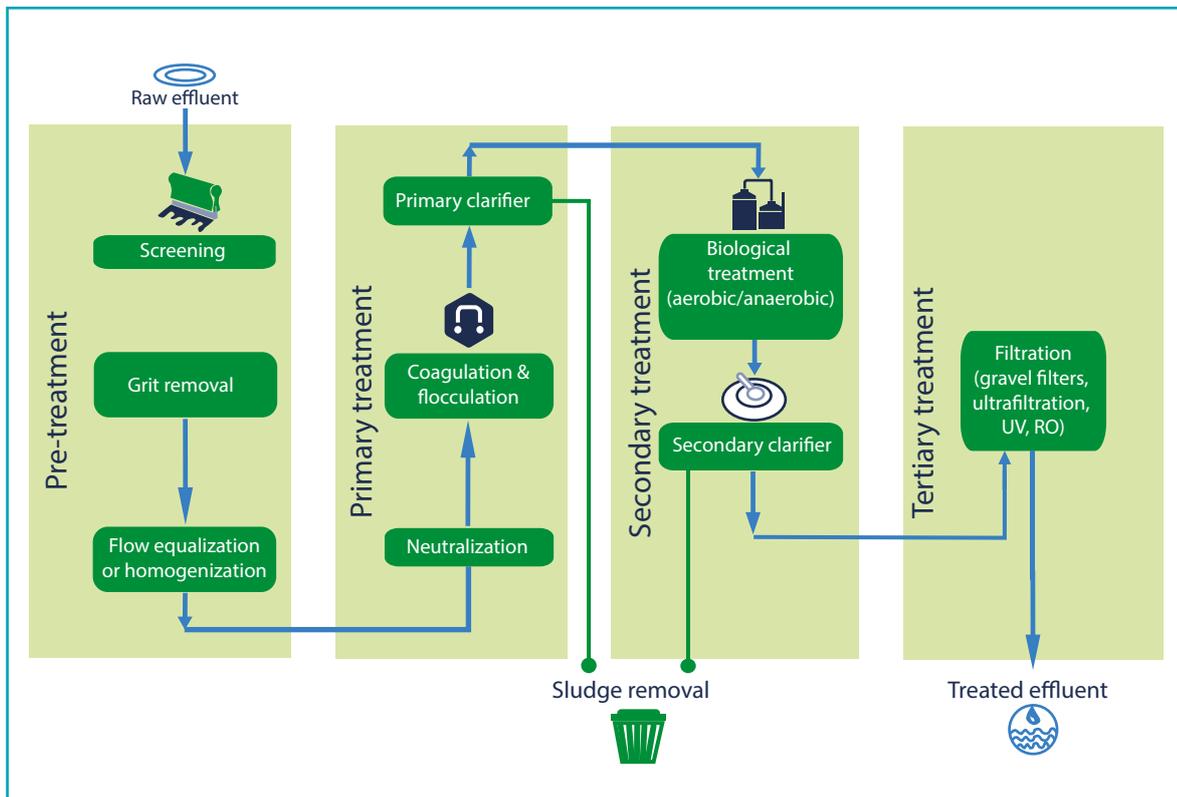


(cc) John Hogg / World Bank Photo Collection

TERTIARY TREATMENT

The tertiary process mainly includes different types of filtration processes. Filtration processes can cover gravel and sand filtration to sophisticated filtration systems like ultrafiltration and nanofiltration, etc.

Simplified diagram of an effluent treatment plant



Source: Authors' illustration.

Annex II

RECOMMENDED LIMITS FOR WASTEWATER

Selected parameters and limits of wastewater discharge regulations (on-site/direct discharge)

Parameters	Unit	United Nations Industrial Development Organization (UNIDO)		IFC	ZDHC (foundational)
		More stringent	Less stringent		
pH	Standard units (SU)	5.5–9.5	5.5–9.5	6–9	6–9
Temperature	°C	–	–	Shall not cause increase of $\geq 3^{\circ}\text{C}$	35 or $\Delta 15$
Colour	–	–	–	–	–
Total suspended solids (TSS)	Milligrams per litre (mg/L)	35	100	50	50
Total dissolved solids (TDS)	mg/L	Locally specific	Locally specific	–	–
Chemical oxygen demand (COD)	mg/L	125	250	250	150
Biochemical oxygen demand (BOD) ₅	mg/L	30	40	50	30
Total Nitrogen (N) / Kjeldahl nitrogen (TKN)	mg/L	–	–	–	20
Ammonium nitrate	mg/L	–	–	–	10
Total phosphorus (P)	mg/L	–	–	–	3
Sulphide	mg/L	1	2	1	0.5
Sulphate	mg/L	Locally specific	Locally specific	300	–
Chloride	mg/L	Locally specific	Locally specific	1,000	–
Phenol	mg/L	–	–	0.5	0.5
Oil and grease	mg/L	Locally specific	Locally specific	10	10
Coliform	Colony-forming unit (CFU)/100mL	–	–	400	400
Chromium, total	mg/L	–	–	0.5	0.2
Chromium (VI)	mg/L	–	–	0.1	0.05

The above table shows the comparison in different international organizations' guidelines regarding limit values of selected parameters.

While the United Nations Industrial Development Organization (UNIDO) has a larger range for pH value (5.5–9.5), it does not have any specific requirements regarding the temperature limit of wastewater generated. The IFC and ZDHC have similar limit values for most of the parameters tabulated, though some parameters are less or more stringent than others.

For the ZDHC conventional parameter, there are three levels – foundational, progressive, and aspirational. The table below outlines these thresholds. ZDHC's guidelines on wastewater limits are comprehensive and also contain directives on sludge limits²⁷.

The three levels of ZDHC Wastewater discharge limits

Parameters	Unit	Foundational	Progressive	Aspirational
pH	SU	5.5-9.5	6-9	6-9
Temperature	°C	max. 40 or $\Delta 3$	max. 30 or $\Delta 10$	max. 25 or $\Delta 5$
Color (436; 525; 620nm)	m-1	7; 5; 3	5; 3; 2	2; 1; 1
TSS	mg/L	150	30	10
TDS	Mg/L	3000	2500	2000
COD	mg/L	400	100	60
BOD5	mg/L	60	30	15
Total N	mg/L	100	20	10
Ammonium-N	mg/L	50	5	1
Total-P	mg/L	2	1	0.5
Sulfide	mg/L	1-5	0.5	0.2
Sulfate	mg/L	300	300	200
Chloride	mg/L	1000	800	500
Phenol	mg/L	0.5	0.3	0.1
Oil & Grease	mg/L	100	50	20
Coliform	CFU/100mL	400	100	25
Cr, Total	mg/L	2	0.5	0.4
Cr (VI)	mg/L	0.1	0.05	0.02

27.– See the ZDHC guidelines here:

[https://uploads-ssl.webflow.com/5c4065f2d6b53e08a1b03de7/5db70334bd2f007e2fbc8577_ZDHC_WastewaterGuidelines_V1.1_JUL19_compressed%20\(1\).pdf](https://uploads-ssl.webflow.com/5c4065f2d6b53e08a1b03de7/5db70334bd2f007e2fbc8577_ZDHC_WastewaterGuidelines_V1.1_JUL19_compressed%20(1).pdf)



SITA project implemented by:



International
Trade
Centre



SITA project funded by:



UKaid
from the British people